



CREATING DECENT JOBS

STRATEGIES, POLICIES, AND INSTRUMENTS

POLICY RESEARCH DOCUMENT 2

CÉLESTIN MONGA
ABEBE SHIMELES
ANDINET WOLDEMICHAEL
Editors



AFRICAN DEVELOPMENT BANK GROUP
GROUPE DE LA BANQUE AFRICAINE
DE DEVELOPPEMENT

Célestin Monga is Vice President for Economic Governance and Knowledge Management at the African Development Bank Group. He previously served as Managing Director at the United Nations Industrial Development Organization, and Senior Advisor/Director for Structural Transformation at the World Bank. He has held various board and senior positions in academia and financial services, including as a pro bono member of the advisory boards at MIT's Sloan School of Management, and Visiting Professor of Economics at Boston University, the University of Bordeaux 1, the University of Paris 1–Panthéon-Sorbonne, and Peking University.

Abebe Shimeles is Division Manager of the Macroeconomic Policy, Debt Sustainability and Forecasting, at the African Development Bank Group. With more than 30 years of experience working on development research, he is a non-resident research fellow of IZA (Institute of Labor Studies), a Research Affiliate of Southern Africa Labor and Development Research Unit, and a pro bono Resource Person at the African Economic Research Consortium.

Andinet Woldemichael is a Principal Research Economist at the African Development Bank Group. He was a postdoctoral research fellow at the University of Maryland Baltimore, an Assistant researcher at the Ethiopian Economic Policy Research Institute (an independent think tank), and a lecturer at Addis Ababa University.

CREATING DECENT JOBS

STRATEGIES, POLICIES, AND INSTRUMENTS

POLICY RESEARCH DOCUMENT 2

CÉLESTIN MONGA
ABEBE SHIMELES
ANDINET WOLDEMICHAEL
Editors



AFRICAN DEVELOPMENT BANK GROUP
GROUPE DE LA BANQUE AFRICAINE
DE DÉVELOPPEMENT

AFRICAN DEVELOPMENT BANK POLICY RESEARCH DOCUMENT 2

This report is the product of the Vice-Presidency for Economic Governance and Knowledge Management. It is part of a larger effort by the African Development Bank Group to promote knowledge and learning, share ideas, provide open access to its research, and make a contribution to development policy. The reports featured in this new Policy Research Document series are those considered to have a bearing on the Bank Group's mission and its High-5 priority areas—to Power Africa, Feed Africa, Industrialize Africa, Integrate Africa, and Improve the Living Conditions of Africans. The authors may be contacted at workingpaper@afdb.org.

Coordinator: Adeleke O. Salami

Disclaimer: The opinions expressed and arguments employed herein do not necessarily reflect the official views of the African Development Bank, its Boards of Directors, or the countries they represent. This document, as well as any data and maps included, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city, or area.

Photos from Alamy.com, iStockPhoto.com, and Shutterstock.com.

© African Development Bank 2019

ISBN 978-0-9765655-3-6

You may copy, download, or print this material for your own use, and you may include excerpts from this publication in your own documents, presentations, blogs, websites, and teaching materials, as long as the African Development Bank is suitably acknowledged as the source and copyright owner.

The team acknowledges strong support from Jennifer Blanke, Charles Lufumpa, Louis Kouakou, Anouar Chaouch, Eric Ogunleye, Amah Marie-Aude Ezanin Koffi, Tricia Baidoo, and Vivianus Ngong. Editing, translation, and layout were by a team from Communications Development Incorporated led by Bruce Ross-Larson and including Joe Brinley, Joe Caponio, Meta de Coquereaumont, Mike Crumplar, Peter Redvers-Lee, Christopher Trott, and Elaine Wilson, with design support from Debra Naylor Design and translation support from Jean-Paul Dailly and a team at JPD Systems.

WITH CONTRIBUTIONS FROM

AFRICAN DEVELOPMENT BANK

Célestin Monga
Abebe Shimeles
Andinet Woldemichael
Kapil Kapoor
Hassanatu Mansaray
Laura Sennett
Oscar Pitti Rivera
Antonio Ocana
Tapera Jeffrey Muzira
Uyoyo Edosio
Ilyes Bdioui
Rosemond Offei-Awuku
Grace Vhuya Obeda
Edson Rurangwa Mpyisi
Absa Ndeye Gningue
Eric Ogunleye
Davina Osei (and Maastricht University)

OTHER CONTRIBUTORS

Gary S. Fields, *Cornell University*
Nobuya Haraguchi, *UNIDO*
Margaret Jodlowski, *Cornell University*
Junior Davis, *UNCTAD*
Jane Muthumbi, *UNCTAD*
Stephen S. Golub, *Swarthmore College*
Ahmadou Aly Mbaye, *Cheikh Anta Diop University*
Laura Chen, *Swarthmore College*
Fatou Gueye, *Cheikh Anta Diop University*
Jorge Luis Tello Garza, *Swarthmore College*
Mustapha Kamel Nabli, *North Africa Bureau of Economic Studies*
Brahima Sangafowa Coulibaly, *Brookings Institution*
Luc Christianensen, *World Bank*
Arabo Ewinyu, *University of Cape Town*
Mumbi Kimani, *University of Cape Town*
Morné Oosthuizen, *University of Cape Town*
Christopher Rooney, *University of Cape Town*
Francois Steenkamp, *University of Cape Town*
Derek Yu, *University of the Western Cape and University of Cape Town*
Klaus Schwab, *World Economic Forum*
Dani Rodrik, *Harvard University*
Charles Sabel, *Columbia University*
Njuguna Ndung'u, *African Economic Research Consortium*

CONTENTS

From the President xi

1 **Jobs: An African manifesto** 1

<p>The unique features of Africa’s labor markets 2</p> <p>Traditional and (mostly) ineffective remedies to unemployment 8</p> <p>Job creation through new forms of industrialization 9</p> <p>Prudent macroeconomic policies to support employment 20</p> <p>Public works funded in part by regional development banks 23</p> <p>Building clusters through industrial parks and special economic zones 27</p> <p>Building skill enhancement zones for capacity development 31</p> <p>Well-targeted apprenticeship and job training programs 33</p> <p>Annex 39</p> <p>Notes 41</p> <p>References 43</p> <p>Boxes</p> <p>1 ILO definitions 3</p> <p>2 Greening African industrialization 10</p> <p>3 Can services create enough decent jobs in Africa? 13</p> <p>4 Employment opportunities in creative industries 16</p>	<p>5 The Fourth Industrial Revolution: What it means, how to respond 21</p> <p>6 Public debt for employment-generating infrastructure? 24</p> <p>7 Prioritizing the many constraints to job creation and growth 29</p> <p>8 Enhancing skills for agro-industrialization and entrepreneurship 35</p> <p>9 Should Africa worry about a brain drain? Probably not, but... 37</p> <p>Figures</p> <p>1 Rates of unemployment and vulnerable employment, 2018 4</p> <p>2 Sectoral distribution of employment in Africa, 2018 6</p> <p>3 Population by age groups and sex 8</p> <p>4 Job opportunities in various industries 19</p> <p>5 Out-of-school rate by region and age group, 2016 34</p> <p>Table</p> <p>1 Participation rates in North Africa in 2018 6</p>
---	---

Focus 1 **An industrial policy for good jobs** 48

Focus 2 **Can agriculture create job opportunities for youth?** 50

Focus 3 **Policies to foster Africa’s digital transformation and create ICT jobs** 52

PART 1 AFRICAN LABOR MARKETS: FEATURES AND DYNAMICS

2 **Confronting Africa’s employment problem** 57

<p>Introduction 57</p> <p>Main features of African labor markets 59</p> <p>Policy interventions for better labor market outcomes 66</p> <p>Notes 72</p> <p>References 73</p> <p>Boxes</p> <p>1 Basic labor market concepts: Labor markets, employment, unemployment, and earnings 58</p>	<p>2 Gender, informality, and poverty 65</p> <p>Figures</p> <p>1 The structure of employment and unemployment in Mozambique 60</p> <p>2 In Sub-Saharan Africa, most workers are self-employed in family farms or household enterprises 61</p> <p>3 Relationship between the composition of the labor force and economic development 62</p>
---	---

4 Unemployment and informality are inversely related in Africa, 2014

Tables

64	1 Global distribution of workers by region, income level, and employment category, 2013	61
	2 Agricultural and non-agricultural employment in Sub-Saharan Africa and other regions of the world	63

Focus 4

Manufacturing employment in African countries

76

3

The cost of inaction: obstacles and lost jobs in Africa

81

Introduction	81	4 Distribution of firm size	86
Firm productivity and job creation	82	5 Biggest obstacle	87
The World Bank enterprise survey	83		
Econometric analysis	87	Tables	
Notes	90	1 The number of firms at risk, exited, and survived, by country	84
Conclusion	90	2 Firm characteristics by exit status	87
References	91	3 Two-part estimation of the impacts of the biggest obstacles on employment growth	88
Annex	93	4 Two-part estimation of the impacts of objective obstacles	89
		5 Predicted decline in annual employment growth due to a specific obstacle	89
Figures			
1 Annual firm exit rates	85		
2 Probability of exit by firm age	85		
3 Annual employment growth, latest wave	85		

Focus 5

The “missing women” in African labor markets

94

4

Labor market flexibility and jobs in four African countries

99

Introduction	99	6 Age, locale, marital status, and educational level of individuals born between 1936 and 1985, Ethiopia	106
Access to formal and informal employment	101	7 Sectoral employment of workers born between 1936 and 1985, Ethiopia (percent)	106
Data and descriptive results	102	8 Age, locale, marital status, and educational level of individuals born between 1936 and 1985, Nigeria	107
Empirical methods	111	9 Labor market participation status, Nigeria, 2006–15 (percent)	108
Results and discussions	111	10 Sectoral composition of workers born between 1936 and 1985, Nigeria (percent)	109
Conclusion and policy recommendations	127	11 Labor market participation rates, South Africa (percent)	109
Notes	129	12 Age, locale, marital status, and educational level of individuals born between 1936 and 1985, South Africa (percent)	110
References	130	13 Sectoral composition of workers born between 1936 and 1985, South Africa (percent)	110
Annex		14 Transition matrices: Broader labor market statuses	112
Empirical methods	133	15 Transition matrices: Detailed labor market statuses	114
		16 Dynamic random effects estimation of labor market entry and exit: Egypt	115
Figures		17 Dynamic random effects estimation of labor market entry and exit: Ethiopia	116
1 Shorrocks mobility indices	113	18 Dynamic random effects estimation of labor market entry and exit: Nigeria	116
Figure A1 Number of individuals in each birth year–gender–education cell, by country	133		
Tables			
1 Surveys—years, countries, and numbers	103		
2 Labor market participation, Egypt (percent)	104		
3 Age, locale, marital status, and educational level of individuals born between 1936 and 1985, Egypt	104		
4 Sectoral employment of workers born between 1936 and 1985, Egypt (percent)	105		
5 Labor market participation status, Ethiopia	105		

19 Dynamic random effects estimation of labor market entry and exit: South Africa	117	29 Dynamic random effects estimation of mobility between self-employment and wage/salary employment: South Africa	124
20 Dynamic random effects estimation of labor market entry and exit: Pooled	118	30 Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Pooled	124
21 Dynamic random effects estimation of mobility between employment and unemployment: Egypt	119	31 Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Egypt	125
22 Dynamic random effects estimation of mobility between employment and unemployment: Ethiopia	119	32 Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Ethiopia	125
23 Dynamic random effects estimation of mobility between employment and unemployment: Nigeria	120	33 Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Nigeria	126
24 Dynamic random effects estimation of mobility between employment and unemployment: South Africa	120	34 Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: South Africa	126
25 Dynamic random effects estimation of mobility between employment and unemployment: Pooled	121	35 Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Pooled	127
26 Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Egypt	122		
27 Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Ethiopia	123		
28 Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Nigeria	123		

5 Human capital, productivity, and structural transformation

137

Slow structural transformation in Africa	137	7 Trade and government sector shares of employment in the services sector, by African country, 2010	142
Aim of this study	139	8 Trends in the relative productivity of agriculture, by region, 1960–2010	142
Employment and productivity patterns	139	9 Percentage change in the relative productivity of agriculture, by region, 1960–2010	143
Slow structural transformation amid persistent productivity gap	144	10 Relative productivity of agriculture, by African country, 2010	143
The role of human capital	146	11 Labor productivity of nonagriculture subsectors relative to labor productivity in agriculture, 2010	144
Notes	152	12 The contribution of structural change to economy-wide labor productivity growth varied considerably by country but was low in most countries, 2000–10	145
References	152	13 Labor productivity growth decomposition in the services and industry sectors, 2000–10	146
Annex	154	14 The relationship between labor productivity growth and human capital	147
Figures		A1 Labor productivity in agriculture relative to nonagriculture sectors, 1960–2010	154
1 Agriculture's share in employment remains higher in Africa than in other regions, 1990, 2000, 2005, and 2010	139	A2 Trends in average annual economy-wide labor productivity growth due to structural transformation, 1960–2010	155
2 Agriculture's share in employment has been declining much more slowly in Africa than in other regions, 1965–2010	140	A3 Average labor productivity growth decomposition, by country, 2000–10	156
3 The sectoral share of employment varies in African countries, though agriculture predominates in most countries, 2010	140	A4 Trends in the share of industry in total employment, 2000–10	157
4 Within industry, construction employment shares have been rising in Africa while manufacturing shares have been falling, 1960–2010	141	A5 Trends in the Human Capital Index, 1960–2010	158
5 Manufacturing and construction shares of employment in the industry sector, by African country, 2010	141		
6 Trade continues to have the largest employment share within the services sector in Africa, 1960–2010	141		

A6	Human Capital Index for African countries, 2010 or latest available	158	3b	Simple ordinary least squares regression of economy-wide labor productivity growth, by region, 1970–2010	149
Tables					
1	Decomposition of annual labor productivity growth, by country and period, 1960–2010	145	4a	Simple ordinary least squares regression of within-sector labor productivity growth, pooled sample, 1970–2010	150
2a	Simple ordinary least squares regression of growth in relative productivity of agriculture, pooled sample, 1970–2010	148	4b	Simple ordinary least squares regression of within-sector labor productivity growth, by region, 1970–2010	150
2b	Simple ordinary least squares regression of growth in relative productivity of agriculture, by region, 1970–2010	148	5a	Simple ordinary least squares regression of rate of structural transformation, pooled sample, 1970–2010	151
3a	Simple ordinary least squares regression of economy-wide labor productivity growth, pooled sample, 1970–2010	149	5b	Simple ordinary least squares regression of rate of structural transformation, by region, 1970–2010	151
			A1	Full list of countries in the GGDC Database	156

6 Intra-African migration, job creation, and transformation 161

Drivers of economic migration in Africa	161	2	Personal and household determinants of migration in Ethiopia and Zimbabwe	164
Migration and job creation in agriculture, manufacturing, and services	166	Tables		
Policy recommendations	169	1	Intraregional and interregional migration receiving countries for selected sending countries	163
Conclusion	170	2	Share of migrants in highly skilled occupations in sending and receiving countries (percent)	164
Notes	170	3	Share of migrants in low-skilled occupations in sending and receiving countries (percent)	165
References	171	Figures		
		1	International migration corridors in Eastern, Southern, and Western Africa	162

PART 2 NEW CHALLENGES AND NEW OPPORTUNITIES

7 Constraints to employment creation in Africa 177

Introduction	177	Figures			
The prevalence of informal and precarious employment in Africa	178	1	Population growth in African focus countries	182	
Is labor supply constraining employment creation in Africa?	182	2	Population growth in comparator countries	182	
Increasing labor demand in Africa	184	3	Male literacy rates in African focus countries	183	
Country case analyses: The five African focus countries	201	4	Male literacy rates in comparator countries	183	
Conclusions and policy recommendations	214	5	Female literacy rates in five African focus countries	183	
Annex	217	6	Female literacy rates in comparator countries	183	
Notes	218	7	Share of firms identifying corruption as a major constraint in African focus countries and comparator countries	188	
References	220	8	Reliable access to electricity in African focus countries and comparator countries	191	
Boxes					
1	The garment industry in Bangladesh	189	9	Share of firms identifying labor regulation as a major constraint in African focus countries and comparator countries	191
2	History of export processing zones	194	10	Annualized minimum wage in African focus countries and comparator countries, 2018	192
3	Mauritius and Senegal: Success and failure with export processing zones	196			
4	Ethiopia's adaptation of China's model	198			

11	Minimum wage as a share of GDP per capita in African focus countries and comparator countries, 2008–18	192	10	World Bank Doing Business overall ranking in African focus countries and comparator countries, 2008 and 2018	187
12	Time to export and import across borders in African focus countries and comparator countries, 2018	193	11	Enforcing Contracts overall ranking in African focus countries and comparator countries, 2008 and 2018	188
13	Senegal's world market share of exports of green groundnuts and groundnut oil, 1962–2016	202	12	Indexes and rank of labor market regulation in African focus countries and comparator countries, 2015	191
14	Senegal's fishing exports, 1962–2016	203	13	Trading across Borders overall ranking in African focus countries and comparator countries, 2008 and 2018	192
15	Senegal manufactured exports, 1962–2016	203	2	Urban informal employment in four African focus countries	179
16	Senegal's exports of labor-intensive manufactured goods, 1962–2016	203	3	Vulnerable employment plus unemployment in African focus countries	180
17	Senegal's exports of fruits and vegetables, 1962–2016	204	4	Female vulnerable employment in African focus countries	181
18	Ethiopia manufacturing exports, 1962–2014	206	5	Vulnerable employment and unemployment in comparator countries	181
19	Ethiopian exports of leather, footwear, textiles, and clothing, 1962–2014	206	6	Average monthly incomes in urban formal and informal sectors in African focus countries, around 2015	181
20	Ethiopia exports of cut flowers and vegetables, 1962–2014	206	7	Poverty rates in African focus countries and comparator countries	182
21	Benin's share of world cotton exports, 1962–2016	208	8	Labor force participation, unemployment, and nonemployment in African focus countries	186
22	Share of edible nuts in Benin's export value, 1962–2016	209	9	Labor force participation, unemployment, and nonemployment in two comparator countries	187
23	Burkina Faso's share of world cotton exports, 1962–2014	210			
24	Value of Burkina Faso exports of fruits of vegetables, 1962–2014	210			
25	Ghana's share of the world cocoa market, 1962–2016	213			
26	Ghana's exports of fruits and vegetables, 1962–2012	213			
1	Distribution of employment by sector in selected Sub-Saharan low-income countries	179			

Focus 6

Selected programs and tools for youth employment from the African Development Bank

227

8 How many jobs does Africa need to create?

233

Introduction	233	4	Projected working age population growth and share of working age population in Africa by country, 2013–63	237	
Global and regional population trends	234				
Economic dependency and demographic dividends	238	5	Total dependency ratio by global region, 1990–2065	238	
Youth and the labor market	244	6	Child dependency ratios by global region, 1990–2065	239	
Policy recommendations	263	7	Elderly dependency ratio by global region, 1990–2065	239	
Notes	265	8	Demographic window of opportunity for African regions and countries, 1990–2100	241	
References	266	9	Labor income and consumption across the lifecycle, median profiles for 21 African countries with National Transfer Accounts data for 2017	242	
Annex 1	268	10	Simulated first demographic dividend by region in Africa, 1993–2063	243	
Annex 2	270	11	Ratio of youth to older worker median monthly wages in five African countries, latest year available	254	
Figures		A1.1	African population and working age population projections, three projection variants, 1990–2100	269	
1	Global distribution of the working age population, 1963, 2013, and 2063				
2	The growth rate of the working age population is projected to differ considerably by region in Africa, 2013–63	236	A1.2	African population, working age, and youth population projections, 1993–2063	269
3	There is a negative relationship between GDP per capita and projected working age population growth in African countries and regions, 2013–63	236			

A1.3	Simulated first demographic dividend, by global region, 1993–2063	8	269	Conditions of employment in four African countries, latest year available	253
A2.1	Working age cohorts as a share of total working age population in Nigeria, by age group, 2013–63	9	271	Ratio of youth to older worker median monthly wages in five African countries, by gender, education level, and urban or rural locale, latest year available	255
A2.2	Working age cohorts as a share of total working age population in Democratic Republic of the Congo, by age group, 2013–63	10	272	Ratio of youth to older worker median monthly wages in five African countries, by industry, occupation, and sector, latest year available	257
A2.3	Working age cohorts as a share of total working age population in Ethiopia, by age group, 2013–63	11	274	Determinants of labor market participation and employment in five Africa countries, 2013–63	259
A2.4	Working age cohorts as a share of total working age population in Tanzania, by age group, 2013–63	12	275	Expected demographic change and the labor market in Africa, by region, 2016–63	262
A2.5	Working age cohorts as a share of total working age population in Uganda, by age group, 2013–63	A1.1	276	Population projections, by global region and decade, 2013–63 (millions)	268
A2.6	Working age cohorts as a share of total working age population in Egypt, by age group, 2013–63	A1.2	277	Working age population projections, by global region and decade, 2013–63 (millions)	268
A2.7	Working age cohorts as a share of total working age population in Angola, by age group, 2013–63	A1.3	279	Working age population projections, by global region and youth and non-youth age groups, 2013 and 2063 (millions)	268
Tables					
1	Projected global population trends, by region, 2013–63 (millions)	A2.1	235	Projected population change in Nigeria, by age group, 2013–63	270
2	Youth labor market profiles of five African countries, most recent year available	A2.2	246	Projected population change in Democratic Republic of the Congo, by age group, 2013–63	272
3	Employment shares across selected individual characteristics in five African countries, latest available years	A2.3	247	Projected population change in Ethiopia, by age group, 2013–63	273
4	Employment type and sector in five African countries, latest year available (percent)	A2.4	249	Projected population change in Tanzania, by age group, 2013–63	274
5	Employment by sectors in five African countries, latest year available	A2.5	251	Projected population change in Uganda, by age group, 2013–63	276
6	Employment across skilled and unskilled occupations in five African countries, latest year available	A2.6	251	Projected population change in Egypt, by age group, 2013–63	277
7	Employment across formal and informal sectors in four African countries, latest year available	A2.7	252	Projected population change in Angola, by age group, 2013–63	278

Focus 7
Encouraging start-ups in Tunisia’s new technologies industry **280**

9
The greatest migration challenge of all time? **283**

Introduction	283	Figures	
Demographic and income differentials in Sub-Saharan Africa and Europe	284	1	Growth of the working age population in Sub-Saharan far outpaces that in other regions, 1980–2050 (overlapping 30-year increases, calculated every 5 years)
Supply and demand for skills and migration	286	2	Working age population and labor force demographics diverge starkly between Sub-Saharan Africa and Europe, 1990–2050
Pressures for emigration within and outside of Africa	291	3	Projections of changes in GDP per capita in Sub-Saharan Africa and advanced countries show a widening of the differential between 2015 and 2050
The special challenges of the Sahel	292		
Policy implications	293		
Notes	294		
References	295		

Tables		
1 Share of population with completed secondary and tertiary education in Asia and Middle East and North Africa, 1985 and 2010 (percent)	287	
2 Unemployment rates for people with completed advanced and intermediate education in Asia and the Middle East and North Africa, 2010 or closest year	288	
		3 Percentage of population in Sub-Saharan Africa with secondary and tertiary education degrees, 1985 and 2010 289
		4 Unemployment rates for people with completed advanced and intermediate education in Sub-Saharan Africa, 2010 or closest year (percent) 290
		5 Stock of emigrants from Sub-Saharan Africa countries, 2000–17 291

10 Fourth Industrial Revolution, jobs, and skills 297

About the Fourth Industrial Revolution	297	8 Estimated reading proficiency among youth 15–24, by region, 2017 309
Labor force challenges and the 4IR	301	9 Learner-to-computer ratio, primary and secondary education, 2013 311
Awareness and preparedness for the 4IR ecosystem	304	10 Education levels with courses in basic computing skills, selected Sub-Saharan African countries, 2013 312
4IR ecosystem	306	11 Internet penetration rates (IPR) 312
Inclusive transformation strategies	315	12 Tech hubs in Africa 314
Annex	321	13 Evolution of automation economics in Kenya for furniture industry 318
Notes	326	A1 Share of productive jobs in total new jobs, by elasticity 322
References	328	A2 Changes in the quantity and quality of jobs depending on the scenario 324
Abbreviations	332	A3 The labor force as a share of the working age population increases as the inactive become employed 325

Boxes

1 The four drivers of industrial revolutions	298
2 Modeling the impact of 4IR on Africa's labor market landscape	303
3 Examples of technology hubs—Rwanda and Kenya	315
4 Malawi: Blockchain certifying food safety	317

Figures

1 The 4IR ecosystem	300
2 Awareness of 4IR technologies	305
3 Current and planned deployment of 4IR technologies	305
4 Perceived impact of 4IR on jobs	307
5 Preparedness for 4IR technologies	307
6 Business preparedness for 4IR	308
7 Education system preparedness	309

Tables

1 Examples of current and planned deployment of 4IR technologies	306
A1 Finding fixed values for predictor variables	323
A2 Changes in employment, productive employment, and working poor using 2017 baseline data (CAGR)	324
A3 Summary of the simulated values obtained in 2022 under the different scenarios	325

11 Strategies for jobs in the digital age 335

Introduction	335	Figures
Dynamic adjustment or job destruction?	335	1 Average risk of automation for the 20 lowest risk and 20 highest risk industries, 2018 336
Labor-saving technologies may compound Africa's job creation challenge	336	2 Kenya's furniture manufacturing industry has about 25 years before it becomes more profitable to substitute robots for labor 337
But other aspects of automation and digitization are creating unprecedented opportunities for employment and inclusive growth in Africa	337	3 The average internet penetration rate is low in Africa, but there is wide variation, 2017 338
Harnessing the benefits and managing the challenges	338	4 Tax revenue, tax capacity, and efficiency in Sub-Saharan Africa 340
Notes	341	
References	341	

Focus 8 Digitization for job creation and inclusive growth 343

FROM THE PRESIDENT



“Africa’s greatest asset is its youthful population. Africa’s youth population, currently estimated at 250 million, is expected to rise to 840 million by 2050. That’ll make Africa the youngest continent in the world, as many parts of the world are witnessing rapidly aging populations.

What we do with that population of youth today will determine the future of work in the world. Africa must become the brimming workshop of the world—with a knowledgeable and highly skilled workforce that’s able to propel the continent into the fourth industrial revolution.

Today, millions of these same young people have no jobs and many take enormous risks to cross the Mediterranean to seek a brighter future in Europe. I do not believe that the future of Africa’s youth lies in Europe; their future must lie in a thriving and more prosperous Africa.

Our challenge is to ensure that Africa’s economies grow more rapidly and in ways that create quality jobs for its teeming youths. Africa must arise and pull itself up, and develop with pride. For there’s no pride in massive unemployment of youths. There’s no pride in seeing thousands drown on turbulent waters of the Mediterranean. That’s why the African Development Bank is pursuing a major *Jobs for Youth in Africa* initiative to help African countries create 25 million jobs for its youth.”

Dr. Akinwumi A. Adesina

President, Africa Development Bank Group

Excerpts of remarks, Seoul, 9 February 2019



JOBS: AN AFRICAN MANIFESTO

Célestin Monga

African Development Bank

 @CelestinMonga


A group of people wearing masks had just disrupted a baseball game by running completely naked across the field. After security chased them out, legendary Yankee catcher Yogi Berra was asked whether these naughty characters were men or women. He replied: “I don’t know. They had bags over their heads!” That story illustrates what is perhaps the biggest issue in development economics today: the inability of many researchers to look in the right place when searching for answers.

Looking at the wrong place has certainly been a major impediment in the search for solutions to Africa’s economic development.¹ Yes, there are ongoing stimulating debates about the continent’s economic future. Yet, despite the optimism, there are serious concerns. Important players still appear confused about what development strategies and policy interventions to recommend to these low- and medium-income countries. It is painful to sit in some high-level meetings in African capital cities and observe foreign experts trying to assess whether the government had provided enough funding to “priority sectors” (often defined very broadly as agriculture, education, health, and infrastructure) to justify more external financing. It is equally frustrating to see these well-meaning people attempt to reach definitive conclusions about whether things were going in the right direction by analyzing the number of

reforms carried out to “improve the business environment.” Watching them search for answers, one cannot help but think of Berra’s comment.

Vague notions of reform in developing countries are meaningless. What does a budget increase for the agriculture ministry reveal, exactly? A minister might simply have purchased a few more expensive cars for his staff, or his personal ranch. Why expect any low-income country with limited administrative capacity to simultaneously improve all the many “doing business” indicators every year? It is unrealistic to recommend an overwhelming and generic laundry list of reforms that no government has the capacity to achieve. (By the way, China and Vietnam, which have been among the world’s top-performing countries for the past 20 years, are consistently ranked quite low on the ease of doing business).²

Unfortunately, development economics has not always been a trustworthy source for policy-makers who need a concrete blueprint for action. Decades of paradigm shifts—from state-centered strategies with grandiose project financing (interventionist policies) in the 1960s and 1970s, to structural adjustment (*laissez-faire*) in the 1980s and 1990s—have led to intellectual confusion and random economic policy. As a result, Africa has been going through profound sociopolitical



disruptions, which makes the difficult but necessary economic reforms even more challenging to design and implement properly.³

In the face of rapidly growing populations and heightened risks of social unrest or discontent, job-less growth is the most serious concern for African policymakers. Heads of state of African and developing countries, even those with great vision and good leadership skills, are desperately searching for more specific ways to generate growth and create jobs. The basic recipe for economic prosperity seems straightforward: Sustainable and inclusive growth requires constant increases in labor productivity, which in turn implies the use of the best technology one can afford and use, and the development of new sectors and industries that can absorb the latest possible segments of the labor force with its existing levels of skills. The main way for growth to improve living standards and reduce poverty rates is through rising labor incomes in modern sectors where skill development and technological learning promote more productivity growth.⁴

In the African context, the primary goal of an effective growth-enhancing, job-creating strategy should be to lift the 80–90 percent of people now in low-productivity or subsistence activities into industry, including agro-industrial business and some new tradable services. Manufacturing provides more long-term economic benefits than other activities. It generates economies of scale, sparks industrial and technological upgrading, fosters innovation, and has big multiplier effects, with each factory requiring accountants, marketing people, component suppliers, restaurants, and other services.

To stimulate such structural transformation and create decent employment for large segments of the labor force, two main obstacles must be overcome: high factor costs (often due to bad regulations and rigidities in land policy) and high transaction costs (often due to poor infrastructure and weak governance). Policymakers need to recognize that their meager government budgets and administrative capacity must be allocated not to generic, broad-based reforms or to vaguely defined “priority

sectors,” but to an initial small number of strategically targeted programs, reforms, and industries in which private firms can emerge and become competitive domestically and internationally, and create strong demand for formal sector employment.

In a globalized world, firms must cluster in sectors consistent with their country’s comparative advantage (that is how they can lower both production and transaction costs). By facilitating the clustering of competitive private firms in some geographic locations with excellent logistics (without using the distortionary instruments of old industrial policies such as tariffs or other forms of heavy protection), governments working closely with and often inspired by private sector organizations, academic institutions, and civil society can foster the backward and forward linkages that will bring capital and knowledge to national economies. That is the general framework articulated in this introductory study. While the framework relies primarily on market mechanisms and the use of transparent, targeted, and temporary incentive systems, it rejects the naïve and ineffective notion that economic policies can be left to chance and randomness. It is also the blueprint used to achieve economic prosperity by all of today’s developed economies, and by the developing countries that have successfully addressed unemployment and underemployment.

The study is organized around the discussion of four questions: What are some of the key features and trends in Africa’s labor markets? Why have traditional strategies and policies to tackle unemployment and underemployment been ineffective? What macroeconomic policies should be followed to boost employment on the continent? And what strategies, institutions, and instruments are most effective in the quest for decent jobs?

THE UNIQUE FEATURES OF AFRICA’S LABOR MARKETS

Why are economists and policymakers often looking at the wrong place when it comes to searching for the cure to unemployment and underemployment?

BOX 1

ILO definitions

Unemployment

Persons unemployed are all those of working age who were not in employment, carried out activities to seek employment during a specified recent period, and were currently available to take up employment given a job opportunity. The unemployment rate expresses the number of unemployed as a percentage of the labor force.

Employment

Persons in employment are all those of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. They comprise employed persons “at work” (who worked in a job for at least one hour) and employed persons “not at work” due to temporary absence from a job or to working-time arrangements (such as shift work, flex time, and compensatory leave for overtime). The employment rate is also known formally as the employment-to-population ratio and expresses the number of persons employed as a percentage of the total working-age (15+) population.

Employers

Employers are those workers who, working on their own account or with one or a few partners, hold the type of jobs defined as a “self-employment jobs” (where the remuneration is directly dependent upon the profits derived from the goods and services produced), and, in this capacity, have engaged, on a continuous basis, one or more persons to work for them as employee(s).

Own-account workers

Own-account workers are workers who, working on their own account or with one or more partners, hold the type of jobs defined as a “self-employment jobs,” and have not engaged any employees to work for them on a continuous basis. Members of producers’ cooperatives are workers who hold “self-employment jobs” in a cooperative producing goods and services. The rate of own-account workers is the share of own-account workers in total employment.

Labor force

The labor force comprises all persons of working age who furnish the supply of labor for the production of goods and

services during a specified time-reference period. It refers to the sum of all persons of working age who are employed and those who are unemployed. The labor force participation rate expresses the labor force as a percentage of the working-age population.

Employees

Employees are all those workers who hold paid employment jobs, where the incumbents hold employment contracts that give them a basic remuneration not directly dependent upon the revenue of the unit they work for.

Persons outside the labor force

Persons outside the labor force comprise all persons of working age who, during the specified reference period, were not in the labor force (that is, were not employed or unemployed). The working-age population is commonly defined as persons aged 15 years and older, but this varies from country to country. In addition to using a minimum age threshold, certain countries also apply a maximum age limit. The rate of persons outside the labor force (neither employed or unemployed) is expressed as a percentage of the working-age population.

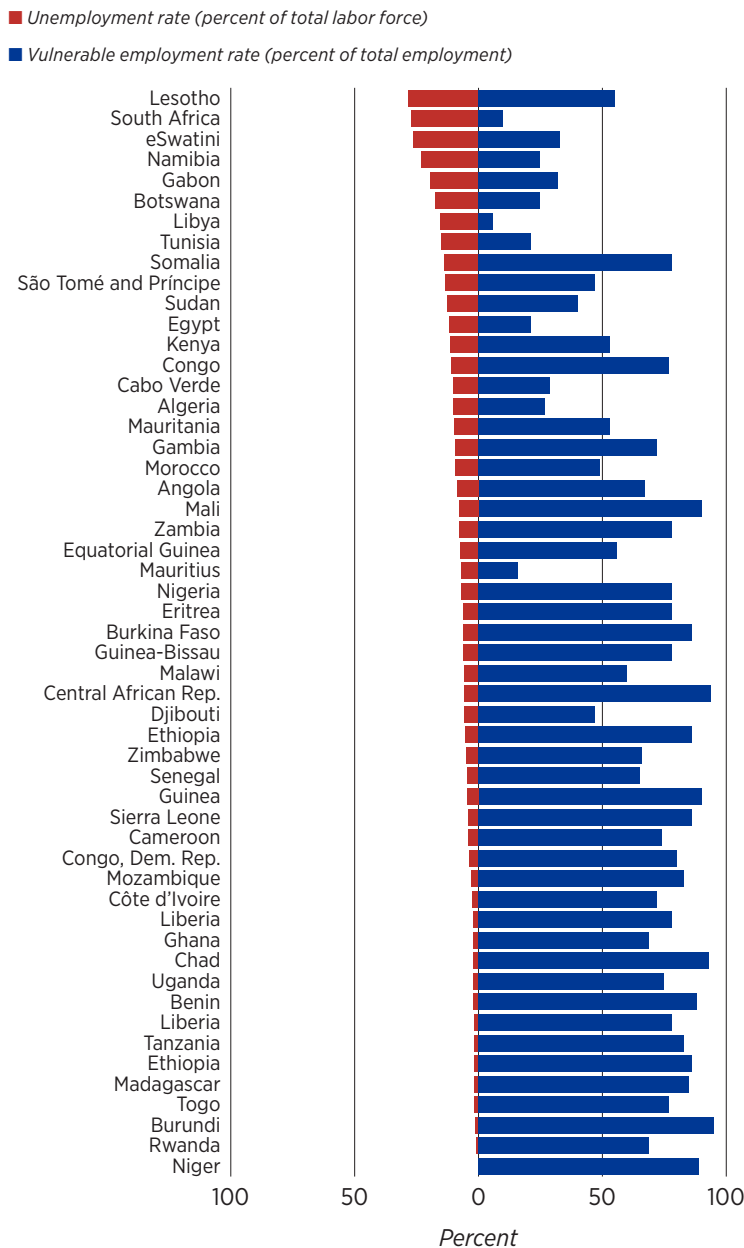
Contributing family workers

Contributing family workers are workers who hold “self-employment jobs” as own-account workers in a market-oriented establishment operated by a related person living in the same household. The rate of contributing family workers is the share of contributing family workers in total employment.

Vulnerable employment

It is the sum of own-account workers and contributing family workers. They are less likely to have formal work arrangements and are therefore more likely to lack decent working conditions, adequate social security and voice through effective representation by trade unions and similar organizations. Vulnerable employment is often characterized by inadequate earnings, low productivity, and difficult conditions of work.

FIGURE 1
Rates of unemployment and vulnerable employment, 2018



Source: Author, using data from International Labour Organization.

The most obvious reasons are the conceptual challenges of tackling unemployment and underemployment at the global level, and accounting for the unique features of Africa's labor markets.

The ambiguities of defining unemployment and comparing it across countries is the first source

of difficulty. Official definitions of unemployment and underemployment are widely accepted among economists and statisticians, but their operational significance and true meaning are still the subject of debate among policymakers. An *unemployed* person is defined by the ILO as a member of the labor force who meets the following criteria: not employed during the past seven days, even for one hour; looking for work; and available for work (box 1). The *underemployed* are the unemployed plus those who are employed part time (less than 30 hours per week) and want to work full time.

What makes the official numbers of unemployment in African countries puzzling is the fact that they present a much better picture than that of the most advanced economies. In 2018, official unemployment rates from the ILO in the following countries were the lowest in the world: Niger, 0.3 percent; Rwanda, 1.0 percent; Togo, 1.7 percent; Tanzania, 1.9 percent; Benin, 2.1 percent; Burundi, 1.5 percent; Chad, 2.2 percent; Ethiopia, 1.8 percent; Madagascar, 1.7 percent; Liberia, 2.0 percent.⁵ Not surprisingly, policymakers have had difficulties convincing their national constituencies that the demand for labor in markets is so buoyant.

Africa is also the world region with the highest proportion of the workforce in vulnerable employment, defined by the ILO as the sum of own-account workers and contributing family workers. Comparing the often very low unemployment rates with the very high rate of vulnerable employment sheds light on the conceptual and policy challenges facing economic policymakers across the continent (figure 1).

Despite growing skepticism about the significance of unemployment numbers, some still find it an initial useful metric to look at the performance of labor markets. After rising steadily from 4.4 percent in 1994 to a peak of 5.9 percent in 2003, the global unemployment rate (as percentage of the global labor force) has since been declining and stood to 4.9 percent in 2018.⁶ However, progress in reducing vulnerable forms of employment has stalled worldwide since 2012, with the rate remaining well above 42 percent.

Underlying these aggregate trends are profound disparities across regions, countries, and social groups: in high-income countries, the average unemployment rate declined from 6.7 percent in 1991 to 5.3 percent in 2018. It remained broadly stable in low-income countries during the same period (from 3.6 to 3.7 percent) while improving slightly in Sub-Saharan Africa (from 7.0 to 6.1 percent).⁷

Official definitions of unemployment and employment allow for comparative analysis but do not reflect the labor market realities of low-income countries that often exhibit dual economies, and are not operationally useful to policymakers there.⁸ In Sub-Saharan Africa, 70–90 percent of the labor force is engaged in nonwage employment. About 80 percent of these nonwage jobs are in agriculture, 10–30 percent are in household or microenterprises (this primary employment only). About one-third of those outside the wage and salary sector typically report multiple economic activities over the year—combining agriculture and nonagricultural enterprises. Almost all labor force participants in low-income households are in household-based activities—family farming and very small nonfarm enterprises, commonly called “informal enterprises.”

A more revealing story is provided by measures of the portion of the labor force employed full time for an employer (those working for an employer at least 30 hours per week). Africa’s general performance clearly appears to be suboptimal. Despite some episodes of growth acceleration and progress on educational enrolment and health indicators, the pace of employment generation has been disappointing.

Relative to other parts of the developing world and in absolute terms, African growth in per capita GDP has been insufficient and African employment has remained overwhelmingly informal in recent decades.⁹ The number of people underemployed—those who can’t find full-time work at a decent wage or the skilled workers forced to take low-skilled and low-productivity jobs—is the highest in the world at about 66 percent.¹⁰ This

is reflected in the fact that the continent (especially Sub-Saharan Africa) is the world region with the fewest wage earners in the labor force.

The still understudied household enterprise sector generates the majority of new nonfarm jobs in most African countries, even during times of high economic growth.¹¹ Household survey data show that, for the past decades, the informal sector (nonfarm) has been a growing source of employment for a large fraction of the African youth, but also for older workers trying to seize entrepreneurial opportunities. Its contribution to GDP and poverty reduction has been substantial, and it has become a major point of entry into the labor market for many. For youth in large cities such as Abidjan, Addis-Ababa, Dar-es-Salaam, Douala, Kinshasa, Lagos, or Nairobi, the informal sector is indeed the only viable option for making a modest living, even for those with secondary, vocational, and tertiary education. Why? Because the number of employers in the formal sector is limited, and there are skills mismatches in the labor market.

The northern part of Africa typically features some of the highest unemployment and underemployment rates in the world, driven by very high rates among youth and women. These two social groups face serious structural barriers reflected in the large gaps in education and inequality of opportunities. The NEET rate for youth in North Africa (“not in education, employment, or training”) is the second highest in the world.¹² Participation rates are very low (table 1), with rates for women the lowest in the world, reflecting early engagement in unpaid household work and institutional and cultural constraints.¹³

Sustained growth should create jobs, which drive poverty reduction and make growth more inclusive. But Africa’s recent high growth rates have not been accompanied by high job growth rates. Between 2000 and 2008, employment grew at an annual average of 2.8 percent, roughly half the rate of economic growth. Only five countries—Algeria, Burundi, Botswana, Cameroon, and Morocco—experienced employment growth of more than

TABLE 1
Participation rates in North Africa in 2018

Country	Employment to population ratio, ages 15 and older	Labor force participation rate, ages 15 and older
Algeria	37.2	43.9
Egypt	42.4	49.8
Libya	44.2	53.5
Mauritania	44.5	47.7
Morocco	44.3	49.2
Tunisia	39.6	47.6
North Africa	41.6	48.4
Africa	59.6	65.9

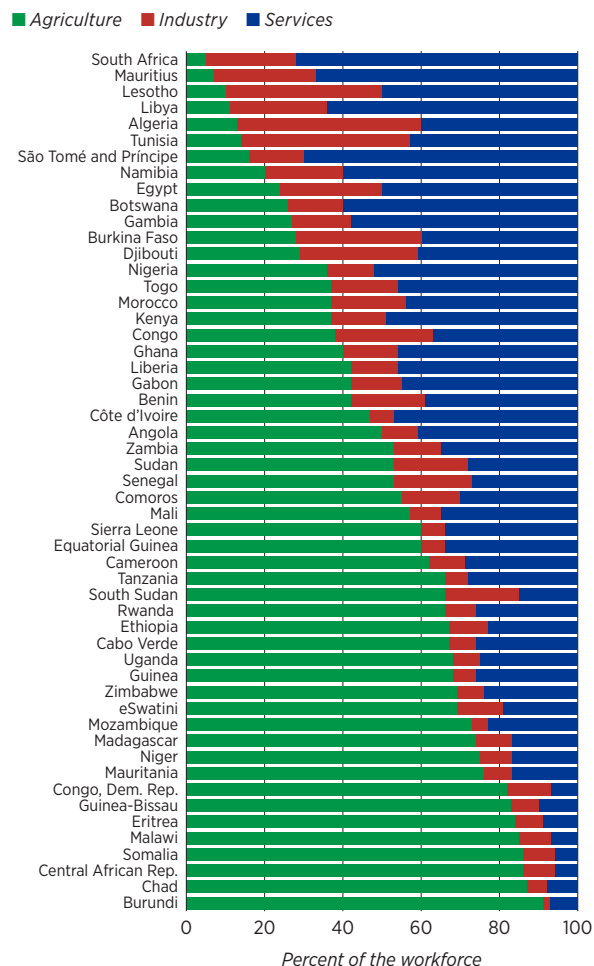
Source: International Labour Organization, ILOSTAT Database.

4 percent.¹⁴ Between 2009 and 2014, annual employment growth increased to an average of 3.1 percent despite slower economic growth. But this figure was still 1.4 percentage points below average economic growth. Slow job growth has primarily affected women and youth (ages 15–24). Africa’s youth was 226 million people in 2015, a figure projected to increase 42 percent, to 321 million by 2030. The lack of job growth has retarded poverty reduction. Although the proportion of poor people in Africa declined from 56 percent in 1990 to 43 percent in 2012, the number of poor people increased. Inequality also increased, with the Gini coefficient rising from 0.52 in 1993 to 0.56 in 2008 (the latest figure available).

Structural transformation—that is, the reallocation of economic activity and labor away from the least productive sectors of the economy to more productive ones—has been slow in Africa. Except for a few oil-exporting economies, no country has ever become rich and created enough jobs for its labor force without industrializing, despite its being a major driver of economic development.¹⁵ Agriculture, which employs most of the workforce (figure 2), is by far the least productive sector in Africa,¹⁶ and income and consumption are lower in agriculture than in any other sector.¹⁷

Since 2000, there have been substantial shifts in the occupational structure of most African economies, a good reason for cautious optimism about


FIGURE 2
Sectoral distribution of employment in Africa, 2018



Source: Author, using data from International Labour Organization.

the continent’s economic progress.¹⁸ There was structural transformation in some Sub-Saharan countries during 2000–10 as well as convergence in sector productivities within countries, but this change took place through strong movement in the shares of labor and output out of agriculture and into services rather than into industry. This shift lowered the relative productivity in services, in part because much of the movement was into lower-productivity nonwage employment.¹⁹

Various explanations have been provided for this shift of the labor force from agriculture into low-productivity services, including lower wage costs, lower energy costs, and lower logistical



costs,²⁰ and demographic growth, which swelled the labor force.²¹ Another explanation is that most African countries and much of the developing world neglected the key principle of successful economic development strategies, which is to ensure that the economy develops in a manner consistent with its comparative advantage and is competitive internationally.²² Unfortunately, the conventional policy frameworks implemented across Africa since independence tried to replicate the industries and institutions in high-income countries, set as the targets for their development policies. Instead of focusing on labor-intensive industries, which are the comparative advantages of African countries, governments often targeted capital- and technology-intensive industries, which prevailed in high-income countries. Such a misguided drive for “modernization” explains the persistence of commodity-dependent, job-scarce economies six decades after independence.²³

The import-substitution catch-up strategy without proper targeting of potentially viable industries, which most African governments promoted in the wake of independence, required governments to give priority to capital- and technology-intensive industries, which prevailed in high-income countries but defied African countries’ comparative advantages in labor-intensive industries. Firms in those industries were not viable in open and competitive markets. Entrepreneurs would not voluntarily invest in those industries, which were doomed to fail in competitive markets, without government protection and subsidies. Structuralism (as it was known) rightly identified market failures as the cause of developing countries’ inability to develop advanced, capital-intensive industries, but mistakenly called on the government to protect and subsidize nonviable firms in comparative-advantage-defying industries.

Likewise, the shift of the pendulum from “blind” import substitution toward “blind” liberalization and deregulation did not foster the emergence of labor-intensive industries. Eventually, the extraverted development strategies led to unsustainable investment into economic activities that were not

viable, to failed “white elephant” projects, to state capture and rent-seeking—and to disappointing results.

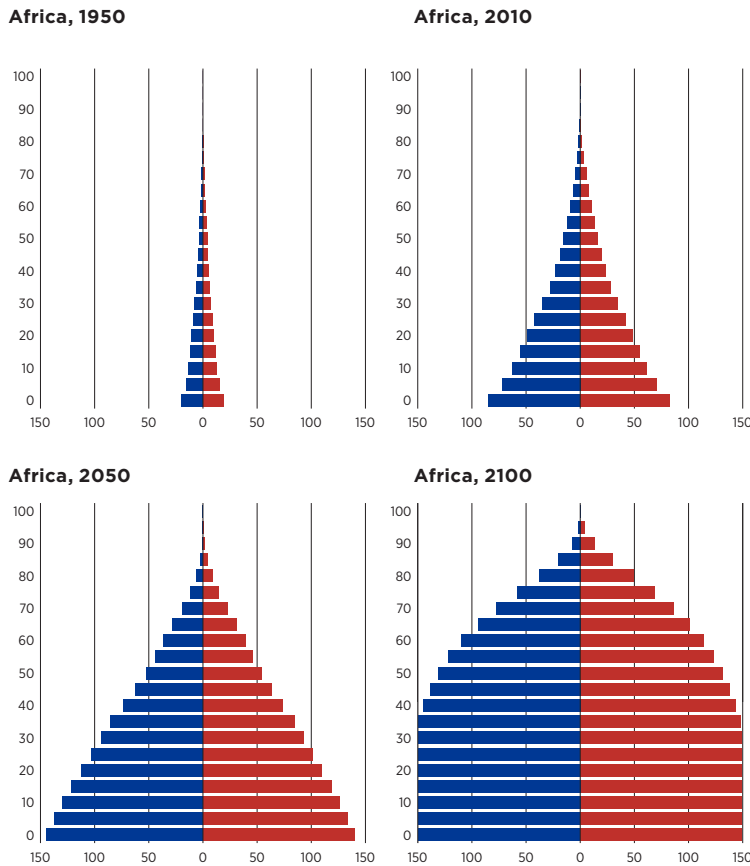
Valuable lessons have been learned. A number of African countries have been making substantial changes to their economic strategies to refocus them on the development of labor-intensive industries. Ethiopia, Kenya, Morocco, Rwanda, Senegal, and Tanzania are among those moving in that direction. All these countries have been improving policy to foster job creation. But the growth of formal sector employment remains insufficient to absorb the continent’s supply of new entrants in the labor force and absorb the youth bulge. About two-thirds of the continent’s population is under the age of 24 and is underemployed—including those with college and university degrees. Most workers are still trapped in very low-productivity activities in subsistence agriculture and the informal sector. To accommodate its high rate of population growth, Africa will have to generate between 12 million and 15 million jobs annually.

The dynamics of population growth makes things even more challenging: Africa will become the youngest and most populous continent in the next few decades. Its labor force will rise from 620 million in 2013 to nearly 2 billion in 2063. With population growth projected to be 2.2 percent in the next 25 years (figure 3), Africa’s “youth bulge” represents an unprecedented opportunity to generate inclusive growth and reduce poverty. With the rest of the world aging, especially the developed world, Africa can be the main supplier of the world’s workforce. At the macroeconomic level, all these unemployed and underemployed young people not only need jobs, but they can potentially create jobs and foster economic growth. Moreover, “if fertility continues to decline, rapid growth in Africa’s workforce will mean that the number of working-age adults relative to “dependents” will rise from just around 1 in 1985 to close to 1.7 in 2050, providing the space for savings, investment, and sustained economic growth. Yet the demographic transition is not automatic.”²⁴

FIGURE 3**Population by age groups and sex**

Absolute numbers

■ Male ■ Female



Source: Author, using data from United Nations—World Population Prospects.

A big concern is that the decline in fertility rates has been slow in many African countries. A delayed demographic transition to low mortality and low fertility poses a serious risk employment creation. Without a faster demographic transition, Africa is likely to experience a major surge in population. The demographic transition would combine greatly improved health outcomes with a large, rapid, and voluntary reduction of fertility rates. A low-fertility trajectory has a lower population growth rate and youth dependency ratio—and a higher ratio of arable land to population, rate of urbanization, level of schooling, level of human capital, total factor productivity, and GDP per capita.²⁵

There are reasons for cautious optimism. Many underlying features of Africa today might hasten the demographic transition and produce a demographic dividend. These features include some of the preconditions for fertility to fall in other parts of the world—such as economic development, social modernization, mortality decline, and a rise in natural fertility—but also the fact that the global community today is again, after a hiatus, interested in and proactively working to invest in voluntary family planning. All these conditions are conducive to faster fertility decline than in the past. And with the reforms attracting foreign direct investment in industries with strong competitive potential and thus allowing the private sector to create enough “good jobs,” the continent could exploit this demographic window of opportunity.²⁶

TRADITIONAL AND (MOSTLY) INEFFECTIVE REMEDIES TO UNEMPLOYMENT

Confronted with these daunting challenges, African policymakers have been trying to find solutions to unemployment and underemployment. The traditional remedies that experts offered to them for several decades are generally based on conventional economic analysis, and focus on the removal of distortions in the business environment. They typically include a list of reforms to make African labor markets more flexible and are politically difficult to implement:

- Changes in hiring and firing practices to reduce transaction costs for firms and give them more leeway—it is assumed that strong employment protection tends to make employers more reluctant to hire workers because it is then more difficult to let them go when business conditions worsen.
- Changes in the benefit system (level of benefits, duration, coverage, and tightness of the implementation criteria), which are viewed as an important factor affecting the reservation wage.
- Reductions in the tax wedge (tax-related difference between the cost to employ a worker

and the worker's take-home pay) to improve the supply and demand for labor.

- Changes in the wage-bargaining institutions—the coverage and strength of trade unions and their ability to bargain for higher wages or to organize strikes are seen as determinants of unemployment.
- Active labor market policies (training, employment subsidies, support with job matching and job applications, and the like) are intended to increase the chances of the unemployed finding employment.

There is obviously nothing wrong with such a policy agenda. But it is generally more appropriate for advanced economies where the level of full-time employment is high and where labor has become an expensive factor of production. In developing countries where full-time employment is low and where there are still labor surpluses, those policy measures rarely deliver the expected results. And because the traditional policy framework neglects the most glaring feature of low-income countries—the acute shortage of good jobs and their pervasive and high levels of informality—the empirical evidence on their effectiveness is ambiguous at best.

In Africa, limited financial resources make various active labor market policies—especially their sectoral and geographical targeting—either random or politically motivated. Because of vested interests, some binding constraints to growth and job creation (such as rigid labor laws) are politically too costly to remove all at once, or require large amounts of funding when envisaged for the whole country (infrastructure). Most Saharan countries started liberalizing their economies in the 1970s and 1980s and have implemented serious market reforms for several decades. Labor market regulations were substantially relaxed to make firing decisions by firms easier. While labor productivity (measured as percentage growth of GDP per person employed) is reported to have increased from -5.3 in 1990-92 to 4.4 in 2005-08 (before the global financial crisis), the employment to population ratios did not show much change: in 2008, it

was still averaging 64 percent for the entire population (15 years and older), the same level observed in 1991. For the youth (ages 15-24), it declined slightly in that 20-year period, from 50 percent to 49 percent.²⁷ These numbers have barely evolved in the past decade. Clearly, the labor market reforms have not created new formal sector employment opportunities.

Successful economic take-offs and substantial increases in labor demand require productivity growth. Labor force reallocations from the traditional, subsistence, low-productivity sectors to the modern high-productivity sectors must be a key part of African growth accelerations. They require not only the creation of jobs in modern agriculture, industry, and services, but also policies that empower the poor and the low-skilled workers to take advantage of the new opportunities that arise with structural transformation.

- A first priority for African governments is thus to encourage a shift toward labor-absorbing growth paths. They should put in place programs and policies aimed at modernizing the agricultural sector, which employs most of the population and is typically the main step toward industrialization.
- A second priority is to invest in human capital, particularly in the entrepreneurial skills of youth, to facilitate the transition to higher-productivity modern sectors in which each country has comparative advantage.
- A third priority is to improve economic governance and to build credible institutions for effective policymaking.

The remainder of this study outlines a strategic framework and specific policy instruments to achieve some quick wins and reach these goals.

JOB CREATION THROUGH NEW FORMS OF INDUSTRIALIZATION

Economic prosperity is achieved through structural transformation, whereby a society's resources (labor, capital, and technology) are moved from

BOX 2

Greening African industrialization

Economic growth can be achieved through a range of economic activities. By choosing certain activities, economic growth can be decoupled from environmental harm. In some cases, environmentally superior choices may also enhance economic productivity (as through efficiency gains) or human welfare (for example, through goods and services provided by natural environments). Green growth is the selection of economic activities that, at best, promote environmental and social development and, at a minimum, do not harm the environment or human welfare. It is achieved through rigorous analysis of economic alternatives and their related environmental and social impacts. In Africa, it means pursuing inclusive economic growth through policies, programs, and projects that invest in sustainable infrastructure, better manage natural resources, build resilience to natural disasters, and enhance food security.

Many of Africa's economies depend heavily on natural resource exploitation. Much of Africa's population also relies directly on natural systems for its immediate health and livelihoods. This reliance makes African populations particularly vulnerable to overexploitation of the continent's natural assets and destruction of its natural systems. Improved natural asset management will mitigate these acute threats to the environment and economic growth, while reaping the benefits of Africa's abundance. Climate change is a major motivation for green growth, for Africa, as with other regions, but the role of climate change in Africa differs. Africa has contributed less than other regions to climate change and other global environmental changes, but the region's economies and populations are expected to suffer disproportionately from the negative effects.

Green growth is compatible with Africa's priorities. Africa can use its infrastructure deficit to leapfrog to greener investments by using environmentally sound technologies and innovations now available. Greener infrastructure can also address food insecurity through enhanced climate resilience and wiser land and water management. A green economy cannot be created overnight, nor is there a one-size-fits-all approach.


Source: African Development Bank 2012. <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Facilitating%20Green%20Growth%20in%20Africa.pdf>.

the sectors where they yield few economic benefits to those where the payoffs are the highest—and this occurs through industrialization. Few countries have been economically successful without industrializing. Only in circumstances such as extraordinary abundance of natural resources or land could countries do so.

Industrialization is an ever more powerful engine for economic and social change in the context of globalization, as it provides an almost infinite potential for growth—especially for many low-income countries. Besides the generally much higher productivity in industry (especially manufacturing) than in traditional agriculture, the main reason for the growth in industrialization is that its potential is virtually unlimited, especially in an increasingly globalized world. As agricultural or purely extractive activities expand, they usually face shortages of land, water, or other resources. In contrast, manufacturing easily benefits from economies of scale. Thanks to new inventions and technological development, and to changes in global trade rules, transport and unit costs of production have declined in the past decades, facilitating industrial development.

Several decades ago, low-income countries faced the constraints of their limited market size, high transportation costs, and trade barriers, and could not take advantage of the opportunities offered by manufacturing. With globalization, virtually any country can identify products for which it has overt or latent comparative advantage, facilitate the entry of its firms into global value chains, and scale up production almost without limit, thus creating its own niche in world markets. Today, almost any small country can access the world market, find a niche, and establish itself as a global manufacturing place. For example, Qiaotou and Yiwu, two once small Chinese villages, have become powerhouses, respectively producing more than two-thirds of the world's buttons and zippers!

Industrialization also promotes inclusive development by expanding the fiscal space for social investments. In such a context, fiscal revenues are



likely to increase due to exports of higher value added, rising profits of companies, and better incomes earned by a more productive and innovative labor force.

Within the industrial sector, manufacturing has evolved and changed the dynamics of the world economy. Profound changes in geopolitical relations among world nations, the widespread growth of digital information, the decline of transportation costs, and the development of physical and financial infrastructure, computerized manufacturing technologies, and the proliferation of bilateral and multilateral trade agreements—all have contributed to the globalization of manufacturing. These developments permitted the decentralization of supply chains into independent but coherent global networks that allow transnational firms to locate various parts of their businesses in various places around the world. The creative design of products, the sourcing of materials and components, and the manufacturing of products can now be done more cheaply and more efficiently from virtually any region of the planet—while final goods and services are customized and packaged to satisfy the needs of customers in faraway markets.

The globalization of manufacturing has thus allowed developed economies to benefit from lower-cost products driven by the lower wages used for production in developing countries such as China, India, Bangladesh, Costa Rica, Mexico, or Brazil while creating job and learning opportunities in these formerly poor nations. The intensity of these exchanges has led to new forms of competition and co-dependency. While Africa has entered global value chains, it still does it with unprocessed, low-end products, with little value addition.


Africa has enjoyed strong economic growth for almost two decades, but the continent has not seen a commensurate rise in industrialization. On average, African industry generates merely (\$700 of GDP per capita, which is less than a third of the same measure in Latin America (\$2,500) and

barely a fifth of that in East Asia (\$3,400). In addition, African exports consist of low technology manufactures and unprocessed natural resources, which represent more than 80 percent of exports from Algeria, Angola, or Nigeria, for example.

Structural transformation has been taking place across much of Africa since the early 2000s, thanks to economic growth, demographics, urbanization, and technological developments. But the process is very slow. The continent still accounts for just 1.9 percent of global value added in manufacturing—a share that hasn't risen in decades. Moreover, Africa's population of 1.2 billion is growing fast, at 2.6 percent a year, with the youth bulge—70 percent of Africa's population is under the age of 30—putting pressure on governments suffering from weak planning and managerial capacity.

Africa's industrialization would be a win-win for the world. With appropriate policies, it would help to raise productivity in the continent, including by spurring technological progress and innovation, while creating higher-skill jobs in the formal sector, thereby boosting average incomes and domestic consumption. It would also promote linkages between the services and agricultural sectors, between rural and urban economies, and among consumers, intermediates, and capital goods industries. And by making the prices of manufactured exports less volatile and susceptible to long-term deterioration than those of primary goods, it would help countries escape dependence on commodity exports.

On one estimate, increasing manufacturing's share of GDP in Africa and least-developed countries could lead to an aggregate positive investment shock of about \$485 billion, and to an increase in household consumption of about \$1.4 trillion.²⁸ Indeed, per capita investment would rise by \$66 for each additional percentage point in manufacturing's share of GDP in Africa, while per capita consumption would increase by \$190. This rise in investment and consumption would boost demand for imported capital and consumer goods from other world regions. Increased



production of capital and consumer goods would activate several multiplier effects, generating further demand for intermediate inputs, higher employment, and faster income growth in advanced and least developed countries. African industrialization would also help achieve global stability and peace, as there would be fewer incentives for the young, unemployed, and often low-skilled people across the continent to engage in illegal migration to Europe.

Empirical research examining developing countries as whole has shed light on the mystery of deindustrialization. Haraguchi et al. (2017) have analyzed several decades of employment data on over 100 developing countries, going back to 1970. They explore whether the low industrialization in developing countries is attributable to long-term changes in opportunities available to the sector around the globe. They find that manufacturing employment became geographically more concentrated after 1990, but no less important. Their study's findings show that the manufacturing sector's respective value added and employment contributions to world GDP and employment have not changed much since 1970.

The declining manufacturing value added and manufacturing employment shares in many developing countries have not been caused by changes in the sector's development potential. Instead, they resulted from a shift of manufacturing activities to a relatively small number of populous countries, thus concentrating manufacturing activities in specific developing countries. While the average of each country's manufacturing–employment ratio has indeed declined since the early 1990s, the aggregate of manufacturing employment in developing countries is actually higher than in earlier decades.²⁹ This counter-intuitive finding can be explained by the fact that the workforce in some developing countries—such as China—is so large that a stagnation or even a decline in the percentage of manufacturing in the labor force does not translate into a decline in the absolute aggregate number of workers in that sector.

Still, worries about deindustrialization and about the importance of industrialization in modern growth and structural transformation processes have been compounded by the lackluster global trade climate in the wake of the 2008 financial crisis.³⁰ This new trade skepticism has led many researchers and policymakers to wonder whether today's low-income countries could benefit from the same export opportunities that allowed rapid industrialization in Asia in the 1970s–90s—even if they could adopt the right policy frameworks and develop their manufacturing production bases. While it is indeed true that global trade grew at a lower rate than global GDP in the decade following the 2008 financial crisis, over the long term, the trade–GDP relationship is usually not static.

Despite the resurgence of the protectionist discourse in some advanced economies, and the persistence of nontrade measures, the general, long-term trend of global trade is still very positive for developing countries. Moreover, the declining general trend in average tariffs around the world since World War II is unlikely to be rolled back given the structural changes they have induced in the global production system and the enormous win–win opportunities they have created for advanced and developing economies. The best indicator of that evolution is that many goods are now manufactured in several countries at the same time. Global trade is therefore no longer a series of transactions between countries producing individual goods and services within their national boundaries and exchanging them in international markets. It is often about collaboration and partnerships, even in an intensively more competitive world. Manufacturing is increasingly a network of global supply chains in which the various production stages take place in the most cost-efficient locations—regardless of where they are in the world.³¹

The world economy has changed dramatically since the 1980s, and new opportunities for growth and job creation are now available to Africa. Emerging and developing economies now represent more than half of global GDP (measured

BOX 3

Can services create enough decent jobs in Africa?

Some researchers have observed that manufacturing is not the only driver of growth. An ongoing Third Industrial Revolution led by services may now contribute substantially to output growth, productivity growth, and job growth in low-income countries.¹ Indeed, services are invalidating some long-held tenets of economic development: for centuries, the service trade was limited because it required proximity and face-to-face interaction between the buyer and the seller. But this is no longer the case, as technology and innovation allow services to be produced and traded just like manufactured goods. Moreover, the cost of trading services that can be digitized has fallen dramatically, since they do not have to confront customs and other logistical barriers. And service-led growth is greener and more gender-friendly.

These observations have led Ghani and O'Connell to suggest that the services sector, branded as a growth escalator for low-income countries, should be given priority in the design of structural transformation strategies. They conclude: "Unlike the goods sector, where developing countries already have a large market share, making it difficult for new entrants to become large-scale exporters, services appear to be steadily expanding, with catch-up opportunities continuing to rise and entry for all... A service-led growth can be sustained because the current globalization of services is only the tip of the iceberg, and service is the largest sector in the world, accounting for more than 70 percent of global output" (2014: 20 and 21).

Today's global economy certainly offers infinite opportunities for growth and transformation in the service sector, but not to countries at all levels of development. So, one should be careful not to draw swiping policy recommendations from the fact that an increasingly large service sector is driving global growth. First, there is a semantic issue to be addressed: manufacturing no longer means the type of old, capital-intensive industries that spurred the First Industrial Revolution in the eighteenth and nineteenth centuries. With the advent of the Second Industrial Revolution, manufacturing has become a continuum of activities that are interlinked.

As noted by Schwieters and Moritz, "One key indicator is that conventional boundaries between industries are eroding. It's getting harder to tell the difference between, say, a telecommunications company and an entertainment producer, or between a retail bank and a retail store. The relationships among suppliers, producers, and consumers are also blurring, more rapidly than many business decisionmakers are prepared for" (2017; <https://www.strategy-business.com/article/10-Principles-for-Leading-the-Next-Industrial-Revolution>). The definitions of agriculture, manufacturing, and services should therefore evolve to reflect the constantly changing boundaries of these sectors. In its current meaning, manufacturing should be understood in its broadest sense as all trade based on the fabrication, processing, or preparation of all kinds of products from raw materials and commodities to chemicals, textiles, machines, equipment, and even modern services and virtual goods.

The second reason why policy recommendations cannot necessarily follow from the increasing service sector growth is that even in developing countries, where there has been a boom in the service sector without industrialization, a lot of these services are low-productivity, subsistence level, and sometimes even informal activities that may help households escape poverty but are not sustainable sources of growth. The type of high-productivity services that offer long-term growth prospects to nations (in sectors such as informational technology or banking and finance) are skill-intensive. Yet by definition, low-income countries have a weak skills base. That is certainly

(continued)

the case in most African and South Asian countries where the demographic structure and limited fiscal base do not allow for the rapid build-up of the kind of human capital necessary to sustain economic transformations driven by high-productivity modern services. Even developing countries such as India, Sri Lanka, Kenya, Cameroon, or Egypt, where substantial amounts of public funding have been devoted to the creation of strong education systems, too often end up exporting much of their skilled labor.

Consistent with the basic rationale for structural transformation, which is to constantly move labor and capital into higher-productivity sectors, it is logical that advances in the modern service sector, rather than in traditional manufacturing, will drive the growth of living standards in the advanced economies in the future and in the middle-income countries that successfully manage their industrial upgrading process. However, for low-income countries, low-skilled labor-intensive employment will still offer sizable growth opportunities—especially with the upcoming graduation of large middle-income countries like China or Indonesia, which is freeing up substantial quantities of industrial employment.²

Notes

1. Ghani and O’Connell 2014; Enache et al. 2016.
2. Lin 2011.

Source: Monga and Lin 2019.

in PPP terms). Many African countries can take advantage of rising manufacturing wages in large and good-performing middle-income countries such as China by attracting a large share of the estimated 100 million jobs that will have to be relocated—if they can out-compete other low-income economies of the world by quickly and effectively implementing key strategic reforms to accommodate domestic and foreign investors.³² Employment in Africa’s manufacturing sector is still very low. While automation may absorb some of these jobs, “labor arbitrage” still provides substantial opportunities for African economies in labor-intensive industries losing competitiveness in China because of rising wage and productivity levels (see annex). Despite the threat of automation of routine tasks in labor-intensive industries, Ethiopia has already shown that smart industrial policy can help attract a large number of jobs from China.³³

There are also many signs of outsourcing services, as call centers and financial services emerge in countries such as Kenya and Nigeria. In agriculture, too, changes in global food markets—most

notably increased demand and prices—are also likely to open new avenues for job creation to Africa. In addition to light manufacturing potential, many African countries are endowed with vast amount of arable land (often with a cultivation rate of less than 10 percent) and rich minerals (including oil, copper, gold, diamonds, coal, iron, uranium, nickel, chrome, tin, and platinum). The challenge is how best to turn the untapped natural resources into productive assets in diversified economies that generate jobs and income.³⁴ Lessons from other countries that have successfully exploited similar opportunities to diversify and industrialize their economies can inform policy design and implementation.

Voodoo predictions about the future of work

Recent developments in digitization, artificial intelligence and robotics have renewed the debate over the implications of these technological advances for employment creation, especially in low-skilled industries that still offer substantial growth opportunities to low-income African countries.

Among mainstream economists, the current conventional wisdom is rather bleak. A few years ago, the World Bank President boldly declared: “We estimate that two-thirds of all jobs that currently exist in developing countries will be wiped out by automation.”³⁵ This rather pessimistic view was consistent with the main conclusions of other studies estimating that automation could destroy 57 percent of jobs in OECD countries³⁶ and that up to half the world’s jobs—around 2 billion—are at high risk of disappearing due to automation in the coming decades,³⁷ including 47 percent of jobs in the United States.³⁸

“The only thing we have to fear is fear itself—nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance,” said Roosevelt (1933). If history is indeed used as a guide, none of these bleak predictions about the future of work will materialize. Bleak conjectures of large-scale job destruction and high technology-driven structural unemployment were also made in each of the previous major episodes of automation, and yet they never occurred. Even the best economists such as John Maynard Keynes and Wassili Leontieff made pessimistic predictions about automation and were later proven wrong. Since the Industrial Revolution, each major wave of technological change has acted as a powerful driver of productivity and employment growth.

From the first three industrial revolutions (see box 5 below), we have learned that while technological innovations destroy some existing jobs but at the same time, they also create new ones. In other words, modern technologies reduce demand for low- to middle-skill workers in routine jobs, such as clerical work and repetitive production, but they also positively impact the demand for higher-skill workers in technical, creative, and managerial fields. It follows that policymakers should adopt strategies to equip their workers with the higher skills that a changing labor market demands, and supporting workers during the adjustment. They should also reform, strengthen, and enrich the education systems to facilitate constant learning

(some of the specific policies to achieve these objectives are discussed below).

Optimism is generally justified on the reasoning that innovation and new technologies have indeed improved productivity, which eventually, could make everyone better off. Digitization, artificial intelligence, and robotics can not only replace workers but also to make human labor more productive, thereby increasing labor demand. In some industries and sectors, this process would make humans the central characters in the production process. In others, it would create new tasks in which humans have a comparative advantage. The net effect could be increases employment and wages, and a more equitable distribution of resources.

Acemoglu and Restrepo explain the dynamics well: “Consider agricultural mechanization, which started in the nineteenth century. At first, the substitution of machines for raw labor did reduce the share of labor in value added, displacing a huge share of the U.S. workforce that had previously been employed in farming. But, at the same time, burgeoning new industries needed workers to perform novel tasks and pursue emerging occupations. Clerical positions expanded both in services and manufacturing, where a finer division of labor boosted productivity, employment, and wage growth.”³⁹

However, Acemoglu and Restrepo also note that while these positive trends of automation lifting productivity levels and eventually benefiting everyone were observed in the decades following World War II, things have changed in the past 30 years because the accompanying changes needed to offset the labor-displacement effects of innovation have been absent. Consequently, wage and employment growth has remained stagnant, and productivity growth anemic. They also suggest that artificial intelligence in particular may exacerbate this pattern, leading to inequality and long periods of slow wage growth and even declining labor market participation.

The theoretical foundations for assessing whether innovation eventually helps or hurts labor and

equity has been the subject of recent debates, with little consensus among economists.⁴⁰ The basic question often asked is whether increases in productivity actually always make everyone better off, with the production possibilities curve always moving out in economic models and therefore representing a societal Pareto improvement. In several advanced economies, it has been documented empirically that the story is not always a positive one.⁴¹ In real life, things are not so unidimensional: There are always winners of losers, as some innovation permanently reduce the demand for unskilled labor and decrease their wages, even if they increase the wages of skilled workers.

The expectation that such skill-biased innovations are eventually welfare-enhancing is taken too broadly to imply that the gains of the skilled workers compensate for and offset the losses of the unskilled workers. Yet, such compensations would

not occur automatically. As automation replaces workers with machines in an increasingly larger number of production tasks, it also reduces labor's share of value added and contribution to national income, which may depress employment and wages. With unskilled workers already at the bottom of the income distribution, innovation shocks may be positive in aggregate for the economy, but worsen inequality. "In this situation, whether societal welfare is increased depends on how one weighs the benefits to the relatively rich against the losses to the relatively poor."⁴² Moreover, with market imperfections and societal rigidities (for instance, not all low-skilled workers can be moved, trained, and converted into higher-skilled labor in the face of some innovation), most groups can find themselves worse off.

How should African policymakers worry about all this? Is innovation in the continent and globally

BOX 4

Employment opportunities in creative industries

A 2008 United Nations report on the global creative economy stressed that the rapid growth of creative and cultural industries (the creation, industrial reproduction, and mass distribution of cultural works) was not just a phenomenon of advanced countries but was also notable in developing nations. The report concluded that "The interface between creativity, culture, economics, and technology, as expressed in the ability to create and circulate intellectual capital, has the potential to generate income, jobs, and exports while at the same time promoting social inclusion, cultural diversity, and human development. This is what the emerging creative economy has begun to do."

The importance of creative industries is now widely recognized.¹ In some countries, the definitions revolve around the arts and culture. Other countries have broader definitions that include, for example, food and gastronomy, in that food and cuisine have both economic and cultural significance. Other countries have a definition that includes well-established business-to-business industries such as publishing, software, advertising, and design. The internet has stimulated the development of platforms for new creative expression. For example, in just 15 years after its birth, the videogames industry had surpassed the century-old film industry in value.

Within the creative industries, the movie business can be a powerful engine for economic development and job creation. It tends to favor women's participation, and contribute significantly to youth employment. African

(continued)

countries can benefit from the movie economy in a number of ways, if they have environments where it can grow. They can do so first as producers of films that are distributed and screened locally and internationally, with each step in the film process—from conception to exhibition—generating spending, jobs, taxes and export revenue both directly and in ways that lift the wider economy. Because the film sector depends on many other industries, its growth inevitably boosts the wider economy. A 2017 report by South Africa’s National Film and Video Foundation, for example, found that the country’s film economy raised overall production and had a sizeable spillover effect on other sectors.

Countries are also consumers of foreign film imports that are distributed and screened in local markets. While imported films may offer fewer economic benefits than domestic productions, they, too, can create direct jobs and income for local distributors and exhibitors (from traditional film halls to online streaming platforms). They can also make a wider impact, such as growing local commerce.

Foreign productions shot in-country provide yet another revenue stream. Foreign movie crews pay for hotels, catering, filming permits, transport, and local workers, among other expenditures. They can also build local capacity, by providing jobs and skill training. That said, competition is rife for foreign shootings, and successful countries are not only those with stunning scenery, but also those that provide a raft of incentives, including tax rebates and state-of-the-art production and post-production facilities.

In addition, the film business is a big driver of both domestic and foreign tourism. From China to the U.S. states of Louisiana and Georgia, popular movies can attract millions of fans to the locations where they were shot. The private sector is riding the tourist boom in myriad ways, from building theme parks to selling T-shirts of popular movies.


Film festivals are another big tourism generator. Tens of thousands of movie buffs flock to Tunisia’s Carthage Film Festival and Burkina Faso’s Pan-African Film and Television Festival of Ouagadougou, spending millions of dollars on hotels, restaurants, and transport during their stays—and both festivals have the potential to grow their revenues further.

Africa has some key assets when it comes to both attracting foreign business and expanding its own footprint. Among them: the continent’s wealth of stunning and diverse landscapes, inexpensive manpower, favorable foreign exchange rates—and a potentially big domestic market with a taste for local content that is fueled by an expanding middle class.

A number of countries are growing their local market share without the enormous Hollywood-style movie budgets. The contribution of Nigeria’s film industry (Nollywood) to GDP was estimated at \$7 billion in 2017 (1.4 percent of GDP), and the potential is even bigger.² It created about 1 million jobs, 300,000 directly. Other countries such as Egypt, Morocco, Tunisia, South Africa, and Ghana are also adopting policies to reap the economic benefits of a booming film industry.

Notes

1. Kabanda 2018.
2. African Development Bank forthcoming.



currently an impediment or a threat to job creation in Africa? The short answer is that digitization, robots, and artificial intelligence are currently not taking away manufacturing jobs which African workers do not even have yet!⁴³ To the contrary, Africa's economic status as a latecomer to industrialization, and its economic trajectory, actually gave her more options for job creation in the decades ahead than other regions in the world. Industrial upgrading in large emerging economies such as China, Vietnam, and Indonesia, and productivity gains brought to upper-middle income economies by the fourth industrial revolution and global trade are actually providing new opportunities for employment generation in many African countries.⁴⁴

How could this be?

Consider employment in agriculture. The general story everywhere else in the world, sustained by theoretical analyses⁴⁵ and confirmed by empirical studies,⁴⁶ is as follows. With automation, productivity increases are generally so large—especially given the inelasticity of demand for agricultural goods—that incomes in the sector always decline. In countries and regions where there is perfect mobility, the surplus agricultural workers would almost seamlessly move into the urban sector and other industries and services, and structural transformation would occur with minimum cost for the adjustment process.

In Africa, the evolution of employment in agriculture has not been so theoretical and so smooth. With few profitable economic opportunities in the traditional, low-productivity agricultural sector, no access to credit, low wages, and the declining value of agricultural land, labor in rural areas has often been forced to move into urban areas to work in the low-productivity informal sector. Mobility has indeed taken place but at enormous economic and social costs. Rural workers who find themselves in large cities do not obtain there the skills they would need to join the few industries in services offering sustainable, decent employment. With incomes collapsing in the rural areas and few young workers willing to remain there, the average age of

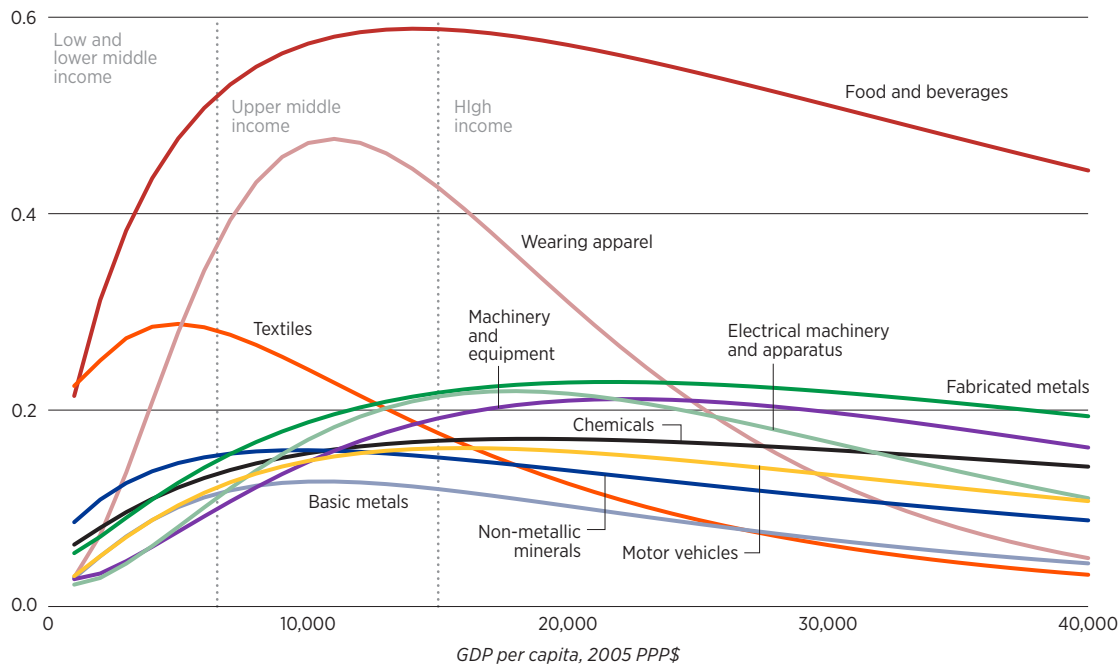
African farmers has been rising in recent decades (to more than 60 years in some countries), making productivity growth in traditional agriculture a challenge. Because of poor policies, many African countries have transitioned from being a self-sufficient country in food to being a net importer, spending billions of dollars annually on imports of rice, fish, sugar, and other basic crops.⁴⁷

Not surprisingly, African rural areas have remained disproportionately poor and jobless, while the continent has been wasting precious foreign exchange to import food (\$65 billion in 2017, according to UNCTAD). Yet Africa has 65 percent of the arable land left to feed the world. As Adesina notes, “The current situation where Africa spends [billions of dollars] annually on food imports is not acceptable. Ultimately, rising food imports hurt farmers in Africa. Cheap food imports decimate rural economies, displace farmer incomes, and divert scarce foreign exchange. Instead, they replace what Africa should be producing very well, and make it impossible to create millions of jobs for young people that agriculture indeed can provide.”⁴⁸ This is a clear case where mechanization, automation, and modernization could actually help transform agriculture, and create new jobs both directly and indirectly, unlike what may be happening in other regions in the world.

The change needed requires a shift in mindset and better economic policies. First, African policymakers and development stakeholders should stop approaching agriculture a developmental activity or a social sector for managing poor people in rural areas. Instead, agriculture should be viewed as a business with enormous possibilities for employment, profitability, and macroeconomic benefits. Second, careful thinking should be given to the value addition of individual crops with competitive potential (determined through joint work by the private sector, governments, farmers groups, and research institutions). Empirical analyses of industries and sectors with strong employment potential at various levels of development show that food and beverage industries offer the highest probability of jobs in all countries at all levels of income (figure 4)

FIGURE 4
Job opportunities in various industries

Employment/population (multiplied by 100)



Source: UNIDO 2013.

Third, innovative financing frameworks should be made available to agripreneurs and industrialists with viable agro-industrialization projects. Finance is indeed an indispensable catalyst to growth and job generation. Yet in much of Africa, less than 3 percent of all bank lending goes into agriculture—a sector that still represents 17.4 [40] percent of GDP and 51 percent of employment.⁴⁹ It is all the most surprising as banks in Africa have very high levels of liquidity, the highest profitability rates in the world, and the highest Z-scores, which captures the probability of default of a country's banking system.⁵⁰ The reasons banks are reluctant to finance farm activities vary from one country to the other. But in general, they just don't find enough profitable, credible, and relatively secure business opportunities offered by agriculture. The perceived risk of lending to African agriculture in its current dominant model of small farms with low-productivity levels are just too high.

Positive new developments in recent years could be scaled up to boost employment creation in

rural areas across the continent. In Nigeria, for instance, the government developed a facility with the Central Bank of Nigeria—helped by donor assistance from the United Kingdom, German, and U.S. development agencies—called Nirsal, an agribusiness initiative that provides risk management, financing, trading, and strategic solutions. Nirsal benefited from a relatively small initial endowment to leverage \$3.5 billion, reduce the risk of agricultural lending by providing credit risk guarantees and brokerage services to buyers and sellers of agricultural commodities, including structured buyer forums. It was also designed to selectively buy on its own account to bring stability to markets. In addition, Nirsal offers advice designed to connect suppliers with downstream buyers.⁵¹ African countries could draw lessons from other effective models of sustainable financing of agriculture from around the world.⁵²

Beyond agriculture, the risks that automation would destroy more jobs in Africa's already small formal sector than it would create can be

mitigated. Robotics and artificial intelligence could be configured to reorganize work processes in agro-processing, manufacturing, and modern services and create new labor-intensive activities. As Acemoglu and Restrepo note, “In education, for example, real-time data collection and processing by AI systems can empower teachers to offer individualized instruction calibrated to each student’s needs, which likely vary from subject to subject. The same applies to health care, where AI can empower technicians and skilled nurses to offer personalized treatments. Moreover, AI’s potential benefits for labor are not confined to services. Thanks to advances in augmented and virtual reality, it can also be used to create new tasks for humans in high-precision manufacturing, which is currently dominated by industrial robots.”⁵³

Some of the infinite possibilities that innovation actually provides for developing regions of the world is documented in a recent empirical study devoted to the impact of the Internet on employment, equity, and incomes in Africa. Hjort and Poulsen (2019) estimate how fast Internet affects employment in Africa. They use the gradual arrival of submarine Internet cables on the coast of the continent, and maps of the terrestrial cable network. Estimates from three datasets covering 12 countries show large positive effects on employment rates—also for less educated worker groups—with little or no job displacement across space. They reach three conclusions:

- First, the probability that an individual is employed increases by 6.9 percent to 13.2 percent in the groups of countries covered by household survey datasets, and by 3.1 percent in South Africa, when Internet becomes available. The increase in employment in connected areas is not due to displacement of jobs in unconnected areas.
- Second, the probability of being employed in a position belonging to a skilled occupation increases substantially, but the probability of holding an unskilled job is statistically unaffected, when fast internet becomes available. The internet thus appears to shift employment shares to higher-productivity occupations.

- Third, firm-level data available for some countries indicate that increased firm entry, productivity, and exporting contribute to higher net job-creation, and average incomes rise.

These findings corroborate theoretical analyses by Stiglitz (2018). While the Fourth Industrial Revolution brings new challenges for some categories of jobs, public policies, and incentives to support well-targeted productive infrastructure such as fast internet can help achieve socially desirable outcomes (box 5). The challenge of poor business environments and weak governance still needs to be addressed, especially in African countries where politically difficult reforms often take time. The most effective strategy to circumvent constraints to growth and boost productivity and job creation generally rests on three pillars:

- Prudent macroeconomic policies geared to ensuring external competitiveness.
- Carefully designed labor-intensive public works programs if the fiscal and debt situation make them possible.
- Well-targeted, well-located, and well-equipped special economic zones and industrial parks to facilitate the development of industries with strong competitive potential. When carefully designed and managed, such enclaves of excellence allow businesses to operate efficiently even in suboptimal business environment, connect small and large domestic and foreign firms, and provide platforms for capacity development and skills formation.

PRUDENT MACROECONOMIC POLICIES TO SUPPORT EMPLOYMENT

Macroeconomic stability is a precondition for sustained growth and the creation of decent jobs, especially for developing economies that are small and most vulnerable to shocks. In that framework, the role of demand policies in the fight against unemployment is important, especially

BOX 5

The Fourth Industrial Revolution: What it means, how to respond

“We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society.

The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies blurring the lines between the physical, digital, and biological spheres.

There are three reasons why today’s transformations represent not merely a prolongation of the Third Industrial Revolution but rather the arrival of a Fourth and distinct one: velocity, scope, and systems impact. The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.

The possibilities of billions of people connected by mobile devices—with unprecedented processing power, storage capacity, and access to knowledge—are unlimited. And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.

Already, artificial intelligence is all around us, from self-driving cars and drones to virtual assistants and software that translate or invest. Impressive progress has been made in AI in recent years, driven by exponential increases in computing power and by the availability of vast amounts of data—from software used to discover new drugs to algorithms used to predict our cultural interests. Digital fabrication technologies, meanwhile, are interacting with the biological world on a daily basis. Engineers, designers, and architects are combining computational design, additive manufacturing, materials engineering, and synthetic biology to pioneer a symbiosis between microorganisms, our bodies, the products we consume, and even the buildings we inhabit.

Like the revolutions that preceded it, the Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life around the world. To date, those who have gained the most from it have been consumers able to afford and access the digital world; technology has made possible new products and services that increase the efficiency and pleasure of our personal lives. Ordering a cab, booking a flight, buying a product, making a payment, listening to music, watching a film, or playing a game—any of these can now be done remotely.

In the future, technological innovation will also lead to a supply-side miracle, with long-term gains in efficiency and productivity. Transportation and communication costs will drop, logistics and global supply chains will

(continued)

become more effective, and the cost of trade will diminish, all of which will open new markets and drive economic growth.

At the same time, as the economists Erik Brynjolfsson and Andrew McAfee have pointed out, the revolution could yield greater inequality, particularly in its potential to disrupt labor markets. As automation substitutes for labor across the entire economy, the net displacement of workers by machines might exacerbate the gap between returns to capital and returns to labor. On the other hand, it is also possible that the displacement of workers by technology will, in aggregate, result in a net increase in safe and rewarding jobs.

We cannot foresee at this point which scenario is likely to emerge, and history suggests that the outcome is likely to be some combination of the two. However, I am convinced of one thing—that in the future, talent, more than capital, will represent the critical factor of production. This will give rise to a job market increasingly segregated into “low-skill/low-pay” and “high-skill/high-pay” segments, which in turn will lead to an increase in social tensions.”

—Klaus Schwab, Founder of the World Economic Forum

Source: Schwab 2016.

in countries with good fundamentals. Output growth is the most important determinant of employment growth. Using fiscal and monetary policies whenever possible to support the economic recovery and sustain growth can help reduce uncertainty. It also makes firms more inclined to invest and recruit in economies where there is no lingering excess capacity.

In many African countries, there is little room for active monetary policy to boost aggregate demand, especially when interest rates are already relatively low. When the inflation threat is not too severe, central banks can prudently resort to unconventional monetary policy tools to provide an enabling environment for business development. Monetary policy can also have large and long-lasting effects on real interest rates, and by implication, on output or unemployment. Furthermore, a sustained increase in real interest rates induced by monetary policy can affect not only the actual unemployment rate but also the natural rate: Unemployment puts pressure on wages even when bargaining is only between employed workers and firms. Many unemployed college graduates throughout the developing world eventually give

up their search or lose the skills gained from education. As a consequence, sustained high unemployment will lead to an increase in the natural rate itself. When monetary policy can affect real interest rates for a long period, it can also affect the natural rate of unemployment through capital accumulation. Real interest rates affect the cost of capital, the cost of capital affects capital accumulation, the capital stock affects the demand for labor, and the demand for labor affects unemployment.

Adopting a macroeconomic framework specifically geared toward employment creation makes active labor market programs (such as training, employment subsidies, support with job matching and job applications) much more likely to lead to positive results. In some countries, there may be room for well-targeted fiscal measures that can increase economic output and job possibilities. For example, direct employment creation (that is, temporary jobs through public works) would have a stabilizing effect in a climate of heightened sociopolitical tensions. Governments should refrain from hiring the unemployed directly but contract instead with private firms or nonprofit organizations to provide jobs. Vulnerable groups

and people in the poorest regions and industries should be the targets of such measures.

In addition to providing much needed income to people, typically the urban poor, well-targeted public works in infrastructure (new investment, repair, or maintenance) remove bottlenecks to growth and create the conditions for increased productivity. Accelerating the implementation of shovel-ready, labor-intensive, productive infrastructure projects should be a priority. Spending on productive infrastructure that removes bottlenecks on growth (with good rates of return) and spending on operations and maintenance can both boost demand and generate sources of growth in the longer run. Evidence from empirical work on Latin American and Caribbean countries suggests that infrastructure investment can have a sizable impact on employment generation.⁵⁴ It is true, however, that they may crowd out some private sector jobs, especially if the targeting is ineffective. Salary levels should therefore be set carefully so that these programs are cost-effective.

Wage subsidies can also be considered for industries that are clearly competitive but facing temporary shocks. They allow employers to keep employees on their payroll that they would otherwise lay off for economic reasons and also to hire young workers or women by paying part of the salary for a given period. Wage subsidies allow such workers to acquire or develop important skills that eventually provide long-term employment. But because some employers may view subsidies simply as a temporary source of cheap labor, the risk of deadweight losses should also be considered. Governments should therefore be prudent in determining the subsidies' level and duration because extensive reliance on public sector employment as a source of jobs and income often produces deep social and cultural consequences, and even hysteresis. Some regions can be caught in an equilibrium of dependency in which public sector jobs become the only source of income and opportunities for private sector development do not materialize. This creates a vicious self-fulfilling circle whereby

entrepreneurship is discouraged while dependency on government for livelihood is enhanced. The result is often the creation of powerful political constituencies of public sector employees and unions who oppose labor market reforms.

Training programs to help new and laid off workers gain or regain skills could contribute to increased productivity if such programs target the neediest groups (youth, disadvantaged, women). Youth-oriented programs designed in close collaboration with private firms to assess demand for skills and to provide tailored training programs can yield good results. To ensure the maximum chance for success, they should be tailored to the business needs of the potentially competitive industries in each country.

PUBLIC WORKS FUNDED IN PART BY REGIONAL DEVELOPMENT BANKS

The need to fund infrastructure projects is particularly important because the benefits to society as a whole are typically much larger than the private financial return is to the owner. Yet, let alone, private investors would not necessarily finance them. Moreover, the process through which public infrastructure projects are selected and funding is allocated—especially in low-income countries—makes them subject to political pressure and elite capture. In authoritarian and unstable countries, the weak institutional framework, fuzzy budget rules, lack of transparency and accountability mechanisms, and the need to accommodate political cronies at all government levels and beyond can lead to random and costly decisionmaking.

At the macroeconomic level, overall investment and spending must be increased in all low-income countries to accelerate growth, create employment opportunities, and combat poverty. Some developing countries' central banks have stimulated the economy through monetary policy—especially during the recent global downturn—by lowering interest rates and reserve requirements or purchasing government bonds held by financial

BOX 6

Public debt for employment-generating infrastructure?

A large number of reports and media outlets have recently discussed debt sustainability in Africa and its implication for macroeconomic stability. It is indeed critical that African policymakers keep debt dynamics in mind as they carefully consider changes in macroeconomic policies to finance the infrastructure their economies need to boost growth and generate employment. The main finding and dominant narrative from these analyses and commentaries is that an increasing number of African countries are in debt distress, and urgent action is needed to stop or drastically reduce the pace of indebtedness.

However, most of these commentaries start from the position that high debt is necessarily bad, and conclude somewhat ideologically that economic policy in African countries should only be geared at curbing the rise of public debt. They often offer generic accounting frameworks and basic, rigid, and static “prudential” ratios for deciding whether the debt is sustainable, without discussing the economics of debt, and its underlying dynamics. Public debt carries costs and potential benefits, to be carefully analyzed in a balanced manner, taking into account each country’s specific context and prospects, and the specific debt conditions.

Africa’s mean general government debt (weighted by nominal US dollar GDP) has indeed climbed, reaching 54 percent of GDP in 2017, up from 30 percent in 2008. This occurred in the context of historically low global interest rates. Africa’s public and publicly guaranteed external debt has increased significantly in dollar terms since 2008, rising from around \$200 billion to about \$390 billion by end-2016.

The rising debt in recent years is not unique to Africa, but a widespread global phenomenon, which reflects both the outcome of the fiscal response to the 2008 global financial crisis, and the aftermath of a protracted slowdown in global growth, which increased the burden of legacy liabilities. For emerging and developing countries, the increase in financing was compounded by rising infrastructure needs, a fall in commodity prices in 2014–15, and increased security challenges.¹

Two types of costs are generally associated with high public debt: the fiscal costs, viewed as implying the burden of repayment through high distortionary taxes at some point in the future, and the fear that debt crowds out savings and decreases capital accumulation, with negative implications for future growth and consumption.

Recent work by some of the world’s leading macroeconomists (most notably former IMF chief economist Olivier Blanchard) challenges these usual theoretical arguments against public debt. Debt may actually have no fiscal cost at all because today’s interest rates are low, lower than growth rates, with 10-year projections of nominal growth rates higher than forecasts of interest rates by 1–2 percentage points. The newest IMF forecasts from the April 2019 Fiscal Monitor and the numbers are overwhelming: projections of interest rate-growth rate differentials over the period 2019–24 are negative for about 90 percent of the countries surveyed, including some African countries like Algeria –5.1, Angola –3.6, Egypt –5.0, Morocco –1.9, South Africa 0.5.²

Blanchard (2019) develops four main arguments for the costs of public debt when safe interest rates are low. First, the current global situation of safe interest rates expected to remain below growth rates is more the historical norm than the exception. Debt rollovers—the issuance of debt without a subsequent increase in taxes—may therefore be feasible, lacking a fiscal cost. *(continued)*

Second, even without fiscal costs, public debt reduces capital accumulation and may therefore have welfare costs, though these may be smaller than typically assumed. The reason is that the safe rate is the risk-adjusted rate of return on capital. A safe rate lower than the growth rate indicates that the risk-adjusted rate of return to capital is low. The average risky rate, that is, the average marginal product of capital, also plays a role, however. Blanchard shows how both the average risky rate and the average safe rate determine welfare outcomes.

Third, while the measured rate of earnings has been high, the evidence from asset markets suggests that the marginal product of capital may be lower, with the difference reflecting mismeasurement of either capital or rents. This matters because the lower the marginal product, the lower the welfare cost of debt.

Fourth, Blanchard discusses arguments opposing high public debt, in particular the existence of multiple equilibria where investors, believing debt to be risky, require a risk premium, which increases the fiscal burden and makes debt effectively riskier. This argument, while relevant, does not have straightforward implications for the appropriate level of debt.

Moreover, fiscal sustainability does not simply entail the government's ability to finance itself. It also requires fiscal and monetary policies to be consistent with the expected growth, inflation, and interest rates. Sustainability does not necessarily require the government to be able to pay off its debt in the long run. It implies that real debt increases only at a rate less than the real interest rate paid on it. In other words, the government is accountable for the net real interest rate (real interest rate, r , minus the real growth rate, μ) paid on the debt to GDP ratio, b_0 . This can be financed either with a primary surplus $g-\tau$, or with seigniorage revenue, which is represented by the inflation tax paid on the money demand to GDP ratio, $L(r+\pi)$ which is a decreasing function of nominal interest rate, $(r+\pi)$.


This sustainability condition can be represented as:

$$(g-\tau) + (\pi+\mu) \cdot L(r + \pi) = (r-\mu) \cdot b_0$$

Beyond the debt, the critical question is whether the primary fiscal balance is in line with this long-run sustainability condition. Without such analysis of the economics of public debt as an integral part of the toolkit for development finance, policy prescriptions to stop indebtedness lack analytical basis. Unemployment and underemployment are economically, politically, and socially very costly. In some specific cases, taking into account the macro-financial situation of the country, its growth prospects, and the conditions and terms, public debt can be prudently used to support employment-generating infrastructure in industries with clear competitive potential. Borrowing at low interest rates to finance employment-generating infrastructure in productive industries is generally an appropriate economic strategy.³

Notes

1. African Development Bank 2019a.
2. IMF 2019: Annex A24 on p. 106.
3. Summers 2014; Summers 2017.



institutions to make more resources available to the banking system (quantitative easing). But most conceive their role as maintaining price stability, which they consider the best way to contribute to economic growth. Economic conditions in many developing countries remain slack, and high unemployment and underemployment persist. The consistently high capital flight from poor economies, a phenomenon also accompanied by a new buildup in external debt, reflects the challenges.⁵⁵

In crisis situations where private sector confidence and investor willingness to take risks and to spend are low, the traditional Keynesian strategy consists of complementing loose monetary policy with higher public spending or lower taxes. Restoring aggregate demand through government action is then seen as the most effective way of replacing private spending that has not taken place. Most high-income countries have done just that to combat the 2008–09 global recession. But that strategy may well work for business cycles and fail when it comes to confronting growth and development structural issues of the types facing low-income countries. Moreover, the still dominant conventional wisdom—codified mainly in the old multiyear macroeconomic programs that poor countries used to negotiate under duress with the IMF—is one that advocates “expansionary fiscal contraction.”

Developing economies currently find themselves in a conundrum: Aggregate demand is still too low, and there is no realistic expectation that it will increase sufficiently and rapidly enough to provide enough employment opportunities for poverty reduction. But it is financially, economically, and even politically impossible to increase government deficits—not least because of IMF program constraints. And even if central banks were willing and able to implement extraordinarily loose monetary policies, it would not be effective enough to produce high, sustained growth. What is therefore needed is a development financing strategy that sustains demand without creating unsustainable fiscal deficits.

A more viable solution to credit financing for economic development would be to strengthen

development banks and public investment banks. Well-functioning development banks help countries meet two objectives simultaneously. They provide much needed long-term financing to economies, contributing to expanding and modernizing infrastructure (energy, transportation, telecommunications, water supply), and they maintain sustainable fiscal balance. Reinforcing such banks’ financial and economic role would not require developing country governments to substantially increase their borrowing. Rejuvenating public investment and development banks would stimulate confidence by supporting large-scale, regional investment projects and programs that create employment opportunities. But those investments would be made by the private sector or by some local governments, with the necessary funding borrowed or raised by the investment and development banks—not by central governments.⁵⁶

Revitalizing these financial institutions would go a long way toward addressing the short-term market failures in private capital markets that prevent poor economies from getting funding for their development projects. By making long-term finance available for sound investment, investment and development banks could support new export industries that reduce dependence on foreign borrowing to finance foreign products. Governments could use them to secure special credit lines and to provide incentives to commercial banks to offer in turn more favorable borrowing terms to firms in potentially competitive industries and sectors. This would also open new possibilities for the development of new products and services by commercial banks (including insurance facilities against exchange rate risks).

Some researchers have argued that low investment has not been the major constraint on development in poor regions of the world, particularly in Africa.⁵⁷ Africa’s total investment rate has been below that of other developing countries, but public investment rates are often not that much lower. “Any statement about whether African investment was the source of poor performance would therefore have to analyze the composition of that

investment—and whether more public investment, an instrument under government control, would have benefited the continent.”⁵⁸ Although development and public investment banks have a poor track record across the developing world, it must be noted that these failures could again be traced to the blind pursuit of capital-intensive (modernization) projects that were not economically viable in the first place or were poorly managed and not upgraded to reflect changes in the economy’s endowment structure.

Learning from past failures and successes, the new development finance institutions would operate on a “not for profit maximizing” basis and borrow on the capital markets to finance economically viable projects in potentially competitive industries and sectors. They would offer partial or full guarantee of repayment of bonds issued by investment projects by bearing the risk and therefore reducing substantially the cost of funding. Newly revamped development finance institutions working with a rigorous, professional, and transparent operational framework would also issue their own long-term bonds with a modest premium over U.S. T-bills to raise money and finance large-scale projects directly. Good institutional and governance strategies would allow development and public investment banks to fund major infrastructure projects while consistently avoiding losses and maintaining a very low delinquency rate.⁵⁹

Access to stable financing at reasonable cost is a prerequisite for firm performance and economic growth. At the microeconomic level, local manufacturers in potentially competitive industries still need to pay upfront in foreign currency for their imported equipment and inputs and to bear the often heavy costs of the exchange rate risk associated with a depreciating domestic currency. So, they are hesitant to make the kind of large purchases that they would need to become viable producers on the global scene. Local banks in most developing countries do not grant preferential interest rates to large-scale investors, and the rates of interest are quite high (typically more than 20 percent).

Simplifying trade procedures, increasing transparency and predictability of trade policies, and reduce the cost of border formalities can also help create employment across Africa.⁶⁰ Most developing economies need to review their required import and export permits and licenses and reduce the costs of obtaining them, and they should implement standard border policies as well. In addition, specific issues that pertain to small cross-border traders could be addressed to provide a clearer route to more effective formal trading arrangements. This is not necessarily an agenda of deregulation but rather one of delivering better regulation that allows government to achieve its public policy objectives but minimize the constraints to trade in doing so. This would require the involvement of traders, producers, and consumers in discussions about regulations that affect trade. On export bans the government could commit to precise notification procedures, both nationally and regionally, before restrictions on exports are implemented and make clear that bans will be implemented only if strategic reserves fall below a certain level (say, a three-month supply).⁶¹

BUILDING CLUSTERS THROUGH INDUSTRIAL PARKS AND SPECIAL ECONOMIC ZONES

After identifying potentially competitive industries that can absorb the existing labor force, and designing viable public-private partnerships strategies for removing obstacles to their development, the next major step is to concretely address cross-cutting issues (such as poor infrastructure, poor governance, rigid labor laws, and costly skilled labor for small market size) that impede domestic and foreign investments. Given the political-economy challenges of implementing labor market reforms for an entire country, some particular measures with quick potential payoffs can be implemented initially in specific geographic zones.



How best to do this?

Traditional development policy prescriptions provide that governments implement reforms to improve the business environment so that potential investors find the optimal conditions for creating formal sector employment. The blueprint for these prescriptions can be found in the World Bank *Doing Business* report, published annually. “By gathering and analyzing comprehensive quantitative data to compare business regulation environments across economies and over time, *Doing Business* encourages economies to compete toward more efficient regulation; offers measurable benchmarks for reform; and serves as a resource for academics, journalists, private sector researchers and others interested in the business climate of each economy.”⁶² *Doing Business* also offers detailed subnational reports, which exhaustively cover business regulation and reform in different cities and regions within a nation. These reports provide data on the ease of doing business, rank each location, and recommend reforms to improve performance in each of the indicator areas. Cities can compare their business regulations with other cities in an economy or region and with the economies that are ranked.

The *Doing Business* project is undoubtedly a very rich and useful information source for all policymakers concerned about binding constraints on economic growth and job creation. It provides a comprehensive assessment of what is wrong with African economies in any given year, but policymakers have noted that the reforms it identifies for action do not necessarily generate employment or economic growth. This is because it randomly grants importance to all alleged obstacles to firm growth and productivity. It gives equal merit to “objective” problems subjectively identified and reported, often mixing up causal factors and policy consequences. Moreover, it always recommends lengthy lists of reforms to be carried out without clear criteria for prioritization. It is therefore not surprising that the top-performing economies in the world in recent decades (including in job creation) tend to rank poorly in the *Doing Business* report.

Developing countries are by definition places with suboptimal business environments—there is no poor country with excellent *Doing Business* indicators. It should indeed be the goal of policymakers there to undertake the reforms necessary to remove the constraints on growth and job creation. But infrastructure development for instance is by definition highly capital-intensive and quite costly. Building high-quality roads, ports, airports, railways, and electricity, water, and telecommunications systems across an entire country is also politically difficult, especially in countries with insufficient administrative capacity.

All African countries will need time to successfully undertake all the reforms necessary to make their business environments, infrastructure quality, governance institutions and regulation, and national systems for delivering public policies, meet the standards of Singapore or Switzerland while maintaining social peace. Time is also a requirement to address the capacity deficit and to solve the issues making the business environment unattractive. Today’s top-performing economies in the *Doing Business* rankings did not get there overnight. Yet, time is of essence for developing-country political leaders.

Under such circumstances, the more pertinent strategy for growth and job creation is to devote the country’s limited financial and administrative resources to the implementation of reforms in policy and geographic areas where visible quick wins can be achieved (box 7). Observable positive results in the creation of labor-intensive industries would also open up the political and policy space to gradually implement even the most difficult reforms.

Identify the *most binding constraints* to be lifted through government action or changes in policy if these potentially competitive industries are to be successful—that is, policymakers should be given a realistic and manageable reform agenda, not the typical and lengthy “improve the business environment” recipe, requiring many politically difficult reforms.

BOX 7

Prioritizing the many constraints to job creation and growth

For any government—especially in a developing country—sorting out the many constraints to firm development that emerge from all kinds of studies is a major challenge. Not all obstacles to job creation and firm performance have equal importance. In fact, some apparent issues identified in surveys and analyses as “major obstacles to growth” are often symptoms or consequences of other problems that may deserve more attention.

One way of sorting out the long list of obstacles and setting priorities in a reform program is to place the many impediments to sustained growth into one of two types of obstacles:

- High factor costs (often due to bad policies and regulations implemented in the past and structural rigidities such as land policy).
- High transaction costs (often due to bad infrastructure and poor governance).

Such simplification offers strong theoretical advantages, because it uses simple Ricardian models based on international comparisons of unit labor costs to assess international competitiveness. The relative unit labor cost (comparative measure of the ratio of wages to productivity) is indeed an essential relative price in the Ricardian model of trade and as such provides a coherent basic framework for understanding the main macro- and microeconomic determinants of trade flows.¹ As noted by Edwards and Golub “in a world where capital is mobile and production is footloose between countries, it is the relative price of nontradable inputs, notably labor, rather than outputs that matters.” (2004, p. 1326).


For policymakers in developing countries, it also has several practical advantages: First, it reduces the broad determinants of firm performance and growth to just two categories (competitiveness in factor costs and competitiveness in transaction costs). Second, it highlights that despite their poor business environments, almost all low-income countries still have lower factor costs than more advanced economies, opening a window of opportunity for smart, targeted reforms and policies with big potential payoffs. And finally, by forcing policymakers to focus their diagnosis and attention on just two broad categories of constraints, they can focus on formulating policies that can actually be implemented in countries with low administrative capacities—most notably through building clusters and industrial parks, as discussed later.

Private sector analysts, academic researchers, and policymakers could then carry out detailed value chain studies (for products already produced locally) and feasibility studies (for products not yet produced locally), focusing specifically on industries where the country has potential comparative advantage. Such studies should:

- Examine global trends, market forces (productivity of the main producers and competition) and the development prospects in the world product market.
- Review the structure of the country’s product markets—including through a mapping of firms and their capabilities to identify areas where the capacity of the private sector can be leveraged (such as good practice companies and industrial clusters, including informal ones) and where it needs to be built (for example, key missing links along industry value chains).
- Assess the key features, strengths, and weaknesses of the country’s existing supply chain for the product based on a benchmarking of key productivity and cost factors (for example, labor, capital, and inputs) against those in comparator countries.
- Assess the overall economic efficiency of domestic production of the product in relation to world prices using alternative cost projection scenarios to establish current- and medium-term competitiveness.

Note

1. See Dornbusch and others (1977) for the general formulation, and Monga (2013) for an extension of the model in developing economies that use labor arbitrage to industrialize.



Special economic zones (SEZs) are the most effective institutions for generating decent employment in potentially competitive industries (while taking the time necessary and often long to identify and address the truly binding constraints identified in the Doing Business reports), especially industrial parks (IPs) and other closely related institutions such as special agro-processing zones (SAPZs).⁶³ They can be used effectively to gradually address many difficult economy-wide constraints on job creation.

SEZs and IPs provide special policy incentives and infrastructure in a circumscribed geographic location to firms that can attract foreign direct investment, create jobs, develop and diversify exports (even when economy-wide business environment problems and protective barriers are not yet resolved), increase foreign exchange earnings, and serve as “experimental laboratories” for new pricing, financial, or labor policies. SEZs and IPs are more likely to produce increasing returns (economics of agglomeration), arising from localizing industries. These increasing returns, mainly in the form of localized external economies, allow for large-scale production.

That process is sustained by the agglomeration effects observed in 19th century England and described by Marshall:⁶⁴ information spillovers, specialized suppliers, and deep labor markets (geographical concentration of the skilled or unskilled workers needed by the various industries). In sum, industrial parks and export processing zones can generate direct benefits from export growth and export diversification, employment and income generation, foreign direct investment, foreign exchange and government earnings, and indirect benefits such as technology transfer, skill upgrading, and knowledge spillovers that eventually translate into productivity increases across the entire economy.

Policy incentives in SEZs typically include import and export duty exemptions, streamlined customs and administrative controls and procedures, facilitated access to foreign exchange, and relatively

low income tax rates. A special regime of labor laws and regulations can be granted to firms operating in industrial parks that allow more flexible hiring and firing practices and/or wage and benefit systems that will reduce their transaction costs.⁶⁵

Export-oriented SEZs and IPs can also be very effective in boosting employment generation. They are intended to “convey ‘free trade status’ to export manufacturers, enabling them to compete in global markets and counterbalance the anti-export bias of trade policies.”⁶⁶ For instance, several African countries that successfully established export-processing zones have benefited by gaining entry to the African Growth and Opportunity Act (AGOA) market in the United States.⁶⁷

But creating an SEZ is not in itself a panacea to solve the infrastructure deficit in a developing country. There have been many examples of disappointing experiments across the developing world, and policymakers should carefully review the blueprint and requirements for success.⁶⁸

SAPZs (in some instances also known as agro-industrial parks, agribusiness parks, mega food parks, agropoles, and agro-clusters) are agro-based spatial development initiatives designed to concentrate agro-processing activities within areas of high agricultural potential to boost productivity and integrate production, processing, and marketing of selected commodities. These initiatives may or may not be granted SEZ status. They are purposely built shared facilities to enable agricultural producers, processors, aggregators, and distributors to operate in the same vicinity to reduce transaction costs and share business development services for increased productivity and competitiveness. They include facilities that are connected to farming communities and provide critical services to farmers, including crop drying facilities, cold stores and warehouses, farm equipment rental and maintenance services, crop handling, grading, storage, and processing for increased shelf life; livestock handling, slaughtering and meat packing; fish handling, grading

and processing; food quality and safety control and certification; distribution and marketing platforms.

By bringing adequate infrastructure (energy, water, roads, ICT) to rural areas of high agricultural potential, and encouraging the concentration of skills (even from firms competing against each other), SAPZs they attract investments from private agro-industrialists/entrepreneurs to contribute to the economic and social development of rural areas. Their ultimate objective is to transform the African rural landscape into economic zones of economic dynamism and prosperity. They are intended to lay the foundation for Africa's agro-industrialization, create employment, and contribute to lifting people out of poverty.

SAPZs are of particular relevance in strategies to ignite and sustain economic growth in Africa. They are geographical enclaves—preferably in rural areas, not far from production zones—where public investment in industrial infrastructure can attract and facilitate foreign investment, integrate farmers and local firms into global value chains, promote export-oriented growth, and generate employment. And by boosting agricultural productivity and value addition in the agriculture, livestock, and fisheries sectors, they can reduce food imports and diversify the economy.

The ownership and management of the well-functioning is typically an independent entity, often in a public-private partnership arrangement. Key success factors for SAPZs include:⁶⁹


- A well-defined, centrally managed tract of land developed, subdivided, and dedicated to supporting firms and other stakeholders engaged in agro-processing and related activities located throughout the production area surrounding the zone.
- Excellent governance within the zone and appropriate policy and regulatory framework and supportive business environment sustained by legislation and official documents describing the national development strategic framework in which they fit. Effective

one-stop-shops for business formalities and services are highly attractive to investors.

- Private sector leadership based on government facilitation and mobilization of investments. This requires strong political will and discipline to avoid policy reversals due to changes in government, and active promotion of the initiative by very senior champions in the public and private sectors.
- Important, patient, and inclusive financing accessible to all actors, including small producers and small and medium enterprises operating in the zone.
- Quality infrastructure, logistics, and specialized facilities and services at competitive cost required for agro-industrial activities (such as electricity, water, cold chain facilities, laboratory and certification services, business services, ICT, and waste treatment).
- An effective management system to ensure rapid identification of bottlenecks, find solutions, regularly share information to build trust among all actors, and facilitate the resolution of conflicts should they arise.
- Skills and capacity development programs jointly designed by governments, the private sector, academic institutions, and civil society groups (including rural organizations).
- Connectivity of zone actors to each other and to global markets in an integrated value chain approach, and a governance system that facilitates trade agreements and conflict resolution for successful value chains.

BUILDING SKILL ENHANCEMENT ZONES FOR CAPACITY DEVELOPMENT

Many taxi drivers in Algiers (Algeria) hold graduate and even post-graduate degrees in the humanities and in the social sciences. In Douala (Cameroon), many “Bensikineurs” (motorcycle taxis) also hold degrees from advanced tertiary education, including in math and sciences. They graduated with what they thought were great degrees from



local colleges and universities. Surely, they did not anticipate that they would spend several years learning complex subjects and mastering valuable skills, just to end up spending their days in second- or third-hand cars and motorcycles on the streets, and often risking their lives in activities completely unrelated to their acquired knowledge. Because they could not find attractive jobs in their field of expertise, they settled with taxi or motorcycle driving, which they hope will be a temporary source of revenue. Some of them graduated from public colleges and universities. Others went through private institutions where they paid expensive tuition, using personal savings or borrowing money from family and friends. Yet, after their training, their skills sets do not appear to be in great demand in the labor market.

These suboptimal situations are not unique to Algeria or Cameroon. Skill mismatches are prevalent and costly features of African labor markets. Yet, in industries where there is demand for skilled labor, investors also often point to skill shortages, weak human capital, and rigid labor laws as constraints to firm performance. Meanwhile, governments devote increasingly larger amounts of the countries' meager resources to finance public schools, colleges, and universities. Families also use their savings to support their youth and ensure that they receive good education and training.

Most African countries have indeed invested resources over the decades to achieving quality education, considered the pillar of national development. Despite their low revenue per capita, African countries have by and large managed to maintain a steady allocation of resources to higher education since the mid-1990s. On average, the continent has devoted 0.78 percent of its GDP to tertiary education, compared with 0.66 percent on average for other developing countries and 1.21 percent for OECD countries.⁷⁰ African governments also allocate about 20 percent of their current education spending to higher education, a rate higher than non-African developing countries (18 percent).

Yet, they still exhibit weak human development indicators and largely unsatisfactory educational outcomes. The education quality is often poor, the curricula outdated and graduates lack the skills to land exiting job offers in many industries and sectors. Because of demographic trends, the demand for higher education has been increasing faster than African governments' funding capacity. Performance and cost indicators in higher education are of particular concern in Africa where most public universities and colleges are currently understaffed, underfinanced, and in poor operating condition. The decline in financing may have led to the deterioration of outcomes.

Traditional, generic policy measures to address these problems and equip Africa's labor force with the skills to meet the demand in competitive modern industries where the continent has good jobs prospects have had disappointing results. There is thus a need to complement improvements in the education curricula in academic institutions with better-targeted skill and capacity development programs to directly respond to the market demand for labor. To carry out this broader and more practical agenda, African countries should create skills enhancement zones where governments, the private sector, academic institutions, and nongovernmental organizations collaborate on the design and implementation of medium- and long-term workforce development plans for selected industries with strong competitive potential (mainly agroindustry, light manufacturing, and tourism). They are public-private centers where (mostly) young people are exposed to wide set of skills across sectors, connected to industrial clusters, and prepared for entrepreneurship.

The main goal of these skill enhancement zones should be to develop practical and implement programs to quickly build the workforce needed in all the critical segments of the value chains of the country's competitive industries. Their strategies should be tailored to build human capital in specific groups:

- For existing workers, the focus could be to address shortfalls in skill-specific technical

areas, and to provide pathways into agro-industry, manufacturing, and services.

- For new labor force entrants, the focus could be to improve the effectiveness of high school-to-work pathways—the type of basic assembly work in many light manufacturing activities that only requires high school-educated workers. By expanding pre-employment and pre-occupational places, the strategy would provide firms with work-ready new entrants and help them face less difficulty in attracting new entrants.
- For women, whose contribution to effective poverty reduction strategies in developing countries has been shown empirically,⁷¹ specific tasks and a more flexible and positive work environment should be created to attract them in large numbers into labor-intensive industries.
- For the many unemployed youth in rural areas where modern agriculture and light manufacturing industries can emerge, the skill enhancement zones would provide opportunities for training and employment.

African countries should also use these centers to refocus their vocational training on industries in which their economies have clear or latent comparative advantage. The launch of vocational institutions is generally a major step in the drive to produce skilled workers in high demand in booming industries. But such vocational institutions are often costly and depend on donor funding, which can be volatile. Training could be provided both on the job (especially for agriculture/agribusiness, light manufacturing, and tourism) and in training schools. With the provision of knowledge and skills linked to acquiring the necessary job experience, trainees would learn to cope with the job's constantly changing demands and to acquire precious “soft” skills.

Job search assistance and employment services can help match jobs and job seekers. They are usually inexpensive and can reduce the length of unemployment. But they typically benefit only a small number of active job seekers. Promoting access to the information and communications technologies (ICT) sector could help remove

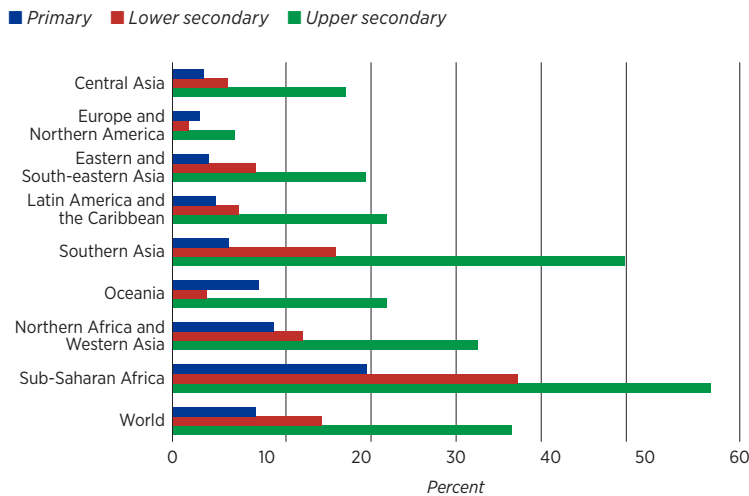
supply- and demand-side constraints in the labor market. Young people are the biggest consumers of technology, which they can use to enhance their skills, seize opportunities, and connect to a global audience. Well-targeted policy measures to provide disadvantaged groups with access to ICT (IT alphabetization, investments to create ICT communal areas for rural youth and women, and so on) could foster the emergence of new economic activities and generate employment.

Governments and private companies working together alongside academic institutions and NGOs in skills enhancement zones can also launch and finance effective job-training programs which can groom young people for the demands of a global economy that demands more and more highly skilled workers. When such programs are well targeted to young workers with employment potential, their broader economic effects can be substantial.⁷²

WELL-TARGETED APPRENTICESHIP AND JOB TRAINING PROGRAMS

In today's rapidly changing global economy, it is more important than ever to prepare workers to fill both existing formal sector jobs and to prepare workers for the jobs of the future. However, Africa's education systems and workforce development strategies and policies are in need of reform. Of world regions, Africa has the highest rates of education exclusion. According to UNESCO, more than one-fifth of Sub-Saharan children between the ages of about 6 and 11 are out of school (figure 5), followed by one-third of youth between the ages of about 12 and 14. According to the UNESCO Institute for Statistics, almost 60 percent of youths between the ages of about 15 and 17 are not in school. Across Sub-Saharan Africa, an estimated 9 million girls between the ages of about 6 and 11 will never go to school at all, compared with 6 million boys. “Their disadvantage starts early: 23 percent of girls are out of primary school compared to 19 percent of boys. By the time they become adolescents, the exclusion rate for girls is

FIGURE 5
Out-of-school rate by region and age group, 2016



Source: UIS/UNESCO.

36 percent compared with 32 percent for boys.⁷³ Without urgent and well-targeted action, the situation will likely get worse as the region faces rising demand for education due to a still-growing school-age population.

Higher education, which absorbs only a tiny fraction (typically less than 5 percent) of the cohort of students who graduate from primary school, is becoming less affordable, and its outcomes are often viewed as substandard. And many colleges and universities fail to help students graduate with the skills necessary to compete for high paying jobs in today’s workforce.⁷⁴ Far too many graduates today (among the few who complete high education) find themselves with costly diplomas and degrees, and no direct connection to jobs. They often lack the most relevant academic skills and the career skills to get a good job. This translates into lost productivity immediately and in the future.

The lack of skills or skills mismatch affects not just students and youth. In many industries across Africa, workers already holding formal or informal sector employment find themselves with obsolete skills. In the small formal sector of the economy, many workers are often left behind or dismissed because their employers find them incapable of

adjusting to the new demands of the constantly changing business and industrial upgrading.

Against this background, education and workforce development programs must be reassessed across Africa. To ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (Sustainable Development Goal 4) and address the gender gap in education, governments, private sector entrepreneurs, donors, and civil society groups must work together and implement practical solutions, with special efforts to reach the most marginalized children and youth.

Traditional colleges and universities are an essential path to good jobs and prosperity, but not the only path. There should be renewed focus on expanding access to and participation in apprenticeships—not only among students at accredited secondary and post-secondary educational institutions but also on absorbing high school and college dropouts involved in low-productivity informal sector activities. The public policy objectives should not be to mechanically “pigeonhole” students on the existing educational tracks but to encourage and mentor them to choose what is best for them in the context of the prevailing economic circumstances and medium-term prospects.

In the best-performing economies, educators are increasingly emphasizing career classes, industry credentials, apprenticeships, and intern programs that fall under the heading “career-technical education.” In the United States, for instance, career credentials or industry certifications are increasingly seen as a sign of a meaningful high school diploma.⁷⁵ In addition, apprentices can obtain academic credit toward a college degree for the skills learned during their professional training. Government policy should thus support the efforts of colleges and other institutions of higher education to incorporate apprenticeship programs into their courses of study.

For workers already employed but facing the prospect of obsolete skills, job training programs should be considered. These are government-sponsored

BOX 8

Enhancing skills for agro-industrialization and entrepreneurship

Africa needs to quickly adapt its training systems to ensure that industry can reach its potential in transforming economies and creating employment albeit the rapidly youthful growing workforce.

Skill enhancement zones address the productivity and competitiveness of the human capital available to match industry aspirations. The zones develop a skilled workforce aligned to employer needs by creating demand-led training and upgrading economic-related skills to feed industry and job placement programs within industrial clusters. They further develop youth entrepreneurship capacities for uptake of business opportunities in industry value chains.

The zones target youth from 15 to 35 years old, with varying degrees of formal education, ranging from some secondary to higher education. Beneficiaries can also be youth who have acquired some level of skills through informal apprenticeships in the informal sector. Both urban and rural youth are reached, with a focus on areas where industrial sectors are established.

The \$78 million Ethiopia Integrated and Agro-Industrial Parks Project was approved in 2018. The Bank's contribution is \$15 million, with additional resources from the EU and Korea EXIM Bank. The project supports IAIP infrastructure and six supporting rural transformation centers, rural infrastructure to enhance agricultural productivity, and access to finance and youth entrepreneurship and employability skills in the agriculture sector.

The project will equip 6,000 youth with employable skills, support business development and growth for 40 youth-led micro, small, and medium enterprises, and create 200,000 direct and 600,000 indirect jobs by 2023. To date, 14 countries—Burkina Faso, Democratic Republic of Congo, Côte d'Ivoire, Egypt, Ghana, Guinea, Kenya, Liberia, Mozambique, Madagascar, Senegal, South Africa, Tanzania, and Zambia—are developing staple crop processing zones and agro-industrial parks over the next three years.


The skill enhancement zones are based on the dual vocational education and training approach to skill development. The system—which consists of theoretical and practical training—depends on close collaboration between educators and employers to ensure that the skills taught are useful for employers. The zones are adaptable to growth corridors and formal and informal industry clusters. They also promote stronger industrial collaboration at the regional level, with employers potentially working across several countries.

—Grace Vhuya Obeda

programs designed in close collaboration with the private sector to promote skills development or workplace readiness and increase the earnings or employability of workers (they do not include various forms student aid or student loan programs).

Apprenticeships, generally defined as arrangements that include a paid-work component and

an educational or instructional component for individuals to obtain workplace-relevant knowledge and skills, are a particularly effective solution to address many of the issues facing Africa's unemployed and underemployed youth. They aim at promoting affordable education and rewarding jobs, especially for youth. The duration typically varies between one and five years.



Degree apprenticeships can lead to valuable academic credentials such as a bachelor's or master's degree. They are run by both training providers and employers who pay a salary and the apprentice's tuition fees—individuals can earn and learn simultaneously.

For students and the youth, apprenticeship programs offer the benefits of a degree without the debt associated with a traditional college and university route. They combine hands-on workplace training with academic schooling, setting young people on the path of potentially successful careers. For employers, apprenticeships are low-cost instruments to plug skills gaps, attract and retain talent, and bring fresh thinking into the firm—especially when young apprentices bring substantial amount of innate digital talent to companies with much older workers. In sum, apprenticeships are really effective at bringing skills into a business and launching good careers. Apprentices gain a decent wage from their first day at work (a wage likely to increase over time as they learn new skills), knowledge with structured learning and on-the-job training, and an enhanced resume with industry-recognized credentials upon completion of the program.

Apprenticeships have often worked well, even in the most advanced economies where not all young people entering the labor force have been trained in traditional colleges and universities. For instance, well-designed and well-managed apprenticeships have been a key factor helping German companies remain world leaders in high-quality manufacturing in the face of intense global competition.⁷⁶ The German approach fruitfully combines several elements: training methods with proven effectiveness; strong and mutually-beneficial partnerships between private companies and educational institutions; and success in achieving buy-in from companies, even though firms have to make a financial commitment.

Other advanced economies such as the United States and the United Kingdom have also launched successful apprenticeship programs. In some U.S.

states such as North Carolina, high school counselors even hold “undecideds fairs” to expose students to job options other than four-year college. During such events, students hear pitches from prospective recruiters from the military, community colleges, and companies offering jobs right out of high school. Some of them take competitive exams in the hope of landing an apprenticeship with a salary, community college tuition (so that they can study specific subjects while working), and the path to a lucrative job.⁷⁷

Some African countries have tepidly launched similar programs, with less success.⁷⁸ The main reason is that they often followed the traditional policy recipe of implementing some generic reforms to improve their business environment, with the hope that this would allow employment opportunities to emerge randomly in the economy. Unfortunately, training workers for noncompetitive industries or for sectors without good prospects isn't enough to convince employers to recruit. Besides not being targeted to industries with actual or latent comparative advantage, some of these apprenticeship programs were not designed in close collaboration with the private sector, and not adequately funded. As a result, they could neither match unemployed young African workers with open jobs, nor prepare them to start their own businesses in promising new industries.

Revamping apprenticeships and reforming ineffective education and workforce development programs would help correct past policy mistakes, enabling more African youth with various levels of education to acquire relevant skills and high-paying jobs. When they are well designed (in collaboration with the private sector), well implemented, and supported by sustainable financing, apprenticeships provide paid, relevant workplace experiences and opportunities to develop skills valued by employers. They also provide credible and affordable paths to decent jobs and, often, the development of young entrepreneurs.

With appropriate regulations, job training programs can be developed by third parties such as

BOX 9

Should Africa worry about a brain drain? Probably not, but...

Developing country policymakers worry that the best and brightest Africans are being poached by rich countries, decimating skills critical for African development. Some scholars view the concern as exaggerated.

Easterly and Nyarko (2008) debunked many of the myths surrounding brain drain through framework that encompasses key economic agents and outcomes—individual utility, parental welfare, government provision of public services, long-term human capital, and economic growth. Their inability to establish a negative effect of brain drain on growth in Africa was anchored on the fact that the brain drain in Africa is not big enough to significantly influence the continent's skills gap. They find instead a brain gain to the migrants and their families back home through remittances, skill accumulation, and other indirect utility, all of which offset the cost of educating the brain drainer and the loss of skills to brain drain.

UNCTAD (2012), by contrast, finds that brain drain has adverse consequences, especially in health, education, science, technology, and innovation. Remittances do not offset the costs of educating people who leave, and high-skilled migrants share little knowledge with home countries, especially if the economies are not experiencing rapid structural transformation. While acknowledging positive effects of brain gain and brain circulation on development in LDCs, these benefits are found to be limited, below potential, and not automatic.

Evidence on the beneficial effects of migration is thus inconclusive, but benefits do exist for developing countries and are strongest in least developed countries. An important policy focus, therefore, should be to strengthen the processes at both the sending and receiving countries to increase the beneficial effects. With globalization and its associated freedom of movement to work and live in many parts of the world, there is less need to worry so much about brain drain. Instead, the focus should be on harnessing remittances and diaspora knowledge to build productive capacities in Africa, turning the drain into gain.


—Eric Ogunleye and Andinet Woldemichael

trade and industry groups, companies, non-profit organizations, unions, and joint labor-management organizations. Governments should promote apprenticeships to business leaders across competitive industries, including agro-industry, light manufacturing, infrastructure and public works, tourism and tradable services, ICT, e-commerce, cybersecurity, and health care.

To ensure transparency and proper targeting in the identification of industries and the selection of beneficiaries, and to mitigate the risks of state capture and waste of public funds, the regulations could allow for an independent committee of respected group of credible experts to assess the credibility and viability of the all proposed

apprenticeship and job training programs. Such a committee should:

- Assess the suitability of third parties to provide recognition to high-quality apprenticeship programs (industry-recognized apprenticeship programs).
- Establish guidelines or requirements that qualified third parties must follow to ensure that apprenticeship programs they recognize meet quality standards.
- Determine which industry-recognized apprenticeship program may be considered for expedited and streamlined registration under government sponsorship.
- Establish review processes for assessing applications and considering whether to provide



accreditations or deny registration under apprenticeship and job training programs—and terminate them as appropriate.

Like many regions of the world, Africa is undergoing deep sociopolitical transformation that reflects and stimulates the need and desire for profound economic change. The mostly underemployed young people who are taking the streets across the continent and often toppling well-entrenched authoritarian regimes in just a matter of days have many requests on their agenda, including good, decent jobs to help them escape poverty and live with dignity. Youth employment is indeed crucial to inclusive development and sociopolitical stability in the region, which has the world's youngest population together with the highest underemployment rate, and to global stability, peace, and security.

Economists have long attempted to design theoretical and policy frameworks aimed at optimal labor market conditions. But too often these intellectual ventures have focused on unemployment—a poor predictor of growth and economic performance—and have been tailored to suit the structure of advanced economies. While there has been a rich and vibrant economic literature on unemployment in developing countries, especially since the

1970s and 1980s, the models derived from it have not resulted in actionable policy recommendations that yield satisfactory results. Often designed for high-income countries where the labor market is relatively homogeneous, they have tended to focus on generic business environment issues and labor market institutions while strategies and policies to raise the demand for workers in competitive industries were neglected on the rationale that they would imply activist and inefficient industrial policies. Yet almost all economies that have succeeded in moving from low- to high-income status—especially the East Asian countries—have also proactively addressed employment creation by competitive private firms.

Despite their current many economic and political challenges, African countries can seize that opportunity—and win the jackpot—by identifying small numbers of well-targeted industries in which they have comparative advantage and building special economic zones, agro-processing zones, and industrial parks in which they can deliver low factor and transaction costs through high-quality infrastructure, excellent governance, and backwards and forward linkages that spark employment creation in the formal sector. Winning the battle for employment in Africa would bring infinite rewards to the continent and to the world.

ANNEX

A SIMPLE ANALYTICAL FRAMEWORK FOR LABOR ARBITRAGE

Why have African economies not attracted substantial manufacturing industries in search for competitive platforms of production? The question can be answered using a simple Ricardian model based on international comparisons of unit labor costs to assess international competitiveness.⁷⁹ At a disaggregated level, that framework provides a basic tool for understanding the main macro- and microeconomic determinants of trade flows. Applications of various versions of the model to the African context have almost always assumed that labor costs there are the central point of contention. The relative unit labor cost (comparative measure of the ratio of wages to productivity) is indeed an essential relative price in the Ricardian model of trade. Edwards and Golub even make the point that “in a world where capital is mobile and production is footloose between countries, it is the relative price of nontradable *inputs*, notably labor, rather than *outputs* that matters.” (2004, p. 1326).

It is useful to start with the traditional framework before explaining why a modification is needed. The typical approach, as in Ceglowski and Golub (2011), focuses on a_i as the unit labor requirement (or the inverse productivity) for a given sector or industry, i . It can be said that

$$a_i = \frac{L_i}{Q_i} \quad (1)$$

with L representing labor employment and Q the value added. Marginal productivity and hence a_i are assumed to be constant with respect to variations in L_i . The symbols w and e respectively denote the average labor compensation per worker and the exchange rate (domestic currency per unit of foreign currency). Then, the big assumption: that labor is the only factor of production (or that other factor costs do not differ across countries). The logical next step from such a big assumption is that average costs of productions are equal to unit labor costs (ULC), $a_i w_i$. Therefore, international competitiveness in sector i depends on relative unit labor costs ($RULC$),

$$RULC_i = \frac{a_i w_i}{a_i^* w_i^* e} \quad (2)$$

It follows that the home country would have competitive advantage in sector i when its unit labor costs are below those of its trading partners, meaning that $RULC_i < 1$. A rewriting of equation 2 provides a decomposition of relative unit labor costs into components that sheds light into policymaking:

$$RULC_i = \frac{a_i w_i}{a_i^* w_i^* e} = \left(\frac{a_i}{a_i^*} \right) \left(\frac{w_i}{w_i^* e} \right) = \left(\frac{a_i}{a_i^*} \right) \left(\frac{w_i}{w_i^* e_i^{PPP}} \right) \left(\frac{e_i^{PPP}}{e} \right) \quad (3)$$

where e_i^{PPP} represents the purchasing power parity exchange rate for sector i defined as the ratio of domestic to foreign price levels. A further substitution of the definition of e_i^{PPP} as $\frac{P_i}{P_i^*}$ into equation 3 highlights the decomposition of relative unit labor costs into relative productivity and relative wages (measured in a common currency). Lindauer and Velenchik (1994) followed a similar approach, but they too limit their analysis of labor costs, which are in reality only one aspect of labor arbitrage.

There are obvious advantages in using such a formulation: a country’s competitiveness (gains or losses) in relation to others is seen to depend on one or several of the following three elements: its labor productivity relative to others; its real wages relative to others or, equivalently, its relative nominal wages evaluated at e_i^{PPP} ; and the level of its domestic currency exchange rate relative to its purchasing power parity level.

The main problem, however, is that the relative unit labor cost framework is a very aggregate concept. It focuses on labor costs and labor productivity, and neglects other costs of doing business—such as infrastructure (transportation, electricity, water, telecommunications), access to capital, availability of human capital, rent-seeking, and state capture—which are assumed to be embodied in the production function. The rationale often given for excluding such important costs

is that the limitation is mitigated insofar as the availability and costs of infrastructure, human capital, and other services influence labor productivity and consequently are reflected in relative unit labor costs. It is also assumed that the relative costs of nontradable inputs, especially labor, matter more for export competitiveness than the costs of tradable inputs such as capital and energy, which are viewed as equalized internationally.

These assumptions can be misleading. If things were so simple, lower-wage labor-intensive African economies such as the Democratic Republic of Congo, Ethiopia, or Tanzania would be attracting manufacturing firms from China, Brazil, and other emerging economies—and in large proportions. Moreover, in today's world, it is not just capital that is mobile: all factors of production are much more mobile than several decades ago. This includes skilled labor, which poor economies do not have in adequate supply. Therefore, engineers, talented managers, equipment repair technicians, and the like should be moving across boundaries to settle in poor African countries where their specialized skills are needed—as they do in many countries in the Middle-East. Clearly, there is more to the story of the determinants of delocalization decisions in global manufacturing than relative unit labor costs.

A more explicit and policy-relevant organizing framework would therefore go beyond unit labor costs to stipulate transaction costs, defined to include other important costs of doing business. Theoretically, it should be possible to compare unit production costs (UPCs) across countries, at least for homogeneous outputs, with lower UPCs predicting better performance in the sale of manufactured goods, or higher level of attractiveness for firms in need of re-localization of specific components of their supply chains. Unit production cost is defined as

$$UPC = \left[\left(\frac{w_m L}{Q} \right) + \left(\frac{Z}{Q} \right) \right] \left(\frac{1}{e} \right) \quad (4)$$

where w_m is more specifically the manufacturing sector wage, Q a physical measure of output, and

Z a vector capturing all other transaction costs needed for production and doing business in the country.

Equation 4 can be reformulated with a focus not on an aggregate but on the average product of labor, AP_L :

$$UPC = \left[\left(\frac{W}{AP_L} \right) + \left(\frac{Z}{AP_L} \right) \right] \left(\frac{1}{e} \right) \quad (5)$$

That formulation highlights three major factors influencing competitiveness, and therefore, determining the potential for any low-wage economy to attract industries that must be delocalized from successful emerging countries: the ratio of wages to productivity (the first term on the right side), the level of transaction costs per worker, and the exchange rate whose importance has too often been overlooked in the economic discourse on Africa.⁸⁰

The UPC formulation provides a broader picture of the conditions for labor arbitrage. It also lays out the policy framework that low-income countries should follow to reap the new benefits of globalization. The first term in equation 5 simply states that the ratio of wages to productivity is the main driving force behind unit labor costs, which are only part of unit production costs. Therefore, countries can be internationally competitive regardless of whether they are high-wage/high-productivity or low-wage/low-productivity—if they can maintain low unit labor costs. The second term in equation 5 indicates that the important factor that complements decisions about labor arbitrage and relocation of industries from high- to low-wage countries is the relative level of transaction costs per worker. The third term stresses the importance of the exchange rate, which should not be overvalued in low-income countries.

For African countries trying to attract these manufacturing employment opportunities that will have to be outsourced from China, Brazil, and

other emerging economies because of the steeply rising wages there, the policy prescriptions are relatively straightforward. In addition to exploiting their lower wage advantages, they should credibly ensure that the cost of doing business and exchange rate remain competitive. The question is how to do that in economies that have long suffered multiple and compounded distortions—sometimes over centuries.

NOTES

1. Monga 2019.
2. In the 2019 *Doing Business* report, China, which has grown by nearly double-digit for four decades and lifted 850 million people out of poverty during that time, was still ranked 46 (a big improvement from its ranking at 91 only five years earlier). Vietnam is ranked 69, behind such star economies as Kazakhstan (28), Azerbaijan (25), or Belarus (37).
3. Monga 1996, 1997a; Elbadawi and Makdisi 2017; Nabli 2019.
4. Golub and Fayaz 2015.
5. ILO <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?view=chart>.
6. ILO <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?view=chart>.
7. ILO-WB data.
8. The conceptual challenge here also hinges on issues of interpersonal welfare: who is to decide what is really an acceptable employment opportunity? Large segments of the labor force in developing countries tend to define themselves as unemployed even though they hold some type of provisional employment, which they sometimes hold purely for psychological reasons—to keep their mind busy—and not even for subsistence. While it still makes analytical sense to classify such people as “employed,” the reality is that they still perceive themselves as “unemployed” and would often behave as if they were completely. Many of them are young and educated, often with college degrees, and are at the forefront of sociopolitical uprising for jobs.
9. Golub and Hyatt 2015.
10. ILO WESO 2018 p. 11.
11. Fox and Gaal 2008.
12. The NEET rate stood at 26.1 percent in 2016 (ILO 2017).
13. Davis 2018; Assaad and Kraft 2015; McKinsey Global Institute 2015.
14. African Development Bank 2018a.
15. Duarte and Restuccia 2010; Herrendorf et al. 2014.
16. McMillan and Rodrik 2012; Gollin, Lagakos, and Waugh 2014.
17. Gollin, Lagakos, and Waugh 2014.
18. McMillan and Harttgen 2015.
19. Fox et al. 2017.
20. Eifert, Gelb, and Ramachandran 2008; Gelb, Meyer, and Ramachandran 2013.
21. Fox et al. 2017.
22. Lin and Monga 2017.
23. Monga 2006; Lin and Monga 2011.
24. World Bank 2014: 3.
25. Sachs 2015.
26. Basu and Basu 2015.
27. Source: World Development Indicators.
28. UNIDO 2016.
29. Rodrik 2016.
30. In the words of Davies, ‘world trade has lost its mojo’, and global trends support his observation. From 1990 to 2008 global real GDP expanded at an annual rate of 3.2 per cent, while world trade volume grew at 6.0 per cent. Since 2008, however, world trade has grown slightly slower than GDP, so the share of exports in GDP fell after a 25-year uptrend (Davies 2013).
31. Lin and Monga 2017: chapter 7.
32. Lin 2011.
33. Oqubay 2018.
34. Throughout the world, it is estimated that 445 million hectares of land are uncultivated and available for farming. About 201 million hectares are in sub-Saharan Africa, 123 million in Latin America, and 52 million in Eastern Europe. See Deininger et al. (2011).
35. Kim 2017; <http://www.worldbank.org/en/news/speech/2017/04/20/opening-remarks-by-world-bank-group-president-jim-yong-kim-wbg-imf-2017-spring-meetings-opening-press-conference>.
36. World Bank 2016.
37. ICFGEO; http://report.educationcommission.org/wp-content/uploads/2016/09/Learning_Generation_Full_Report.pdf.

38. Frey and Osborne 2013.
39. Acemoglu and Restrepo 2019; <https://www.project-syndicate.org/commentary/ai-automation-labor-productivity-by-daron-acemoglu-and-pascual-restrepo-2019-03>.
40. See, for instance, Stiglitz 2014; Sachs 2014; Berg 2014; Acemoglu and Restrepo 2017a; Autor et al. 2003, 2008, and 2013.
41. Acemoglu and Restrepo 2017b.
42. Stiglitz 2014: 1.
43. Lin and Monga 2019: chapter 1.
44. See Monga (2013a), Lin (2011), and the annex above on a simple theoretical framework for labor arbitrage.
45. Stiglitz 2014; Timmer 2019.
46. Pardey and Alston 2019.
47. As noted by Green (2013) Nigeria for instance once provided 18 percent of the global production of cocoa, second in the world in the 1960s, that figure is now down to 8 percent. And while the country produces 65 percent of tomatoes in west Africa, it is now the largest importer of tomato paste.
48. Adesina 2017; <https://www.afdb.org/en/news-and-events/remarks-delivered-by-dr-akinwumi-adesina-world-food-prize-laureate-2017-and-president-of-the-african-development-bank-at-the-special-event-on-transforming-the-african-savannah-initiative-world-food-prize-october-18-2017-des-moines-iowa-usa-17449/>.
49. African Development Bank statistics.
50. Čihák 2012.
51. Green 2013.
52. See AFDB forthcoming.
53. Acemoglu and Restrepo 2019; <https://www.project-syndicate.org/commentary/ai-automation-labor-productivity-by-daron-acemoglu-and-pascual-restrepo-2019-03>.
54. Calderon and Servén 2011.
55. Many poor countries obtained debt reduction through the HIPC (Heavily Indebted Poor Countries), Enhanced HIPC, and the Multilateral Debt Relief Initiatives in the 1990s and 2000s. These various debt relief operations cost over \$100 billion. To qualify for partial debt cancellation, countries had to fulfill four requirements: produce a periodic “Poverty Reduction Strategy Paper” using templates provided by foreign donors; stick to macroeconomic stabilization plans mainly designed by the IMF; reject nonconcessional borrowing; and devote all their savings in debt payments into social programs. Not surprisingly, most of these countries were able to improve their social and poverty indicators but did not manage to invest in productive industries and sectors. As a result, they failed to reap the macroeconomic benefits (that is, higher growth rates, increased fiscal revenue and reserves) that could have been expected. Some of them are now being lured into contracting new debt from Paris- and non-Paris Club lenders, often on nonconcessional terms, which may lead yet again to unsustainable indebtedness levels.
56. In the case of the African Investment Bank created by the African Union in 2009 but never made functional, Monga (2012) estimates that an initial capital endowment of at least \$50 billion would be required to make it credible. The bank would then be able to raise a sizeable multiple of that for its operations. The countries of the European Union initially contributed \$50 billion in capital to the European Investment Bank, which borrows an additional \$420 billion and is therefore able to finance investments worth more than \$470 billion (Skidelsky and Martin 2011). Although the European Union has an economy almost ten times the size of the economies of Africa (\$16 trillion in 2010), the same principle would work for the AIB if the institution is credibly set up and managed.
57. Devarajan and others 2003.
58. Devarajan and others 2003: 547.
59. Besides the European Investment Bank, the list of well-known cases includes the German Kreditanstalt für Wiederaufbau (KfW), the Korea Development Bank, and the Development Bank of Japan.
60. African Development Bank 2019b.
61. As a first step, some development institutions have proposed a basic charter of rights and obligations for small traders in Africa that could be clearly posted at all border posts. The concept of the charter was endorsed by the African Union trade ministers in November 2011.
62. See <http://www.doingbusiness.org/about-us>.
63. A special economic zone is a geographical area that offers investors more liberal economic laws than the country’s typical laws. It is an economic development tool to promote rapid economic growth by using fiscal



and business incentives to attract investment, technology, and knowledge. When successful, SEZs can act as a magnet for investment in desirable activities in specially designated areas by providing quality infrastructure, attractive fiscal packages, business support services, cluster formation, and minimal regulation.

64. These lessons from economic history and analysis go back to Marshall's *Principles of Economics* (1880), especially chapter 10 on "the concentration of specialized industries in particular localities." He provided the examples of the Sheffield cutlery industry and the Staffordshire pottery industry.
65. Mauritius is one of the first countries in modern times to successfully adopt export processing zones with labor law flexibility that allows firms to dismiss workers and set wage rates. See Rhee and Belot (1990).
66. FIAS 2008: 12.
67. The African Growth and Opportunity Act (AGOA) is a part of U.S. legislation that liberalizes market access to the United States for 40 eligible Sub-Saharan African countries. The Act originally covered the 8-year period from October 2000 to September 2008, but amendments further extend AGOA to 2015. AGOA builds on existing U.S. trade programs by expanding the (duty-free) benefits previously available only under the Generalized System of Preferences (GSP). Duty-free access to the U.S. market under the combined AGOA/GSP program now stands at approximately [7,000] product tariff lines, including the roughly 1,800 product tariff lines that were added to the GSP by the AGOA legislation. Notably, these include items such as apparel and footwear, wine, certain motor vehicle components, a variety of agricultural products, chemicals, steel, and so on.
68. Monga 2013b. As of 2018, there were approximately 5,000 SEZs around the world, of which only about half of them actually operational.
69. African Development Bank 2018b.
70. Devarajan and others 2011.
71. Strom 1989; Heath and Mobarak 2015.
72. "For example, in the Dominican Republic's Juventud y Empleo project, comprehensive job training has bumped up young people's salaries by as much as 10 percent. The returns to the investment in the young beneficiaries are expected to exceed the program costs within two years of graduation. These returns

to investment are observed across the Latin America region." (Lin and Cunningham 2010)

73. UIS/UNESCO.
74. Devarajan et al. 2011.
75. Helms 2019.
76. Dustmann and Schoenberg 2008.
77. Helms (2019) reports about high school educators in North Carolina passing on the message to its students that "it's OK not to go to college — but not OK to leave high school without a plan." The number of students in the Charlotte-Mecklenburg district "earning industry certifications, a sign that they've taken courses to prepare for a skilled trade, has quadrupled from 2016 to 2018. In the district has also launched a website, <https://discovercte.com>, to encourage students and families to check out options and start exploring them as early as middle school. "
78. Teal 2016.
79. See Monga (2013) and Dornbusch et al. (1977) for the general formulation.
80. This is true in particular for the 14 African countries whose national currencies have been pegged at a fixed exchange rate to the French Franc and the Euro, with mostly devastating consequences on competitiveness. See Monga (1997b) and Devarajan and de Melo (1991).

REFERENCES

Acemoglu, D., and P. Retrepo. 2019. "The Revolution Need not be Automated." Project Syndicate, March 29.

———. 2018. *Demographics and Automation*, MIT Department of Economics Working Paper No. 18-05, Cambridge, MA.

———. 2017a. *The Race Between Machine and Man: Implications of Technology for Growth, Factor Shares and Employment*, NBER Working Paper No. 22252, Cambridge, MA.

———. 2017b. *Robots and Jobs: Evidence from US Labor Markets*, NBER Working Paper No. 23285, Cambridge, MA.

Adesina, A.A. 2017. Remarks Delivered at the Special Event on "Transforming the African Savannah Initiative." World Food Prize, October 18, Des Moines, Iowa.

- African Development Bank. 2019a. Debt Dynamics and Sustainability in Africa, Unpublished Report, Abidjan, African Development Bank.
- . 2019b. African Economic Outlook 2019, Abidjan, African Development Bank.
- . 2018a. African Economic Outlook 2018, Abidjan, African Development Bank.
- . 2018b. Staple Crops Processing Zones A Flagship Program of the Feed Africa Strategy, Abidjan, African Development Bank.
- . 2012. Facilitation Green Growth in Africa: Perspectives from the African Development Bank, Discussion Paper, Tunis.
- Assaad, R., and C. Kraft. 2015. “The Economics of Marriage in North Africa: A Unifying Theoretical Framework.” In: C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Africa and Economics*, volume 1: Context and Concepts, New York, Oxford University Press, pp. 72–85.
- Autor, D. H., and D. Dorn. 2013. “The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market.” *American Economic Review*, 103 (5): pp. 1553–97.
- Autor, D., L. F. Katz, and M. S. Kearney. 2008. “Trends in U.S. Wage Inequality: Revising the Revisionists.” *Review of Economics and Statistics*, 90(2): 300–323.
- Autor, D., F. Levy, and R. Murnane. 2003. “The Skill Content of Recent Technological Change: An Empirical Exploration.” *The Quarterly Journal of Economics*, 118(4): 1279–1333.
- Basu, A., and K. Basu. 2015. “The Prospects for an Imminent Demographic Dividend in Africa: The Case for Cautious Optimism.” In: C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Africa and Economics*, volume 2: Policies and Practices, New York, Oxford University Press, pp. 849–872.
- Bennell, P. 1996. “Rates of return to education: Does the conventional pattern prevail in sub-Saharan Africa?” *World Development* 24(1): 183–199.
- Berg, A., E. Buffie, C. Papageorgiou, R. Xu, and F. Zanna. 2018. Searching for Wage Growth: Policy Responses to the Robot Revolution, Presentation at the IMF/INET Conference on the Macroeconomics of AI, Washington, DC., April.
- Blanchard, O. 2019. “Public Debt and Low Interest Rates.” *The American Economic Review*, forthcoming.
- Calderon, C., and L. Serven. 2011. “Infrastructure in Latin America.” In José Antonio Ocampo and Jaime Ros (eds.), *Handbook of Latin American Economies*. Oxford: Oxford University Press.
- Čihák, A., A. Demirgüç-Kunt, E. Feyen, and R. Levine. 2012. Benchmarking Financial Systems around the World, Policy Research Working Paper 6175, Washington, DC, World Bank.
- Davies, G. 2013. ‘Why world trade growth has lost its mojo.’ *Financial Times*, 29 September.
- Davis, M. 2018. “Unlocking the Potential of Young Working Women in the Middle East and North Africa.” *Carnegie Ethics Online Monthly Column*, October 17.
- Deininger, K, H. Selod, and A. Burns. 2011. *The Land Governance Assessment Framework: Identifying and Monitoring Good Practice in the Land Sector*, Washington, DC., World Bank.
- Devarajan, S., and J. de Melo. 1991. “Membership in the CFA Franc Zone: Odyssean Journey or Trojan Horse?” in A. Chibber and S. Fischer (eds.), *Economic Reform in Sub-Saharan Africa*, Washington, DC., World Bank, pp. 25–33.
- Devarajan, S., W. Easterly, and H. Pack. 2003. “Low Investment is not the Constraint on African Development.” *Economic Development and Cultural Change*, 51(3): 547–571.
- Devarajan, S., C. Monga, and T. Zongo. (2011). “Making higher education finance work for Africa.” *Journal of African Economies*, 20(3): 133–154.
- Dornbusch, R., S. Fischer, and P. A. Samuelson. 1977. “Comparative Advantage, Trade and Payments in a Ricardian Model with a Continuum of Goods.” *American Economic Review* 65(5): 823–839.
- Duarte, M., and D. Restuccia. 2010. “The role of the structural transformation in aggregate productivity.” *The Quarterly Journal of Economics*, 125(1): 129–173.


- Dustmann, C., and U. Schoenberg. 2008. "Why Does the German Apprenticeship System Work?" In: K. U. Mayer and H. Solga (eds.), *Skill Formation: Interdisciplinary and Cross-National Perspectives*, Cambridge, Cambridge University Press.
- Easterly, W., and Y. Nyarko, Y. (2008). *Is the Brain Drain Good for Africa?* Working Paper No. 19. Washington, DC: Brookings Global Economy and Development.
- Edwards, L., and S. S. Golub. 2004. "South Africa's International Cost Competitiveness and Exports in Manufacturing." *World Development* 32(8): 1323–1339.
- Eifert, B., A. Gelb, and V. Ramachandran. 2008. "The Cost of Doing Business in Africa: Evidence from Enterprise Survey Data." *World Development* 36(9): 1531–1546.
- Elbadawi, I., and S. Makdisi. 2017. *Democratic Transitions in the Arab World*, Cambridge, UK: Cambridge University Press.
- Enache, M., E. Ghani, and S. D. O'Connell. 2016. 'Structural Transformation in Africa: A Historical View'. Policy Research Working Paper No. 7743. World Bank, Washington, DC.
- FIAS. 2008. *Special Economic zones: Performance, Lessons Learned, and Implications for zone Development*. Washington, DC: IFC-World Bank.
- Fox, L., A. H. Thomas, and C. Haines. 2017. *Structural Transformation in Employment and Productivity: What Can Africa Hope For?* IMF Departmental Papers/Policy Papers 17/02, Washington, DC., IMF.
- Fox, L., and M. S. Gaal, 2008. *Working out of Poverty: Job Creation and the Quality of Growth in Africa*. The World Bank, Washington, DC.
- Frey, C. B., and M. A. Osborne. 2013. *The Future of Employment: How Susceptible Are Jobs to Computerisation?* Oxford, England: Oxford Martin School, University of Oxford.
- Gelb, A., C. Meyer, and V. Ramachandran. 2013. "Does Poor Mean Cheap: A Comparative Look at Africa's Industrial Labor Costs." Center for Global Development Working Paper, Washington, May.
- Ghani, E., and S. D. O'Connell. 2014. 'Can Service Be a Growth Escalator in Low Income Countries?' Policy Research Working Paper No. 6971. World Bank, Washington, DC.
- Glewwe, P. 1996. "The relevance of standard estimates of rates of return to schooling for education policy: A critical assessment." *Journal of Development Economics*, 51(2): 267–290.
- Green, A. R. 2013. "Interview: Akinwumi Adesina, Minister of Agriculture, Nigeria." *Thisisafricaonline.com*, July 30.
- Gollin, D., D. Lagakos, and M. E. Waugh. 2014. "The Agricultural Productivity Gap." *The Quarterly Journal of Economics*, 129(2): 939–993.
- Golub, S., and F. Hayat. 2015. "Employment, Unemployment, and Underemployment in Africa." In C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Africa and Economics, volume 1: Context and Concepts*. New York: Oxford University Press, pp. 136–153.
- Haraguchi, N. 2014. *Patterns of Industrialization and Effects of Country-specific Conditions*. Presentation at the Meeting of the IPD/JICA Task Force on Industrial Policy and Transformation. Dead Sea, Jordan, June 5–6.
- Haraguchi, N., C. F. Chin Cheng, and E. Smeets. 2017. "The Importance of Manufacturing in Economic Development: Has this Changed?" *World Development*, 93, May, pp. 293–315.
- Heath, R., and A. M. Mobarak. 2015. "Manufacturing Growth and the Lives of Bangladeshi Women." *Journal of Development Economics*, 115(July): 1–15.
- Helms, A. D. 2019. "Not going to college? No problem. No plan for alternatives? NC schools want to talk." *The Charlotte Observer*, February 27.
- Herrendorf, B., R. Rogerson, and A. Valentinyi. 2014. "Two Perspectives on Preferences and Structural Transformation." *American Economic Review*, 103(7): 2752–2789.
- ICFGE0 (The International Commission on Financing Global Education Opportunity). 2016. *The Learning Generation: Investing in Education for a Changing World*, http://report.educationcommission.org/wp-content/uploads/2016/09/Learning_Generation_Full_Report.pdf.

- IMF. 2019. *Fiscal Monitor: Curbing Corruption*, Washington, DC.
- Hjort, J. and J. Poulsen. 2019. "The Arrival of Fast Internet and Employment in Africa." *American Economic Review*, 109(3): 1032–1079.
- ILO. 2018. *World Employment and Social Outlook: Trends 2018*, Geneva.
- . 2017. *Global employment trends for Youth 2017: Paths to a Better Working Future*. Geneva.
- Kim, J.-Y. 2017. Opening Remarks by World Bank Group President Jim Yong Kim WBG/IMF 2017 Spring Meetings Opening Press Conference, Washington, DC., April 17, <http://www.worldbank.org/en/news/speech/2017/04/20/opening-remarks-by-world-bank-group-president-jim-yong-kim-wbg-imf-2017-spring-meetings-opening-press-conference>.
- Lin, J. Y. 2011. *From Flying Geese to Leading Dragons: New Opportunities and Strategies for Structural Transformation in Developing Countries*, WIDER Annual Lecture 15, Helsinki: UNU-WIDER.
- Lin, J. Y., and W. Cunningham. 2010. "Seizing Opportunity Now Will Make the World Fairer and Safer." *Financial Times*, January 28.
- Lin, J. Y., and C. Monga. 2017. *Beating the Odds: Jump-Starting Developing Countries*, Princeton, NJ: Princeton University Press.
- Lin, J. Y., and C. Monga. 2011. "Growth Identification and Facilitation: The Role of the State in the Dynamics of Structural Change." *Development Policy Review*, 29 (3), 264–90.
- Lin, J. Y., and C. Monga. 2017. *Beating the Odds: Jump-Starting Developing Countries*, Princeton, N.J., Princeton University Press.
- Marshall, A. 1890. *Principles of Economics*. London: Macmillan.
- McKinsey Global Institute. 2015. *The power of parity: How advancing women's equality can add \$12 trillion to global growth*.
- McMillan, M., and K. Harttgen. 2015. "Africa's Quiet Revolution." In C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Africa and Economics, volume 2: Policies and Practices*. New York: Oxford University Press, pp. 39–61.
- McMillan, M., and D. Rodrik. 2012. "Globalization, Structural Change and Productivity Growth." Discussion Paper, International Food Policy Research Institute, Washington, February.
- Monga, C. 2019. "Truth is the Safest Lie: A Reassessment of Development Economics." In C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Structural Transformation*. New York: Oxford University Press, pp. 659–671.
- . 2013a. "Winning the Jackpot: Jobs Dividends in a Multipolar World." in Joseph E. Stiglitz, Justin Yifu Lin, and Ebrahim Patel (eds.), *The Industrial Policy Revolution II—Africa in the 21st Century*. New York: Palgrave MacMillan, pp. 135–171.
- . 2013b. "Theories of Agglomeration: Critical Analysis from a Policy Perspective." In: J.E. Stiglitz and J.Y. Lin (eds.), *The Industrial Policy Revolution I: The Role of Government Beyond Ideology*. New York: Palgrave Macmillan, pp. 209–224.
- . 2012. "Shifting Gears: Igniting Structural Transformation in Africa." *Journal of African Economies* 21 (supplement 2): ii19–ii54.
- . 2006. "Commodities, Mercedes-Benz, and Adjustment: An Episode in West African History." In E. K. Akyeampong (ed.), *Themes in West Africa's History*. Oxford: James Currey, pp. 227–264.
- . 1997a. "Eight Problems with African Politics." *Journal of Democracy*, 8(3): 156–170.
- . 1997b. "A Currency Reform Index for Western and Central Africa." *The World Economy*, 20(1): 103–126.
- . 1996. *The Anthropology of Anger: Civil Society and Democracy*, Boulder, CO, Lynne Rienner Publishers.
- Nabli, M. K. 2019. *J'y crois toujours: Au-delà de la débâcle... une Tunisie démocratique et prospère*. Tunis: Sud Editions.
- Oqubay, A. 2018. *Industrial Policy and Late Industrialisation in Ethiopia*, Working Paper Series No. 303, African Development Bank, Abidjan, Côte d'Ivoire.
- Pardey, P. G., and J. M. Alston. 2019. "Transforming Traditional Agriculture Redux." In C. Monga and J.Y. Lin

- (eds.), *The Oxford Handbook of Structural Transformation*. New York: Oxford University Press, pp. 363–380.
- Powell, A. 2019. Apprenticeships and skills policy in England, Briefing Paper Number CBP 03052, 7 January, London, www.parliament.uk/commons-library.
- Rhee, Y. W., and T. Belot. 1990. *Export Catalysts in Low-Income Countries: A Review of Eleven Success Stories*. World Bank Discussion Papers No. 72. Washington, DC: World Bank.
- Rodrik, D. 2016. “Premature Deindustrialization.” *Journal of Economic Growth*, 21(1): 1–33.
- Roosevelt, F. D. 1933. “Inaugural Address, March 4.” In S. Rosenman (ed.), *The Public Papers of Franklin D. Roosevelt, Volume Two: The Year of Crisis, 1933*. New York: Random House, 1938, pp. 11–16.
- Sachs, J. D. 2018. R&D, Structural Transformation, and the Distribution of Income, Presentation at the IMF/INET Conference on the Macroeconomics of AI, Washington, DC, April.
- Sachs, J. D. 2015. “Africa’s Demographic Transition and Economic Prospects.” In C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Africa and Economics, volume 2: Policies and Practices*. New York: Oxford University Press, pp. 873–894.
- Schwab, K. 2016. “The Fourth Industrial Revolution: what it means, how to respond.” World Economic Forum, January 14. <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>.
- Schwieters, N., and B. Moritz. 2017. “10 Principles for Leading the Next Industrial Revolution.” *strategy+business*, Autumn 2017/Issue 88.
- Skidelsky, R., and F. Martin. 2011. “For a National Investment Bank.” *The New York Review of Books*, LVIII(7): 26–29.
- Stiglitz, J. 2018. The Macroeconomics of AI, Presentation at the IMF/INET Conference on the Macroeconomics of AI, Washington, DC., April.
- . 2014. *Unemployment and Innovation*, NBER Working Paper No. 20670, Cambridge, MA.
- Strom, S. H. 1989. “‘Light Manufacturing’: The Feminization of American Office Work, 1900–1930.” *Industrial and Labor Relations Review* 43(1) (October): 53–71.
- Summers, L. 2017. The Case for a Proper Program of Infrastructure Spending, <http://larrysummers.com/2017/01/17/the-case-for-a-proper-program-of-infrastructure-spending/>.
- . 2014. “Invest in infrastructure that pays for itself.” *The Washington Post*, October 7.
- Teal, F. 2016. Are apprenticeships beneficial in sub-Saharan Africa? IZA World of Labor 2016: 268.
- Thomas, M. R., and M. M. Giugale 2015. “African Debt and Debt Relief.” In C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Africa and Economics, volume 2: Policies and Practices*. New York: Oxford University Press, pp. 186–203.
- Timmer, C. P. 2019. “Changing Income Inequality during Structural Transformation: The Role of Agricultural Prices.” In C. Monga and J.Y. Lin (eds.), *The Oxford Handbook of Structural Transformation*. New York: Oxford University Press, pp. 127–150.
- UNCTAD (United Nations Conference on Trade and Development). 2012. *The Least Developed Countries Report 2012: Harnessing Remittances and Diaspora Knowledge to Build Productive Capacities*. Geneva, Switzerland.
- UNIDO (United Nations Industrial Development Organization). 2013. *Industrial Development Report 2013*. Vienna.
- . 2016. *Industrialization in Africa and Least Developed Countries: Boosting growth, creating jobs, promoting inclusiveness and sustainability—A Report to the G20 Development Working Group by UNIDO*. Vienna.
- World Bank. 2016. *World Development Report 2016: Digital Dividends*, Washington, DC.
- . 2014. *Youth Employment in Sub-Saharan Africa*, Washington, DC.

AN INDUSTRIAL POLICY FOR GOOD JOBS

Dani Rodrik, Harvard University
and Charles Sabel, Columbia University

 @rodrikdani

Productive dualism is driving many contemporary ills in developed and developing countries alike: rising inequality and exclusion, loss of trust in governing elites, and growing electoral support for authoritarian populists. But much of the policy discussion today focuses on solutions that miss the true source of the problem.

In developed and developing countries alike, a combination of technological and economic forces has created a segment of advanced production, concentrated in metropolitan areas, that now co-exists with a mass of relatively less productive activities and communities. This productive dualism lies behind many contemporary ills: rising inequality and exclusion, loss of trust in governing elites, and growing electoral support for authoritarian populists. But much of the policy discussion today focuses on solutions that miss the true source of the problem.

For example, redistribution through taxes and fiscal transfers accepts the productive structure as given, and merely ameliorates the results through handouts. Likewise, investments in education, universal basic income, and social wealth funds seek to strengthen the workforce's endowments, without ensuring that better endowments will be put to productive use. Meanwhile, job guarantees and Keynesian demand management offer little in the way of improving the mix of jobs.

To be sure, we need many of these policies. But they will work best—and in the long run perhaps only—with a new set of “productivist” measures that intervene

directly in the real economy, targeting the expansion of productive employment.

The strategy would comprise three mutually reinforcing components: an increase in the skill level and productivity of existing jobs, by providing extension services to improve management or cooperative programs to advance technology; an increase in the number of good jobs by supporting the expansion of existing local firms or attracting investment by outsiders; and active labor-market policies or workforce-development programs to help workers, especially from at-risk groups, master the skills required to obtain good jobs.


None of these three components is novel, and elements of each can be found in actual government programs. But existing policies are typically rooted in regulatory frameworks that work poorly under conditions of high uncertainty. What is a good job? How many can be reasonably created? How do technological and other firm-level choices influence job creation? Which complementary policy levers are available? How can that set of instruments be expanded?

These are necessarily local, contextual questions. They can be answered, and

periodically revised, only through an iterative process of strategic interaction between public agencies and private firms. A common theme that emerges from studies of so-called place-based policies, such as regionally targeted employment subsidies and infrastructure investment, is the heavily contingent nature of success. Few policies work off the shelf and reliably across diverse settings.

Competitions among states and localities to attract large employers with tax and other subsidies work especially badly. Recent high-profile deals for Foxconn and Amazon, in Wisconsin and New York respectively, have blown up. In addition to being lopsided, they were predicated on a stable environment, reflected in fixed and detailed contractual terms. When Foxconn faced changes in demand and technology, and Amazon confronted unexpected political fallout, there was insufficient room for revision or renegotiation.

Governance regimes must fully recognize the provisional, iterative nature of any effective policy framework. Fortunately, the principles on which such regimes can be constructed do not need to be invented from scratch. They can be borrowed from innovative governance



arrangements that firms, regulators, and other public agencies have already developed in other spheres.

In a recent paper, we provide detailed illustrations from two domains: the nurturing of technologies by the Defense Advanced Research Projects Agency (DARPA) and its offshoot, the Advanced Research Projects Agency-Energy (ARPA-E) in the US, and the environmental regulation of dairy farming in Ireland.

Under extreme uncertainty, none of the parties—neither regulators nor firms—have reliable information about the possibilities and costs of adjustment in the medium term, and only vague conjectures regarding future possibilities. The response—in innovation promotion, environmental regulation, food safety, and civil aviation among other areas—is the creation of an information-exchange regime that ties ongoing specification of goals to continuing exploration of new solutions.

In the European Union, for example, the regulator establishes “good water” as an ambitious, open-ended outcome. The regulated entities and affected parties—firms and farms, member states, local governments, civil-society actors—are obligated to make plans to achieve the goals and to report results regularly. Penalties are imposed for failure to

report honestly, or for persistent failure to achieve feasible results (as demonstrated by others in a similar position). These methods are not self-policing. Like all institutions, they can be corrupted or degraded. But with proper public oversight, they work when conventional approaches fail.

Apart from a few notably successful community college training programs, such governance arrangements have not been deployed in pursuit of good jobs. But they can be adapted to that end. The concept of a “good job,” like clean water, is imprecise and needs to be operationalized in a way that is both evolving and context-dependent. A good-jobs strategy could be introduced in four steps.

First, by legislation or other means, the government commits to address the problem of bad jobs, creates an inter-agency body to review and prompt improvement of regulatory responses, and provides funds and authority for voluntary programs. Second, regulators currently overseeing areas directly affecting job abundance and quality—vocational training, agricultural and manufacturing extension, standard setting, and the like—introduce governance mechanisms that not only induce innovation, but also anticipate the need for support services to help vulnerable actors comply with increasingly demanding

requirements. The requirements could take different forms, including specific employment quantity targets and/or standards.

Third, where current regulatory authority doesn’t reach, the government creates volunteer, public-private programs to advance the frontiers of technology and organization, or—perhaps more important—provides support services and possibly subsidies to help low-productivity/low-skill firms move to the advanced sector. Finally, conditional on the success of voluntary arrangements, the scope of these practices would gradually be made obligatory for nonparticipating firms, starting with mandatory submission of credible plans for improving the quality and quantity of jobs.

An attractive feature of the good-jobs strategy we propose is that the same institutions of interactive governance that enable the parties to specify and solve the problems they face under uncertainty also enable them to develop the trust and mutual reliance they need to deepen and broaden their efforts. The broad coalition needed for the approach to succeed need not already exist; it can and will likely be the result of pursuing the strategy. Trust and new alliances are as much—or more—the outcome of joint problem-solving as its preconditions.

CAN AGRICULTURE CREATE JOB OPPORTUNITIES FOR YOUTH?

Luc Christiaensen

World Bank

Technology and the internet are probably the first things that come to mind when you think about the future of work for young people, not agriculture or farming. This makes historical sense, as agriculture sheds labor when countries develop. And the traditional ways of producing food do not look particularly sexy. Yet, technology and the internet are also opening up opportunities for agriculture, and urbanization and changing diets are calling for new ways to process, market and consume foods. So, can agriculture provide job opportunities for youth? Yes.

The share of farming jobs is undoubtedly shrinking. This is normal. As countries urbanize and incomes rise, food expenditures decline as a share of total spending. To help produce these other goods and services, farmers take up jobs off the farm. Yet the process can be sustained only if labor productivity in farming increases, through innovation in production as well as better access to markets to sell the surplus. ICT is helping with both.

Take automation. The lack of mechanization in Africa has long puzzled many observers, who, given the region's current population density and market access, had long expected to see much more mechanization on the continent.

Yet, there are now signs that it may be starting to happen, through machinery services, facilitated by ICT.

The current leading example is “Hello Tractor,” an innovative platform in Nigeria to co-share tractors using SMS, GPS, and smart sensors. This “Uber for tractors” has enabled access to smart tractors at the doorstep of small farmers, significantly increasing productivity through mechanization. Even so, many challenges remain for mechanization across the region, including access to finance, in the timely availability of support services and in attaining scale. Temptations to subsidize mechanization should be resisted, ensuring that the process remains compatible with market forces, as revealed through factor price ratios (labor over capital and labor over land).


The potential benefits from ICT in increasing agricultural labor productivity are not limited to mechanization. ICT also helps improve agronomic practices by facilitating extension, and importantly it increases farmers' access to markets (old and new), and can leverage their bargaining positions, enabling them to get a better price for their produce. Farmbook in Africa and MFarming in Tanzania are just some of the more recent initiatives using ICT tools to do so. Better market access and higher prices

will in turn foster the adoption of productivity-enhancing technologies to increase supplies. This opens up important perspectives for rural youth to raise their income in agriculture.

Some other opportunities are emerging in urban areas. Between 1,000 and 15,000 farming jobs have been created in urban centers like Accra, Bamako, and Kumasi. Even megacities such as Shanghai maintain their urban farming as an important part of the economic system.

The technologies are at times often also quite advanced, such as those applied by Fresh Direct Nigeria—recent winner of the WEF African Technology Entrepreneur of the Year award—who pioneered peri-urban fresh food production through stackable container farms. By using hydroponics, its organic urban farms use less water and land than conventional farming while producing 15 times higher yields, and enabling urban dwellers access to high-quality produce.

But most new and good jobs are to be generated down and up agricultural stream. With the demand for aggregation, storage, processing, logistics, food preparation, restaurants, and other related services becoming more important, many employment opportunities will emerge off the farm, in the larger



agri-food systems. Just like Hello Tractor generates high-quality job opportunities for tractor owners, drivers, and other providers of financial services, these downstream activities will also open significant job opportunities. In Southern and Eastern Africa, they are predicted to absorb about a quarter of the labor released by on-farm agriculture over the coming decade.

To better prepare youth and women to take up these jobs, the Africa Agribusiness Incubators Network is establishing at least 108 incubators in 54 African

countries in the next five years focusing on youth and women. The plan is to expose 60,000 students to the “learn as you earn model” and mentor them to start new businesses. This aims to create at least 600,000 jobs and 100,000 startups and SMEs.

While the majority of youth expresses to see its future outside agriculture, many good job opportunities on and off the farm remain in agriculture. The challenge is to make the agricultural sector and its upstream and downstream activities competitive through innovation,

public investment in supportive rural public goods and services, and secondary town development to make them sufficiently attractive to young and older farmers alike. This remains a largely unfinished agenda, one that is equally important to reach the twin goals of eradicating extreme poverty and boosting shared prosperity.

Source

World Bank. 2017. *Jobs and Development*. <https://www.worldbank.org/en/topic/jobsanddevelopment>.

POLICIES TO FOSTER AFRICA'S DIGITAL TRANSFORMATION AND CREATE ICT JOBS

Adapted from the “Africa Innovation Policy Manifesto,” a document prepared by a large group of global, national, and regional hub networks including Afrilabs (Anna Ekeledo), Global Innovation Gathering (Vicky Wenzelmann), Impact Hub Network (Emily Sheldon), JokkoLabs (Karim Sy), Meltwater Entrepreneurial School of Technology (Atawodi-Edun Neku), rLabs (René Parker), and Womanity (Asmaa Guedira).

In May 2018, social innovators, entrepreneurs, and representatives of innovation spaces and startups from across Africa met in Kigali, Rwanda, to articulate and share their views and recommendations for policies to accelerate digital transformation and contribute to more equitable, inclusive, and sustainable development. The group represented global, regional, and national hub networks; community innovation hubs from 32 African countries, and 33 other supporting organizations and affiliates. Here are their key recommendations:

Education and research and development

Governments should urgently adopt an approach to stimulating research and development (R&D) and innovation education across the continent by investing in R&D and boosting indigenous R&D. With a broad coalition of partners, they should create education systems that emphasize e-learning tools and do-it-yourself hands-on learning that reward experimentation, failure, and critical thinking, and that teach digital and financial literacy and software skills. The systems should affirm diversity and inclusion of marginalized groups and highlight science, technology, engineering, arts, and mathematics education.

Public multidisciplinary spaces

Public spaces should be developed for citizens to gather, discuss socially and commercially relevant issues, and co-design solutions. Governments can partner with trusted local grassroots and community-based groups, hubs, and labs on these spaces to foster bottom-up innovation, mutual learning, exchange, and serendipity.

Digital infrastructure

To reduce the cost of internet access and increase the amount of African-hosted content, governments must encourage shared national and regional ownership of fiber infrastructure. Tax waivers for importing and producing information and communications technology equipment will support entrepreneurs, and tax waivers for digital infrastructure investments will reduce the retail costs paid by consumers.

Business registration

Business registration must be available online, and the costs—financial and transactional—must be lowered. New business owners must also be provided a comprehensive list of their regulatory

obligations and receive legal support during registration. Closing businesses and declaring bankruptcy must also be eased and decriminalized.

Finance for innovation and entrepreneurship

Entrepreneurs should receive financial training and mentoring through institutions such as community innovation hubs and should receive clear information on grants, loans, venture capital, private equity funds, and government innovation and small and medium enterprise funds. Corporations, nongovernmental organizations, multilateral institutions, financial institutions, and angel investors can invest in early-stage enterprise acceleration, offer lower interest rates for entrepreneurs, and unlock funding for pre-seed and seed stage startups.

Local and pan-African markets

Improving market access for African businesses must be addressed through collaboration among African governments. The mobility of people, goods, and services should be eased through improved visa regimes and continent-wide infrastructure.



Intellectual property rights

The African Union should adopt a joint IP policy to simplify registration, increase transparency, and make it easier for startups to register intellectual property ownership.

Taxation

A simplified digital tax registration and filing system under a government one-stop shop will support innovation and business growth better than the current regime.



PART 1

AFRICAN LABOR MARKETS: FEATURES AND DYNAMICS



CONFRONTING AFRICA'S EMPLOYMENT PROBLEM

Gary S. Fields

Cornell University, IZA, and WIDER

This study examines African labor markets through published reviews covering hundreds of studies on employment and employment interventions. Though Africa is said to have an unemployment problem, low employment quality is the real problem (with unemployment just a small component), evident in the small number of well-paying jobs, small number and uncertainty of work hours, high levels of casual employment, and inadequate labor regulations and workplace protections. Most Africans earn so little that they and their families are poor. Around 90 percent of job growth in Africa is in the informal sector.

Four structural features characterize African labor markets: informality, agricultural dominance, low-productivity/low-quality employment, and underemployment. Only a small share of workers are wage and salary employees; most are self-employed in family farming or household enterprises. Many people enter the informal sector as a strategy of last resort. Informality rates in Africa are highest in countries with the lowest rate of unemployment.

Few studies of policy interventions for increasing employment opportunities, boosting labor market earnings, and supporting the self-employed have found statistically significant effects, and even they were too context-specific to permit generalization. Since current policies appear to be of limited effectiveness, more market-level analysis is needed.

Programs for the self-employed are particularly important, especially for agricultural employment, youth unemployment, and micro- and

small enterprises. Small-scale farmers are helped by closer ties to value chains and information on credit, agricultural technologies, and risk reduction instruments. Youth get some help from entrepreneurship promotion and grants or loans to alleviate startup capital constraints. Micro- and small enterprises need business training and other human capital improvements and a more conducive regulatory environment. Measures to benefit the most vulnerable self-employed—such as the poor, women, and migrants—should be targeted to the specific needs of each group.

INTRODUCTION

This study examines two principal questions:

- What are the main features of African labor markets?
- In view of these features, what are promising policy interventions that could increase

employment opportunities and labor market earnings, including interventions that have been undertaken (successfully or unsuccessfully) in other regions of the world to support the self-employed?

Each question is examined in turn. But first, why the focus on labor markets and labor earnings (see box 1 for key definitions)? While it is a slight exaggeration to say that labor is the only asset of the poor, because some poor people do have other assets, these other assets typically generate little or no income compared with labor income. National accounts data consistently show that the combined earnings of employees and the self-employed are larger than are all other sources

of income combined. In addition, decomposition studies show that the inequality of labor earnings accounts for a larger share of the inequality of total incomes than inequality in all other sources of income combined. As a consequence, “having access to stable labor market income is a key determinant for households to achieve economic stability.”¹ Finally, labor markets and labor earnings are also important for non-economic reasons, as people are defined, in part, by the work they do. As the World Bank’s *World Development Report 2013: Jobs* proclaims: “Jobs are what we earn. Jobs are what we do. Jobs are who we are.”²

And why focus on Africa? Start with the obvious fact that most Africans have unacceptably low

BOX 1

Basic labor market concepts: Labor markets, employment, unemployment, and earnings

Most countries in Africa and throughout the world follow international definitions as prescribed by the International Labour Organization (ILO). *Labor markets* are defined as the places where labor services are bought and sold. People who work in wage employment (also termed “paid employment,” “salaried employment,” and “wage and salaried employment”) sell their labor services to an employer and are paid a labor income in exchange. People who are self-employed sell their labor services to themselves or to household enterprises and may employ one or a few workers in their production activities.

In this study, *wage employees* and the *self-employed* are both considered to be employed and to be participating in the labor market regardless of their sector of employment. (Some studies limit the labor market to non-agricultural workers.) People who are not employed but are looking for work are considered *unemployed*, while people who are not employed and are not seeking employment (for example, because they are too young, too old, or too sick or because they have other things they would rather do, such as work as homemakers) are not considered unemployed.

Taken together, the employed and the unemployed constitute the *labor force* (or the “economically active population”). The *unemployment rate* is defined as the ratio of the number of unemployed people to the number of employed people. The *labor force participation rate* is defined as the ratio of the labor force to the population—sometimes the entire population and other times the working age population.

Employed individuals and their households can use the income from participating in the labor market (*labor earnings* or simply *earnings*) to buy at least some of the things they need or want. Other types of income are social incomes—which individuals and households may receive by virtue of being citizens or residents of a country (such as education and clean running water)—and incomes from capital or land.

standards of living. A majority of working Africans earn so little that they and their families are poor. Some 43 percent of Africans live on less than \$1.90 per person per day (in 2011 purchasing power parity dollars), the World Bank definition of extreme poverty.³ Relative to other parts of the world, the African continent is underdeveloped, in the sense that African poverty rates are higher than in other regions of the world and consequently Africans face more severely constrained choice sets than do people in other places.⁴

MAIN FEATURES OF AFRICAN LABOR MARKETS

This study addresses Africa's low income levels and high poverty rates by focusing on potential improvements in labor market conditions. These include factors in labor markets themselves (for example, the number of people wanting to work and the skills they bring to the labor market) and factors impinging on labor markets (the most important being the level and composition of economic activity and the consequent position of the demand curve for labor).

Africa has an employment problem more than an unemployment problem

It is sometimes said that what Africa has is a serious unemployment problem. This study argues instead that what Africa has is an employment problem, with unemployment just a small component of it.⁵ The low quality of employment is evident in the low number of well-paying jobs, low number and uncertainty of work hours in some of these jobs, high levels of casual employment, and inadequate labor regulations and workplace protections. The majority of Africans earn so little that they and their families are poor. Sadly, the title of my 2012 book, *Working Hard, Working Poor*, remains all too relevant for Africa today.

To explain this perspective, consider how employment and unemployment are measured in the statistics of the International Labour

Organization (ILO), the Organisation for Economic Co-operation and Development, and most national governments.

People are counted as employed if they did any work at all for pay or profit during the survey week or worked at least 15 hours not for pay—for example, performing chores on the family farm or some other family enterprise. People are counted as unemployed if they did not work even 1 hour for pay or profit or 15 hours not for pay in the prior four weeks but were actively looking for work—for example, by sending out letters of inquiry about jobs or searching online. Those who were neither employed nor searching for a job—even if they had gotten so discouraged that they gave up looking—are not counted as unemployed; the statistics categorize them as being out of the labor force (or synonymously, economically inactive).

These official measures include in the count of employed persons those who worked only a short time as well as people who worked many hours yet earned so little per hour that they cannot make ends meet. These measures count as unemployed only people who were not employed and who were actively searching for work but not those who were not employed and did not actively search. For these reasons, many analysts regard the unemployment rate as an unsatisfactory measure of labor market distress everywhere, but especially in Africa.⁶

What do data on unemployment and employment in Africa show?

This section presents data for Africa on unemployment and on employment composition by sector, occupational position, and formality/informality.

The level of unemployment

Based on the standard international definition, unemployment rates throughout the world are low, averaging just 5.6 percent overall. By that definition, Africa's unemployment rate is above average, but not terribly high, at 7.9 percent. By region in Africa, the unemployment rate is highest in North

Africa, at 11.7 percent; it is also above the world average in Sub-Saharan Africa, at 7.2 percent.⁷

By this definition, unemployment exhibits two patterns in Africa (and in other developing regions as well). First, unemployment rates are higher for youth than for adults.⁸ One has to be careful, though, not to misinterpret such data. Because most workers and would-be workers are prime-age adults and not youth, despite the higher unemployment rates for youth it is possible for prime-age adults to constitute the major share of the unemployed, and indeed they do: 57 percent in Sub-Saharan Africa and half in North Africa.⁹ Thus, while the youth unemployment problem in Africa is serious and warrants serious attention,¹⁰ it may be getting somewhat more attention than it deserves. It may not be, as some say, Africa's principal labor market problem.

And second, unemployment rates are higher for the best-educated workers in Africa (for example, 34.2 percent in Egypt and 34.9 percent in South Africa) than for the less-educated.¹¹ There are two reasons for that. One is the “luxury unemployment hypothesis”: only Africans from high-income households can afford to spend as long as four weeks without earning anything. The other reason relates to “search unemployment”: the best-educated workers have the most to gain from continuing to engage in job search until one of the best jobs opens up, but people with less education do not have a shot at jobs like those.

The standard definition produces unemployment rates that are misleadingly low indicators of joblessness. Consider the case of Mozambique. A World Bank jobs diagnostic study reports an unemployment rate of 3.6 percent for Mozambique in 2014, based on the ILO definition.¹² Figure 1 shows just how small a sliver of the working age population the unemployed are in Mozambique compared with the employed. However, the unemployment rate reaches 20 percent when a broader definition of unemployment is used that includes idle workers who were either unavailable for work during the reference period but interested in working or available for work but not actively seeking

work. Or consider the case of South Africa, which has one of the world's highest unemployment rates by the ILO definition. By that definition, the unemployment rate is 26.7 percent in 2018, while the national statistical office reports a “broad unemployment rate” that is a full 10 percentage points higher, at 36.7 percent.¹³

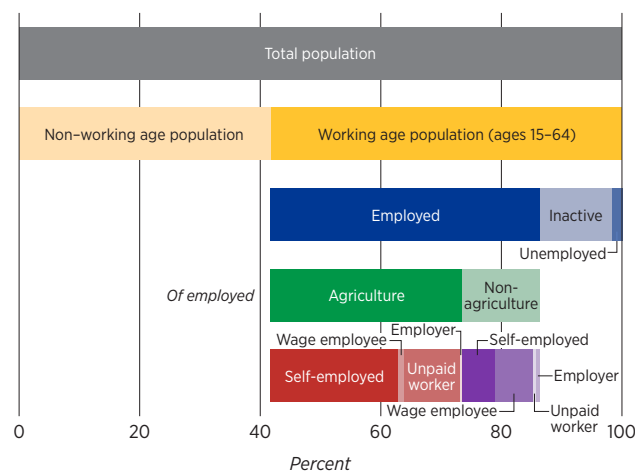
It follows that even when using a broader definition of unemployment than the ILO definition, most Africans of working age are employed. As noted, the simple reason is that most Africans cannot afford not to work.

The composition of employment

As summarized in *African Economic Outlook 2018*, four structural features characterize African labor markets: informality, agriculture's dominance, low-productivity/low-quality employment, and underemployment.¹⁴ These features reflect the fact that Africans are working, they are working hard, but they are working poor.

In high-income countries, most employees work for a wage or salary, and self-employment is such a small share of total employment that entire books on labor economics can be written with barely a

FIGURE 1
The structure of employment and unemployment in Mozambique



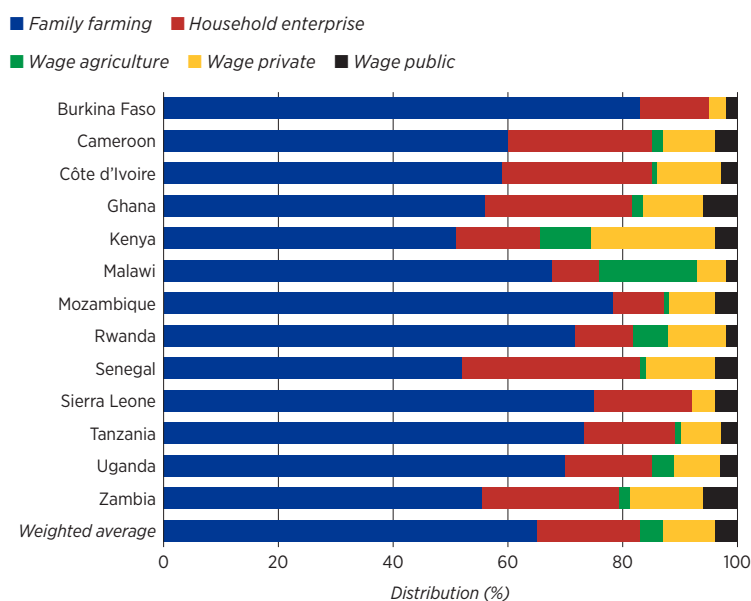
Note: Data from National Statistical Institute (INE), “National Household Income and Expenditure Survey” (IOF) 2014.
Source: Lachler and Walker 2018.

mention of it. In Sub-Saharan Africa, however, only a small percentage of workers are wage and salary employees; most are self-employed in family farming or household enterprises (table 1 and figure 2). Looking across countries, wage and salaried workers as a percentage of the labor force rises as GDP per capita rises, and the percentage of self-employed falls correspondingly (figure 3). The unemployment rate does not vary systematically with development, however, although it varies considerably across countries.¹⁵

One study reports that less than 20 percent of labor force entrants find wage employment in most African countries, though higher rates are reported for Botswana, Nigeria, and South Africa.¹⁶ Of people who do find wage employment, many find only short-term casual jobs. Consequently, only 10 percent of total employment is in permanent wage jobs in the private sector. Another 10 percent is in government jobs (public administration and state-owned enterprises). African countries where permanent/formal wage employment opportunities in the private sector are most abundant are South Africa (46 percent of total employment), Botswana (23 percent), and Egypt (18 percent).¹⁷

FIGURE 2

In Sub-Saharan Africa, most workers are self-employed in family farms or household enterprises



Source: Fox and Sohnesen 2012.

Self-employment. The flip side of the very low rates of wage employment in African countries is the very high rates of self-employment, including

TABLE 1

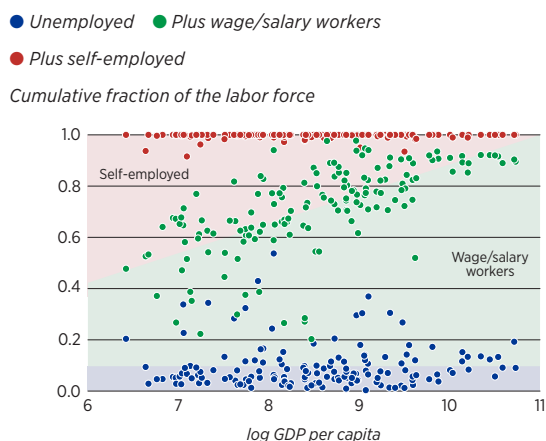
Global distribution of workers by region, income level, and employment category, 2013

Region and income level (number of countries in sample)	Wage and salary employee	Non-paid employee	Employer	Own account
All countries (98)	55.0	13.2	2.9	29.0
Low and middle income countries (74)	49.3	15.4	2.7	32.2
Region (low and middle income countries)				
East Asia and Pacific (6)	43.6	17.4	3.3	35.7
Europe and Central Asia (15)	82.2	5.0	2.6	10.2
Latin America and the Caribbean (20)	67.0	4.5	4.7	23.8
Middle East and North Africa (5)	53.8	17.3	9.4	19.5
South Asia (4)	47.2	18.3	1.2	33.4
Sub-Saharan Africa (24)	17.0	25.1	2.3	55.6
Per capita GNI*				
Low income (18)	25.2	21.6	1.6	51.6
Lower middle income (31)	46.0	18.2	2.4	33.5
Upper middle income (25)	73.1	4.2	4.2	18.6
High income (24)	85.9	1.0	3.7	9.3

* Low income less than 1,006 2010 dollars; lower middle income 1,006–3,975 dollars; upper middle income 3,976–12,275 dollars; high income greater than 12,275 dollars.

Source: Gindling and Newhouse 2014.

FIGURE 3
Relationship between the composition of the labor force and economic development



Source: Poschke 2018.

work in household enterprises.¹⁸ Self-employment rates are 85 percent in Ghana and Madagascar, 83 percent in Mali, and 66 percent in Kenya; in South Africa, though, the rate is just 19 percent, reflecting ongoing efforts to limit self-employment activities such as street-vending, which are free entry in most other countries.¹⁹ Self-employment accounts for half of all employment in West African cities, ranging from 44 percent in Dakar to 63 percent in Bamako.²⁰ Far from indicating that Africans possess particularly entrepreneurial mindsets, these high rates of self-employment are rather an indication of the paucity of wage employment opportunities in Africa and Africans' consequent coping strategies. In the words of one study, Africa is full of "reluctant entrepreneurs."²¹

In the traditional view, self-employment represents a position on the job ladder below wage employment, implying that the self-employed are in that state because they cannot get wage jobs, which would be better for them. As one study characterizes this view: "Jobs exhibit a clear pecking order, with household income and worker education highest for employers, followed by wage and salaried employees, non-agricultural own-account workers, non-agricultural unpaid family workers, and finally agricultural workers."²² Today, though, we understand that there is

an important duality within self-employment and that some of the self-employed are there by choice, be it for reasons of entrepreneurial drive, a desire for independence on the job, or the attractions of being one's own boss.²³

The findings of several studies are consistent with the hypothesis of duality within self-employment. A study in Côte d'Ivoire found that the urban informal sector is an attractive option for some people, whereas other people are rationed out of the formal sector and enter the informal sector as a strategy of last resort.²⁴ Another study found that a sizeable minority of entrepreneurs are "entrepreneurs out of necessity"—about 30 percent in Uganda, for example²⁵—but that most people who operate businesses are "opportunity entrepreneurs."²⁶ A recent study in Madagascar, Malawi, Uganda, and Zambia asked youth "To what extent are you satisfied with your main job?" and linked their answers to the question "Have you chosen to be self-employed or did you have no other option because you could not find a wage or salary job?" The highest job satisfaction is reported by those who chose to be self-employed; essentially tied for second and third place were employees and the non-choice self-employed.²⁷

Agricultural employment. Another characteristic of African employment that stands out is the exceptionally high rate of agricultural employment. Nearly two of three workers in Sub-Saharan Africa (64 percent) are employed in agriculture, compared with 51 percent in South Asia, 41 percent in East Asia, 37 percent in the Middle East and North Africa, and 16 percent in Latin America and the Caribbean (table 2). Even outside of agriculture, however, Sub-Saharan Africa has a much lower rate of wage and salaried employment (13 percent) than the average for low- and middle-income countries (38 percent).

Vulnerable employment and working poverty. In response to the inadequacies of the standard definition of unemployment, the ILO has developed two additional measures of labor market ill fare: "vulnerable employment" and "working poverty."²⁸

Vulnerable employment is defined as own-account (self-employed) workers plus contributing family workers.²⁹ Sub-Saharan Africa is tied with South Asia for the highest rate of vulnerable employment, at 72 percent.³⁰ The global average is 43 percent. Northern Africa has a vulnerable employment rate below the world average, at 30 percent. And in nine Sub-Saharan Africa countries, most new non-farm jobs are generated by households starting enterprises that would be classified by the ILO as vulnerable.³¹

Working poverty encompasses employed workers who live in households with income or consumption below \$1.90 per person per day. According to the ILO, the working poverty rate is higher by far in Sub-Saharan Africa than in any other region in the world: 61 percent, compared with 43 percent in the next-highest region (South Asia), and well above the world average of 27 percent.³²

Informality. Another feature of African labor markets is the exceptionally high rate of informality: 86 percent of the employed population

in Africa are in informal employment compared with 61 percent globally.³³ In addition, 93 percent of new jobs in Africa are in the informal sector.³⁴ Most African workers who are in informal employment are in the informal sector (76.0 percent of all employed); much smaller numbers are informally employed in the formal sector (5.5 percent) and in household enterprises (4.3 percent).³⁵ In West African cities, the sectoral breakdown of employment is 76 percent in the informal sector, 14 percent in the formal private sector, 8 percent in the public sector, and 1 percent in associative business (such as a partnership).³⁶ In Africa as a whole, higher rates of informal employment are found for women than for men, for the young and the old than for 25- to 64-year olds, for the least educated, for people living in rural areas, and for workers in agriculture.

One study has proposed several theories to explain the high rates of informality around the world.³⁷ These views of the informality “decision” all hold to varying degrees:

- The informal sector is a reservoir of potentially productive entrepreneurs who are kept out

TABLE 2

Agricultural and non-agricultural employment in Sub-Saharan Africa and other regions of the world

Region and income level (number of countries in sample)	Wage and salary employee	Non-agriculture			Agriculture
		Non-paid employee	Employer	Own account	
All countries (90)	45.2	2.6	2.1	14.4	35.8
Low and middle income countries (68)	37.9	3.0	1.8	15.7	41.7
Region (low and middle income countries)					
East Asia and Pacific (6)	35.7	4.1	1.8	17.2	41.2
Europe and Central Asia (13)	74.3	0.6	2.6	5.0	17.5
Latin America and the Caribbean (18)	59.2	2.2	3.8	18.5	16.3
Middle East and North Africa (4)	48.0	2.3	4.0	8.7	37.1
South Asia (4)	28.7	3.8	0.7	15.6	51.2
Sub-Saharan Africa (21)	13.4	2.4	1.4	19.0	63.7
Per capita GNI					
Low income (17)	18.6	2.1	1.0	17.9	60.4
Lower middle income (27)	32.2	3.8	1.3	15.6	47.1
Upper middle income (22)	65.2	1.7	3.6	14.3	15.1
High income (24)	84.0	0.4	3.5	7.5	4.6

Source: Gindling and Newhouse 2014.

of formal jobs by high regulatory costs, most notably entry regulations.

- Informal firms are “parasite firms” that are productive enough to survive in the formal sector but choose to remain informal to earn higher profits from the cost advantage of not complying with taxes and regulations.
- Informality is a survival strategy for low-skill individuals, who are too unproductive to become formal.

The study itself favors a dual view of informality: “informal firms stay permanently informal; they hire informal workers for cash, buy their inputs for cash, and sell their products for cash; they are extremely unproductive; and they are unlikely to benefit much from becoming formal.” The remedy, it suggests, is not to increase the supply of educated employees but rather to increase the supply of educated entrepreneurs.

The literature strongly supports the survival strategy view as the predominant explanation. The most compelling evidence is that informality rates in Africa are highest in countries with the lowest rate of unemployment (figure 4). What makes informality so high and unemployment so low is the need for Africans to work and earn, coupled with the availability of fallback employment in own-account self-employment, household enterprises, and agriculture—all overwhelmingly informal. Nor is this explanation limited to Africa. A study on India states: “The informal sector allows for a much needed breathing space for the majority of workers, and the importance of this sector as source of jobs and a cushion for adverse economic shocks has been realized by policymakers.”³⁸

Women face particular difficulties in achieving good employment outcomes. Consequently, they are concentrated in the informal economy, where they face numerous difficulties (see box 2).

Underemployment. One last feature of African labor markets deserves mention, and that is the notion of underemployment.³⁹ Underemployment does not have a standard definition, but two

kinds can be distinguished: time related and invisible. Time-related underemployment is defined as workers who work fewer hours than they would like and is on the order of 10–15 percent of employment in Africa. “Invisible” underemployment is measured by very low labor earnings, low productivity, and low utilization of skills.

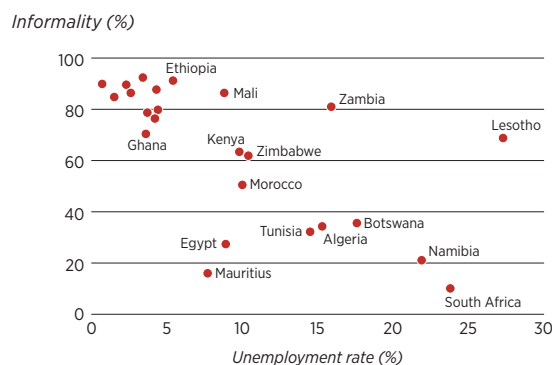
Changes in employment, unemployment, and poverty

Employment in Africa has increased at an average annual rate of 2.8 percent. The African Development Bank estimates positive rates of employment growth in 45 African countries, with questionable data showing negative employment growth for 2 other countries.⁴⁰ The African Development Bank has asserted that “jobless growth is the most serious concern for African policymakers.”⁴¹ Since positive employment growth is not “jobless,” it is more accurate to say that “The challenge of generating more and better employment is the most serious concern for African policymakers.” A related issue is the slow rate of poverty reduction in Africa, which trails Africa’s solid rate of economic growth.

Low quality jobs

The big labor market problem is low job quality. Too few of the jobs that are being created are good jobs. The pace of good job creation has been disappointingly slow. One study finds that 93 percent

FIGURE 4
Unemployment and informality are inversely related in Africa, 2014



Source: Page and Shimeles 2015.

BOX 2

Gender, informality, and poverty

Gender employment in the informal economy

- The majority of women in the informal sector are own account traders and producers or casual and sub-contract workers; relatively few are employers who hire paid workers.
- Men and women tend to be involved in different activities or types of employment even within the same trades. In many countries, for example, male traders tend to have larger scale operations and to deal in non-food items while female traders tend to have smaller scale operations and to deal in food items.

Gender and incomes in the informal economy

- Average incomes of both men and women are lower in the informal sector than in the formal sector.
- The gender gap in incomes and wages appears higher in the informal sector than in the formal sector and exists even when women are not wage workers.
- The relatively large gender gap in incomes and wages in the informal sector is largely due to two interrelated factors:
 - Informal incomes worldwide tend to decline as one moves across the following types of employment: employer, self-employed, casual wage worker, and sub-contract worker.
 - Women worldwide are underrepresented in high-income activities and overrepresented in low-income activities (such as sub-contract work).

Source: Chen 2001.

of all job growth in Africa at the end of the 1990s was in the informal sector.⁴² Another study finds that approximately 90 percent of the jobs created in the region for the early 2000s were in the informal economy.⁴³

The fact that employment in Africa has increased at half the rate of economic growth is sometimes lamented.⁴⁴ However, there is a good explanation for the slower employment growth: Africa does not have massive unemployment, so there is little room for economic growth to result in employment for the unemployed. What could be achieved through rapid economic growth of the right kind would be a faster rate of increase of good jobs. A World Bank study noted about Mozambique that “a focus on increasing the share of ‘good’ jobs in the country is more pertinent than focusing on reducing unemployment.”⁴⁵

What then would be expected to drive employment growth? African economies exhibit (generally)

moderate unemployment rates and (generally) the freedom to create one’s own self-employment opportunity (with the notable exception of South Africa). Taken together, these two factors lead to the expectation that economy-wide employment (by the ILO definition) would increase more in line with the growth of the working age population than with economic growth. Cross-country data show a remarkably tight fit between employment growth and labor force growth, much tighter than the relationship between employment growth and GDP growth. But to repeat: employment growth is not exclusively or even primarily brought about by increased wage employment. The challenge of more good jobs remains a pressing problem of first-order importance throughout Africa.

Structural change has been taking place in African economies, reflecting a pronounced turnaround in recent years.⁴⁶ In the 1990s, structural change was in the wrong direction—a move from high-productivity to low-productivity activities.

For instance, in both Nigeria and Zambia, the employment share of manufacturing and more productive tradable services decreased, while the employment share of agriculture increased. But since 2000, the pattern has reversed: structural change increased productivity, accounting for nearly half of Africa's overall economic growth. Structural reallocation in turn contributed to economic growth in most African countries, accounting for more than half of economic growth in Botswana, Ethiopia, and Mauritania and between a third and a half in Ghana, Morocco, and Uganda.⁴⁷

Slow poverty reduction

Agreement is widespread that the rate of poverty reduction falls short of Africa's rapid rate of economic growth. The share of Africans who are poor, defined as living on less than \$1.90 per person per day in 2011 purchasing power parity dollars, fell from 57 percent in 1990 to 43 percent in 2012.⁴⁸ An important proximate cause of the slow reduction in poverty is the failure of African economies to create enough good jobs.

In summary

To sum up, what Africa has is a jobs problem. Among its manifestation are low earnings for workers, casual employment, uncertainty of work hours, insufficient work hours in some jobs, too few jobs in high paying sectors, and lack of labor regulations and workplace protections. Conditions have been improving, but only slowly.

Let us now turn our attention to policy.

POLICY INTERVENTIONS FOR BETTER LABOR MARKET OUTCOMES

This section addresses two large questions. First, what policy interventions offer the promise of increasing employment opportunities and boosting labor market earnings? And second, what policies and programs that have been tried in other

regions of the world have succeeded in supporting the self-employed?

Increasing employment opportunities and raising the earnings of wage employees and the self-employed are objectives in the service of the higher-level development objective of improving livelihoods. The question, then, is what interventions in the labor market or impinging on the labor market would create better employment and earning opportunities for workers and hence improved livelihoods? The interventions are grouped into three categories: boosting economic growth, increasing employment opportunities and labor market earnings, and supporting the self-employed.

Boosting economic growth

Economic growth is probably the single most important factor influencing labor markets, and therefore growth policies are rightly at the top of many lists of what to do to create more good jobs. An ILO paper on "Employment Policies for Poverty Reduction" concludes that "The most effective way to reduce poverty is to make growth-induced employment accessible to the poor.... For employment to alleviate poverty it must create an entitlement to income."⁴⁹ The paper trumpets the remarkable successes achieved in the Republic of Korea and other East Asian countries.⁵⁰ The channel leading from growth to employment creation to higher incomes to poverty alleviation deserves careful scrutiny in any given country context.

A cautionary word: not all economic growth is labor-using. Some growth is based on natural resources and capital-intensive production methods with correspondingly little use of labor or even the displacement of workers by machines. Simply asking the question "How can we get as many workers as possible into good jobs" may lead policymakers away from the mistaken idea that all economic growth is good for employment.

Economists often say that the demand for labor is derived from the demand for product. This is true, but it is not the whole story and possibly not

even the most important part. A refinement would clarify the principle by adding that the demand for labor is derived from the demand for and supply of product. Even more specifically, the demand for African labor is derived from the demand for and supply of products manufactured in Africa, assembled in Africa, grown in Africa, or processed in Africa. Buyers of cut flowers do not demand African flowers; they demand flowers. The flowers bought in North America and Europe may or may not come from Africa. The African cut flower industry is in competition with actual or potential suppliers throughout the world.

Policymakers need to ask three basic questions:

- What advantages do African economies offer vis-à-vis others? Or put differently, why would companies that have a choice in the matter prefer to operate in Africa than elsewhere?
- What products might be produced in Africa?
- What are the binding constraints and how, if at all, might they be overcome?

Policy suggestions have been put forward in many studies, some of which are discussed below.⁵¹

One study on “Aid, Employment and Poverty Reduction in Africa” proposes a new strategy in support of “structural change for job creation.”⁵² Its main elements are raising agricultural productivity, resetting priorities in favor of private sector development, and finding new opportunities in exports, industry clusters, and expanded capabilities.

Another paper summarizes the lessons from studies of six “African Lions”: Ethiopia, Ghana, Kenya, Mozambique, Nigeria, and South Africa⁵³ and identifies three problems, along with solutions for each:

- *Resource-led growth: An abundance of mineral resources does not automatically limit a nation’s growth potential.* The development benefits of growth depend also on the presence or absence of the requirements for growth, which the review identifies as the quality of institutions, human capital levels, and a sufficiently diversified economy.

- *An absent manufacturing sector: To enable manufacturing to grow, African economies must improve the quantity and quality of human capital, ensure an efficient and enabling regulatory environment, and strengthen infrastructure.*
- *Informalization of labor: Raising the productivity of the informal sector so as to deliver quality employment opportunities requires reforms to the business regulatory environment, investment in basic infrastructure, upgrading of skills for informal sector workers, and strategies and programs to make the informal sector more dynamic and formal.*

Another major strand of work focuses on “industries without smokestacks,” such as tourism, information and communication technologies, and other services, as well as food processing and horticulture.⁵⁴ Such industries have become important in Africa and are likely to become even more important, particularly in tradable services and agro-industrial value chains. The new directions for industrial policy in Africa include reforming the investment climate, mounting an export push, building firm capabilities, creating industry clusters, and establishing a new agenda for aid.⁵⁵

In an address to the international community on the demise of the manufacturing-led export growth model that was successful in the 20th century, Nobel Laureate and former Chief Economist of the World Bank Joseph Stiglitz proposed a 21st century inclusive growth strategy entailing a combination of manufacturing, agriculture, services, and natural resources.⁵⁶ He argued that countries will require active industrial policies based on a new understanding of dynamic comparative advantage. Of particular interest is his contention that governments must ask how its rules, regulations, and expenditures can promote a long-run development strategy. Elements of the new strategy include promoting learning with broad societal spillovers and generating foreign exchange and jobs. At the core of the new strategy is the Stockholm Statement, “Towards a Consensus on the Principles of Policymaking for the Contemporary

World,” signed in November 2012 by Stiglitz and 12 other leading economists from around the world.⁵⁷ Among its six principles are that GDP growth is not an end in itself, development has to be inclusive, and the needs of market, state, and community must be balanced.

Finally, the African Development Bank offers 11 policy recommendations on growth, jobs, and poverty in Africa, many of them aimed at economic growth:⁵⁸

- Improve the regulatory environment.
- Consider wage subsidies.
- Target economically viable activities.
- Invest in industries with high payoffs.
- Attract foreign investors.
- Enter global value chains.
- Build successful special economic zones and industrial parks.
- Invest in infrastructure.
- Modernize agriculture.
- Build human capital.
- Invest in data collection and make data more accessible.

In conclusion, economic growth is important for more and better jobs. The policy measures discussed in this section contain some of the most important aspects of current thinking on the nature of economic growth and the ways of bringing it about.

Increasing employment opportunities and labor market earnings

As discussed above, labor markets are the places where labor services are bought and sold. For a number of reasons, such markets may not work smoothly, and policy interventions may help them work more smoothly. One example is setting up employment exchanges and other labor market information systems so that the buyers and sellers of labor services can more easily find one another, thereby reducing frictional unemployment. By facilitating the geographic mobility of labor so that workers can be where the jobs are, such policies can help overcome structural unemployment

of the geographic variety. Another example is investing in human capital formation, thereby helping to overcome structural unemployment due to skills mismatches when employers have positions they want to fill but workers with the desired skills are not available. These and other labor market interventions are discussed below.

Job creation and wage policies

One approach is direct job creation, which is often a component of a social safety net program and is sometimes referred to as “workfare.” Whether jobs in workfare programs are attractive to workers depends in part on what other jobs are available in the labor market. In rural India, the National Rural Employment Guarantee Act not only guarantees employment to all who want it, particularly in the slack agricultural seasons, but does so at a wage at or above the going wage in many locations. The program has had some administrative difficulties, but high take-up is not one of them. More recently, Ethiopia introduced a new Urban Productive Safety Net Project. The poor are offered income assistance, in exchange for which they are required to sweep the streets for three hours a day. The pay is not much, but it is better than anything else the participants might be doing.

In some countries, employment is less than it might otherwise be because wages, mandated benefits, and other labor costs have been pushed above market levels by minimum wage laws, labor codes, trade unions, and government pay practices, among others. Employment could be stimulated by lowering labor costs, but this may exchange one problem (lack of employment) for another (lower pay for workers). Neither is the obviously right thing to do in general.

Active labor market policies

Through active labor market policies, governments intervene directly in the labor market to try to generate more and better employment outcomes for workers. A review of active labor market policies in developing countries examined three such classes of interventions: vocational training, wage subsidies, and job search and matching assistance.⁵⁹

Vocational training. Of nine studies of vocational training analyzed in the review, only three find a statistically significant effect on employment, and only two find a statistically significant effect on earnings.

Wage subsidies. Wage subsidies are sometimes given to workers, and sometimes given to firms. Wage subsidy programs in Argentina and South Africa required firms receiving a wage subsidy to register new workers with the authorities and to make severance payments to workers who were laid off. Remarkably little hiring took place: just 3 workers in Argentina and 30 workers (of 1,500 given the voucher) in South Africa. The reason for such small employment effects was the reluctance of firms to face the labor regulations associated with hiring subsidized workers. In Jordan, though, where recipient firms were not required to register workers, there was a 38 percentage point increase in employment while the subsidy was in effect. However, as soon as the subsidy ended, employment reverted to its previous level, with the result that the subsidies produced no significant impact on employment in the long-term.

Job search and matching assistance. Some labor markets simply do not work well in bringing workers and employers together. The review of nine studies on the impact of job search and matching assistance in seven developing countries (Ethiopia was examined in three studies) found only two with statistically significant employment effects and none with statistically significant earnings effects.⁶⁰ The reason adduced for the failure of search and matching assistance to make much of a difference is that the labor markets in question appear to function reasonably well. For getting more workers employed (as opposed to increasing any given worker's chance of being hired from among a large pool of applicants), search and matching assistance looks to be the wrong intervention: "Many active labor market policies are much less effective than policymakers typically assume."⁶¹

Other policy measures. The active labor market policies examined in the review do not stand up

well to careful impact evaluation. It is possible that alternative policies would do better. Two types of policies that have been suggested are policies to address the constraints the firms face in innovating, growing, and creating more jobs, and policies to help workers access different labor markets and overcome sectoral and spatial mismatches on the labor supply side.⁶² As a general issue, the author of the review worries about the level of analysis. These evaluations are focused on individuals, not on the market: "A key concern with policies directed at particular job-seekers is that they merely change who gets the jobs that firms are advertising, without increasing the total number of jobs available."⁶³ More market-level analysis is urgently needed.

Equality of opportunity

Nonetheless, there may be a societal desire to place certain types of workers—those who had been denied employment opportunities in the past (such as the poor, women, and minority tribal or ethnic groups)—into good jobs, understanding that doing so may not increase total employment but rather may change the mix between those who are employed and those who are not. Employing the traditionally disadvantaged is a laudable aim, but it is a different aim from creating more wage employment overall. These two aims are often conflated in policy discussions; they should be kept separate.

Supporting the self-employed

With six times as many Africans in self-employment as in wage employment, programs in support of the self-employed are particularly important. Accordingly, it is worth looking at interventions that have been tried around the world to support the self-employed. Several large-scale reviews of such policies together offer a wealth of information—much more than can be covered here.

Agriculture. Agriculture is the predominant sector of employment and self-employment in Africa, with a commensurately huge literature, including

sets of policy recommendations. The World Bank's *World Development Report 2008* set forth an "Agriculture for Development" agenda:⁶⁴ improve market access and establish efficient value chains, enhance smallholder competitiveness, facilitate market entry, improve livelihoods in subsistence agriculture and low-skill rural occupations, increase employment in agriculture and the rural nonfarm economy, and enhance skills.

The Alliance for a Green Revolution in Africa put forward four key messages:⁶⁵ First, African smallholders have historically been able to compete locally and globally across a variety of value chains. Second, the rapidly transforming agricultural value chains, driven by urbanization and rising incomes, create significant market and income opportunities for smallholder farms. Third, a key strategic priority is to foster institutional innovations that integrate smallholder farmers as credible business partners into modern value chains. And fourth, to reach the largest number of dispersed smallholder farmers, the most likely strategy is to modernize a critical mass of producer organizations with enhanced commercial and technical skills.

The African Development Bank has identified three priority policy interventions to modernize the agricultural sector: ensuring "acceptably egalitarian" access to land; facilitating the use of modern inputs, seeds, and technologies by improving access to credit and by other means; and strengthening the ability to develop and adapt agricultural technologies.⁶⁶

On the specific question of what works to raise the incomes of small-scale farmers, a comprehensive review of field experiments concluded that:⁶⁷

- Access to information on agricultural technologies have been effectively improved through extension services, training, social networks, and nudges.
- Credit markets typically fail more for poor people than for others due to a lack of collateral. However, an inability to reduce risk has often proved to be a more serious constraint for farmers than lack of credit.
- Index-based weather insurance, despite its potential attractiveness in helping deliver insurance to smallholder farmers, has been resisted. Increasing uptake has required heavy subsidies.
- Setting optimal price subsidies requires estimating full price response functions, which is difficult to do because of the endogeneity of prices and simultaneity between supply and demand.
- Providing price information to farmers has not proven effective in helping farmers. Better information might improve the welfare of traders, however.
- Contracts along value chains can induce smallholder farmers to switch to the production of high-value crops.
- In view of the considerable heterogeneity in the conditions faced by farmers of different types and in different contexts, innovations, programs, and policies directed to them need to be correspondingly differentiated and targeted.

Youth unemployment. Another issue attracting attention is youth unemployment. Two comprehensive reviews offer a detailed look at the issue.⁶⁸

One review of more than a hundred studies of programs for youth employment addressed the question of what works for youth employment in low-income countries.⁶⁹ Of the studies reviewed, 17 involved interventions in support of self-employment and the rest in support of wage employment. Among the headline results:⁷⁰

- Alleviating the startup capital constraint through grants or loan finance has proved effective in getting businesses started.
- Technical and vocational training has generated mixed results. To illustrate, the Uganda program increased both non-farm employment and earnings relative to the control group, but the Kenya and Malawi programs had no effects.
- Results for business skills training were also mixed.

- Programs to overcome constraints in the business environment have been launched but not evaluated experimentally. These include access to work and sales space, infrastructure, protection from crime or predatory behavior by the authorities, and access to markets, including integration into productive value chains.
- It is easier to enhance self-employment than to expand employment in existing firms.
- Finance alone is less effective than training or business development services alone.
- Randomized controlled trials find systematically smaller employment effects than do quasi-experimental studies.
- There is very little evidence on long-term effects and cost effectiveness.

A second review conducted a meta-analysis of 107 youth employment programs aimed at raising the employment, earnings, and business-performance outcomes of youth around the world.⁷¹ The interventions included entrepreneurship promotion, skills training, subsidized employment programs, and employment services. Entrepreneurship promotion had the highest overall impact on youth employment and earnings and business performance outcomes. Youth training programs also had a substantial positive impact. Subsidized employment interventions improved employment outcomes but not employment earnings. And job search assistance and counseling programs had statistically insignificant effects. More specifically:

- One of three youth employment programs had positive and statistically significant impacts on labor market outcomes.
- Youth employment programs had more positive effects in low- and middle-income countries than in higher-income ones.
- The positive effects of the programs increased over time.
- Program intensity and scale were key to achieving positive and long-lasting impacts.

Micro and small enterprise promotion and business training. Another focus of policy discussion is micro-entrepreneurship and small and medium-size enterprises. A review of 53 interventions providing access to finance, entrepreneurship training, business development services, wage subsidies, and promotion of formalization looked at whether such interventions create jobs, and if so, which interventions are more effective?⁷²

The principal findings are:

- The employment effects of entrepreneurship interventions have been very small.

A review of impact evaluations of business training around the developing world looked at the impacts on business start-up and survival, business practices, business profits and sales, and employment.⁷³ The review found that only a small minority of studies report statistically significant effects, in some cases because the effects were statistically insignificant and in others because no point estimates and associated confidence intervals were reported.

A study of entrepreneurship in Latin America holds lessons for Africa.⁷⁴ The study found many firms but little innovation. To remedy this situation, it identified several areas for policy action. First, it is important to get the level of competition right—neither too much nor too little.⁷⁵ Second, Latin America needs to close the human capital gap, including in years of schooling, quality of education, and subject matter. The dearth of engineers is a particularly serious constraint. The historical experience of the United States in making major investments in mining and engineering education a century ago serves as a model for what Latin America might do today. A third policy area is to establish a more enabling business regulatory environment. Fourth, while access to credit seems not to be a major constraint, the weak contractual environment is a limiting factor. And fifth, contract enforcement in general and protection of intellectual property rights in particular are important issues. All of these reforms seem equally pertinent to Africa today.

And finally, a study linked entrepreneurship promotion and youth employment and drew several practical lessons.⁷⁶ First, successful promotion of

youth entrepreneurship and self-employment requires better access to credit. Second, the most effective entrepreneurship training combines core business administration skills such as accounting with softer entrepreneurial skills such as problem-solving. Third, programs should clearly separate training and financing functions. Those in livelihood self-employment should be treated as a different group than entrepreneurs, especially in low-income countries. Fourth, measures to improve the situation of the most vulnerable groups of self-employed, such as the poor, women, and migrants, should be targeted to the specific needs of each group. Fifth, programs need to address people's empowerment. And finally, a successful example of a holistic approach to support the self-employed is the Self Employed Women's Association of India (SEWA).

In summary

The reviews summarized here covered hundreds of studies of how to stimulate economic growth, how to increase paid employment, and how to raise the incomes of the self-employed. The majority of the programs do not exhibit statistically significant effects. Those that are statistically significant do not cluster neatly in ways that would permit statements of the type “this sort of intervention generally brings about significantly better outcomes and that sort does not.” The results of the studies are often too nuanced and too specific to their contexts to permit ready generalizations. Still, much has been learned, and policymakers should heed their lessons carefully.

NOTES

1. This statement was made in the context of South Africa (Schottea, Zizzamia, and Leibbrandt 2017).
2. World Bank 2013.
3. Beegle et al. 2016.
4. I define “underdevelopment” as the existence of severely constrained choice sets and “economic development” as the process of relaxing those constraints, thereby enabling people to attain higher material standards of living.
5. The terminology “employment problem” was popularized decades ago by Turnham (1971, 1993) and Squire (1981).
6. For an in-depth and lucid discussion of these limitations in the context of Africa, see Fox and Pimhidzai (2013). In addition, valuable predecessor studies to this one include *African Statistical Yearbook* (African Development Bank 2013) and chapter 2 of *African Economic Outlook* (African Development Bank 2018).
7. ILO 2018b.
8. AfDB 2013.
9. AfDB 2013.
10. For example, see Filmer and Fox (2014).
11. AfDB 2013.
12. Lachler and Walker 2018.
13. Statistics South Africa 2018.
14. AfDB 2018.
15. Poschke 2018.
16. Page and Shimeles 2015.
17. Stampini et al. 2013.
18. Fox and Sohnesen 2012; Fields 2014.
19. Banerjee and Duflo 2011.
20. de Vreyer and Roubaud 2013.
21. Banerjee and Duflo 2011.
22. Gindling and Newhouse 2014.
23. Fields 1990, 2012.
24. Günther and Launov 2011.
25. Poschke 2013.
26. Poschke 2013. Entrepreneurs are defined in this study as people who derive income from running a business of which they own a share, whether they employ others or not. “Entrepreneurs out of necessity” are those who, when asked “Are you involved in this start-up firm to take advantage of a business opportunity or because you have no better choices for work,” opt for the second response. The remaining entrepreneurs are called “opportunity entrepreneurs.”
27. McKay, Newell, and Rienzo 2018.
28. ILO 2018b.
29. Contributing family workers are workers who hold “self-employment jobs” as own-account workers in a market-oriented establishment operated by a related person living in the same household.
30. ILO 2018b.
31. Fox and Sohnesen 2012.
32. ILO 2018b.

33. ILO 2018a.
34. Chen 2001.
35. The precise definitions of informal sector and informal employment are very detailed (ILO 2018a), but the essential distinction is that employment in the informal sector is an enterprise-based concept and is defined in terms of the characteristics of the place of work of the worker. By contrast, informal employment is a job-based concept and is defined in terms of the employment relationship and protections associated with the job of the worker. An informal worker in the formal sector is one who does not receive the benefits and protections associated with formal employment, either because the firm is evading the law or because the law does not apply (for example, because workers become protected after 90 days of employment but the worker in question has not been employed for that length of time).
36. de Vreyer and Roubaud 2013.
37. La Porta and Shleifer 2014.
38. Raj and Sen 2016.
39. de Vreyer and Roubaud 2013.
40. AfDB 2018.
41. AfDB 2018.
42. Chen 2001.
43. AfDB (2013), based on ILO data.
44. AfDB 2018.
45. Lachler and Walker 2018.
46. McMillan, Rodrik, and Verduzco-Gallo 2014.
47. AfDB 2018.
48. Beegle et al. 2016.
49. Khan 2001.
50. See, also, World Bank (1993) and McMillan, Rodrik, and Verduzco-Gallo (2014).
51. Three other places to start to look for answers are the new literatures on growth diagnostics, complexity analysis in product choice, and enterprise maps.
52. Page and Shimeles 2015.
53. Bhorat and Tarp 2016.
54. Newman et al. 2016a; Newman et al. 2016b; Newfarmer, Page, and Tarp 2018.
55. For research on building firm capabilities, see Bloom et al. (2014).
56. Stiglitz 2018.
57. For details, see <https://www.sida.se/globalassets/sida/eng/press/stockholm-statement.pdf>.
58. AfDB 2018.
59. McKenzie 2017.
60. McKenzie 2017.
61. McKenzie 2017.
62. McKenzie 2017.
63. McKenzie 2017.
64. World Bank 2008.
65. AGRA 2017.
66. AfDB 2018.
67. de Janvry, Sadoulet, and Suri 2017.
68. Fox and Kaul 2017; Kluve et al. 2016.
69. Fox and Kaul 2017.
70. Fox and Kaul 2017.
71. Kluve et al. 2016.
72. Grimm and Paffhausen (2015), building on a previous synthesis of evidence by Cho and Honorati (2014) and adding a further 39 studies.
73. McKenzie and Woodruff 2013.
74. Lederman et al. 2014.
75. Aghion et al. 2005.
76. Pieters 2013.

REFERENCES

- African Development Bank. 2013. *African Statistical Yearbook*. Abidjan, Côte d'Ivoire.
- . 2018. *African Economic Outlook 2018*. Abidjan, Côte d'Ivoire.
- Aghion, P., N. Bloom, R. Blundell, R. Griffith, and P. Howitt. 2005. "Competition and Innovation: An Inverted U Relationship." *Quarterly Journal of Economics* 120 (2): 701–728.
- AGRA (Alliance for a Green Revolution in Africa). 2017. *Africa Agriculture Status Report 2017*. Nairobi, Kenya.
- Banerjee, A., and E. Dufo. 2011. *Poor Economics*. New York, NY: Public Affairs Press.
- Beegle, K., L. Christiaensen, A. Dabalen, and I. Gaddis. 2016. *Poverty in a Rising Africa*. Washington, DC: World Bank.
- Bhorat, H., and F. Tarp. 2016. *Africa's Lions: Growth Traps and Opportunities for Six African Economies*. Washington, DC: Brookings Institution Press.
- Bloom, N., G. Fischer, I. Rasul, A. Rodriguez-Clare, T. Suri, C. Udry, E. Verhoogen, C. Woodruff, and G. Zane.

2014. "Firm Capabilities and Economic Growth." International Growth Centre Working Paper. London, UK.
- Chen, M. A. 2001. "Women and Informality: A Global Picture, the Global Movement." *SAIS Review* 21 (1): 71–82.
- Cho, Y., and M. Honorati. 2014. "Entrepreneurship Programs Around the Developing World: A Meta Analysis." *Labour Economics* 28 (1): 110–130.
- de Janvry, A., E. Sadoulet, and T. Suri. 2017. "Field Experiments in Developing Country Agriculture." In *Handbook of Economic Field Experiments*, ed. A. Banerjee and E. Duflo. Amsterdam, Netherlands: Elsevier.
- de Vreyer, P., and F. Roubaud. 2013. *Urban Labor Markets in Sub-Saharan Africa*. Washington, DC: World Bank.
- Fields, G. S. 1990. "Labor Market Modeling and the Urban Informal Sector: Theory and Evidence." In *The Informal Sector Revisited*, ed. D. Turnham, B. Salomé, and A. Schwarz. Paris, France: Organization for Economic Cooperation and Development.
- . 2012. *Working Hard, Working Poor*. New York, NY: Oxford University Press.
- . 2014. "Self-Employment and Poverty in Developing Countries." IZA World of Labor. Bonn, Germany.
- Filmer, D., and L. Fox. 2014. *Youth Employment in Sub-Saharan Africa*. Washington, DC: World Bank.
- Fox, L., and U. Kaul. 2017. *What Works for Youth Employment in Low-Income Countries?* Washington, DC: United States Agency for International Development (USAID).
- Fox, L., and O. Pimhidzai. 2013. "Different Dreams, Same Bed: Collecting, Using, and Interpreting Employment Statistics in Sub-Saharan Africa—The Case of Uganda." World Bank Policy Research Working Paper 6436. Washington, DC.
- Fox, L., and T. Pave Sohnesen. 2012. "Household Enterprise in Sub-Saharan Africa: Why They Matter for Growth, Jobs, and Poverty Reduction." World Bank Working Paper. Washington, DC.
- Gindling, T.H., and D. Newhouse. 2014. "Self-Employment in the Developing World." *World Development* 56 (1): 313–331.
- Grimm, M., and A. L. Paffhausen. 2015. "Do Interventions Targeted at Micro-Entrepreneurs and Small and Medium-Sized Firms Create Jobs? A Systematic Review of the Evidence for Low- and Middle-Income Countries." *Labour Economics* 32 (1): 67–85.
- Günther, I., and A. Launov. 2011. "Informal Employment in Developing Countries: Opportunity or Last Resort?" *Journal of Development Economics* 97 (1): 88–98.
- ILO (International Labour Organization). 2018a. *Women and Men in the Informal Economy: A Statistical Picture*. Geneva, Switzerland.
- . 2018b. *World Employment Social Outlook 2018*. Geneva, Switzerland.
- Khan, A.R. 2001. "Employment Policies for Poverty Reduction." ILO Issues in Employment and Poverty Discussion Paper No. 1. Geneva, Switzerland.
- Kluge, J., S. Puerto, D. Robalino, J. M. Romero, F. Rother, J. Stöterau, F. Weidenkaff, and M. Witte. 2016. "Do Youth Employment Programs Improve Labor Market Outcomes? A Systematic Review." IZA Discussion Paper No. 10263. Bonn, Germany.
- La Porta, R., and A. Shleifer. 2014. "Informality and Development." *Journal of Economic Perspectives* 28 (3): 109–126.
- Lachler, U., and I. Walker. 2018. *Jobs Diagnostic Report for Mozambique*. Washington, DC: World Bank.
- Lederman, D., J. Messina, S. Pienknagura, and J. Rigolini. 2014. *Latin American Entrepreneurs: Many Firms but Little Innovation*. Washington, DC: World Bank.
- McKay, A., A. Newell, and C. Rienzo. 2018. "Job Satisfaction Among Young Workers in Eastern and Southern Africa: A Comparative Analysis." University of Sussex Working Paper. Brighton, UK.
- McKenzie, D. 2017. "How Effective Are Active Labor Market Policies in Developing Countries? A Critical Review of Recent Evidence." *The World Bank Research Observer*. Washington, DC: World Bank.
- McKenzie, D., and C. Woodruff. 2013. "What Are We Learning from Business Training and Entrepreneurship Evaluations Around the Developing World?"

- The World Bank Research Observer*. Washington, DC: World Bank.
- McMillan, M., D. Rodrik, and Í. Verduzco-Gallo. 2014. "Globalization, Structural Change, and Productivity Growth, with an Update on Africa." *World Development* 63 (1): 11–32.
- Newfarmer, R. S., J. Page, and F. Tarp. 2018. *Industries without Smokestacks: Industrialization in Africa Reconsidered*. Oxford, UK: Oxford University Press.
- Newman, C., J. Page, J. Rand, A. Shimeles, M. Soderbom, and F. Tarp. 2016a. *Made in Africa*. Washington, DC: The Brookings Institution.
- . 2016b. *Manufacturing Transformation: Comparative Studies of Industrial Development in Africa and Emerging Asia*. Oxford, UK: Oxford University Press.
- Page, J., and A. Shimeles. 2015. "Aid, Employment and Poverty Reduction in Africa." *African Development Review* 27 (S1): 17–30.
- Pieters, J. 2013. *Youth Employment in Developing Countries*. IZA Research Report No. 58. Bonn, Germany.
- Poschke, M. 2013. "Entrepreneurs Out of Necessity: A Snapshot." *Applied Economics Letters* 20 (1): 658–663.
- . 2018. "Wage Employment, Unemployment, and Self-Employment Across Countries." International Growth Centre Working Paper. London, UK.
- Raj, R.S.N., and K. Sen. 2016. *Out of the Shadows: The Informal Sector in Post Reform India*. Uttar Pradesh, India: Oxford University Press.
- Schottea, S., R. Zizzamia, and M. Leibbrandt. 2017. "Social Stratification, Life Changes and Vulnerability to Poverty in South Africa." University of Cape Town SALDRU Working Paper 208. Cape Town, South Africa.
- Squire, L. 1981. *Employment Policy in Developing Countries: A Survey of Issues and Evidence*. New York, NY: Oxford University Press.
- Stampini, M., R. Leung, S.M. Diarra, and L. Pla. 2013. "How Large Is the Private Sector in Africa? Evidence from National Accounts and Labor Markets." *South African Journal of Economics* 81 (1) 140–165.
- Statistics South Africa. 2018. *Quarterly Labour Force Survey*. Pretoria, South Africa.
- Stiglitz, J.E. 2018. "From Manufacturing Led Export Growth to a 21st Century Inclusive Growth Strategy: Explaining the Demise of a Successful Growth Model and What to Do About It." Keynote speech delivered to the UNU-WIDER "Think Development–Think WIDER" conference, Helsinki, Finland.
- Turnham, D. 1971. *The Employment Problem in Less Developed Countries*. Paris, France: Organization for Economic Cooperation and Development (OECD).
- . 1993. *Employment and Development: A New Review of Evidence*. Paris, France: Organization for Economic Cooperation and Development (OECD).
- World Bank. 1993. *The East Asian Miracle*. Washington, DC.
- . 2008. *World Development Report 2008: Agriculture for Development*. Washington, DC.
- . 2013. *World Development Report 2013: Jobs*. Washington, DC.

MANUFACTURING EMPLOYMENT IN AFRICAN COUNTRIES

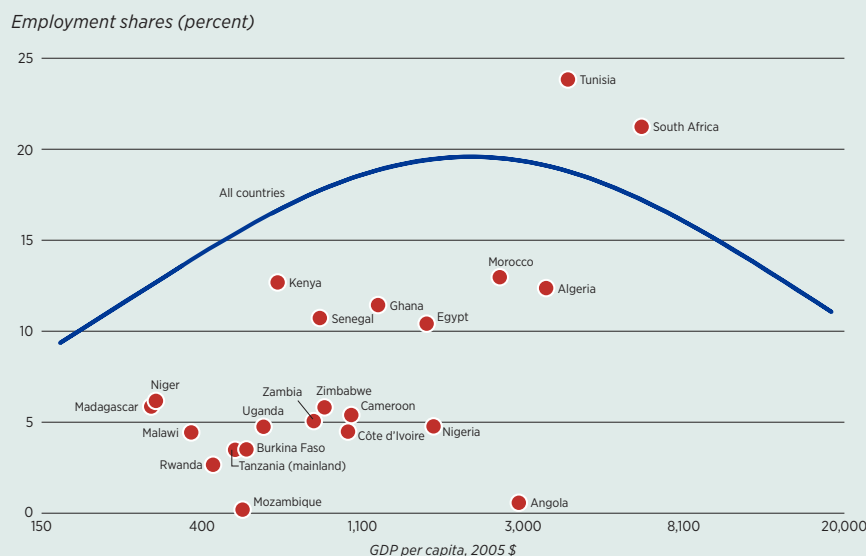
Nobuya Haraguchi, United Nations Industrial Development Organization

Structural transformation of industries—building additional efficient and effective productive capacity and supporting economic diversification—is a key driver of economic growth and job creation and a major part of the economic structures needed to end poverty. Countries with a low level of industrialization generally have high poverty rates, high income inequality, or both, reducing living standards and opportunities for upward mobility. Modern economic growth, driven by industrialization, is crucial for providing people with access to upward social and economic mobility.¹

The main vehicle for poverty reduction through industrialization is the generation of manufacturing jobs. In low-income countries, such jobs are often more productive than agricultural jobs. They help absorb surplus labor from low-productivity sectors, lifting the productivity of the entire economy. From countries with a fairly low income per capita of \$400 to countries with an upper middle income per capita of \$8,100, the manufacturing sector normally accounts for 15–20 percent of total employment (figure 1).

Most African countries had very low manufacturing employment shares in 2012. These low levels have meant low economy-wide productivity² and limited

FIGURE 1
Relationship of manufacturing employment shares in total employment to GDP per capita, 1970–2012



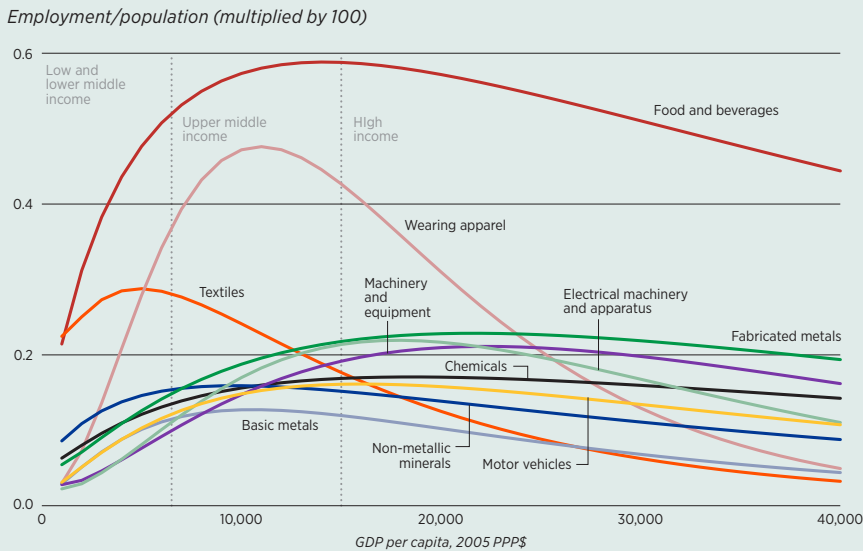
Note: Data for 1970–1991 are for 109 countries. From 1991 on, the data include 124 countries following the dissolution of the Soviet Union and Yugoslavia. The geographic coverage of countries remains consistent for the entire period of analysis, 1970–2012.
 Source: Calculations based on data from the Groningen Growth Development Centre; ILO (2012); and ILO (n.d.).

the access to decent jobs with upward mobility.

Labor-intensive industries such as food and beverages, textiles, and apparel³ are the major sources of manufacturing employment in countries at an early stage of development; other industries do not reach the same peak employment levels in countries at any income (figure 2). Of the three industries, the food and beverage industry is more domestic-market

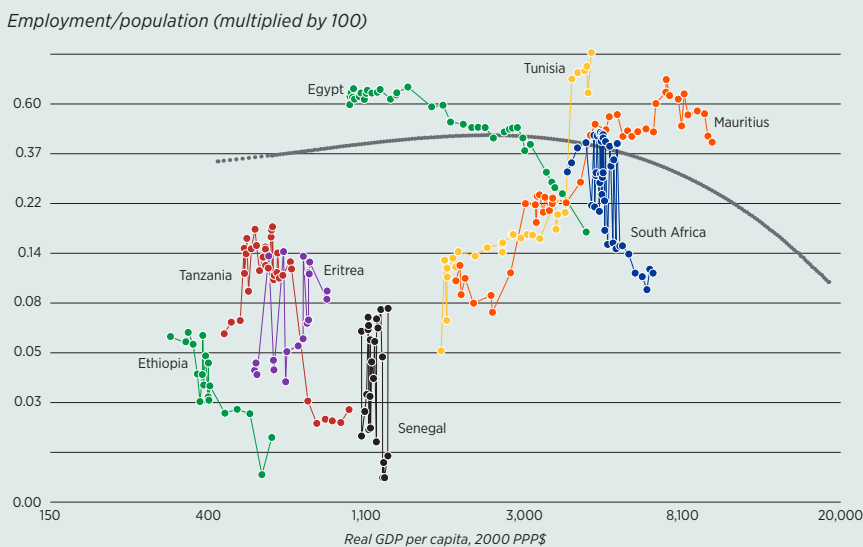
oriented; its sustained growth depends largely on domestic market expansion and rising national income.⁴ The textile and apparel industries are more export-oriented and thus their growth depends more on external market expansion, a surer route to economic growth. Thus, the development of those two industries can contribute much to African countries' economic transformation through industrialization and manufacturing employment generation.

FIGURE 2
Global relationship of employment in manufacturing industries to GDP per capita



Note: Pooled data for 95 countries for 1963–2007.
 Source: UNIDO 2013.

FIGURE 3
Global relationship of textile industry employment to GDP per capita, 1970–2012



Note: Includes countries with employment data for both the textile and wearing apparel industries. Employment is normalized using per capita employment ($\times 100$) to make cross-country comparison possible.
 Source: Calculations based on INSTAT 2 Revision 3 and World Bank (2015).

Employment levels in the textile and apparel industries in African countries, with a few exceptions such as Mauritius and Tunisia, are below the global average (figures 3 and 4).

The low income levels in most African countries indicate a high potential for African countries to develop labor-intensive industries if the conditions are right. Cost is important. Low cost is a minimum requirement to compete in labor-intensive industries, but countries in a broad range of income levels—possibly up to GDP per capita of \$8,000–\$9,000—share this advantage.⁵ Developing countries with low labor costs have a latent comparative advantage in labor-intensive manufacturing, but only a handful of countries have transformed this advantage into industrial growth because of other constraints.

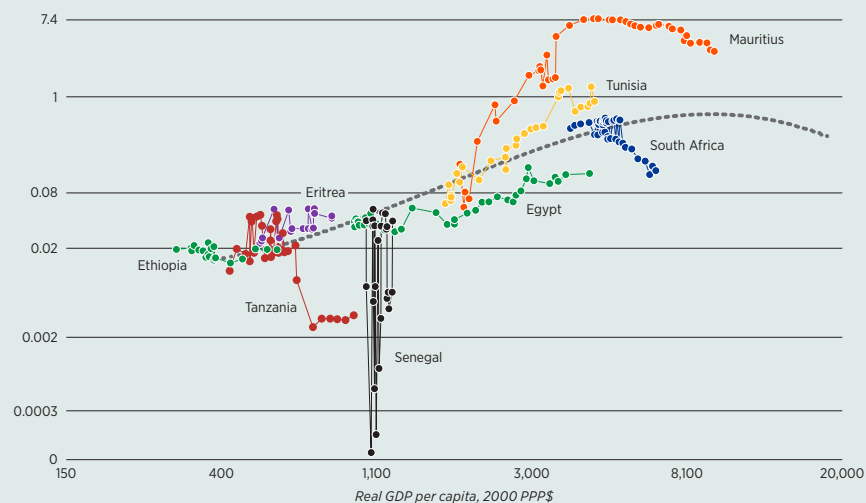
Countries with abundant cheap labor also need other production costs to be low and to have low total costs, which together with product quality determine an industry’s competitiveness. Productivity needs to be high enough that the advantage of low labor costs is translated into low unit labor costs. To retain the advantage of low production costs in total cost, countries need to keep transaction costs competitive, including the cost of energy, transportation, administration, and storage, and to benchmark costs against the unit labor costs of leading world producers.

Success in producing low-end products in labor-intensive industries will enable African countries to gradually upgrade

FOCUS 4

FIGURE 4
Global relationship of apparel industry employment to GDP per capita, 1970–2012

Employment/population (multiplied by 100)



Note: Includes countries with employment data for both the textile and wearing apparel industries. Employment is normalized using per capita employment ($\times 100$) to make cross-country comparison possible. Source: Calculations based on INSTAT 2 Revision 3 and World Bank (2015).

their products. That should provide countries with greater opportunities for value addition through productivity increases, allowing them to remain cost competitive even while increasing wages.

Notes

1. Kuznets 1966.
2. McMillan, Rodrik, and Verduzco-Gallo 2014.
3. The apparel industry includes footwear and leather products.

4. Depending on countries, some products in the food and beverages industry such as processed fruits could be highly export-oriented.
5. In purchasing power parity terms in constant 2005 prices (UNIDO 2013).

References

- ILO (International Labour Organization). 2012. *Key Indicators of the Labour Market, Seventh Edition*. Geneva.
- . n.d. ILOSTAT [database]. Geneva.
- Kuznets, S. 1966. *Modern Economic Growth*. New Haven, CT: Yale University Press.
- McMillan, M., D. Rodrik, and Í. Verduzco-Gallo. 2014. “Globalization, structural change, and productivity growth, with an update on Africa.” *World Development* 63: 11–32.
- UNIDO (United Nations Industrial Development Organization). 2013. *Industrial Development Report 2013*. Vienna.
- World Bank. 2015. *World Development Indicators*. Washington, DC.



THE COST OF INACTION: OBSTACLES AND LOST JOBS IN AFRICA

Andinet Woldemichael

African Development Bank

and

Margaret Jodlowski

Cornell University

 @a_woldemichael


In a competitive market, the constant “churning” of firms into and out of business boosts productivity, economic growth, and net job creation. Without competitive markets, however, firm exit and the failures of firm entry could be due to obstacles other than competition and innovation. In African countries, incumbent firms and potential entrants face immense obstacles: a difficult political environment, burdensome business regulations, inadequate infrastructure, and limited access to finance. This study investigates the extent to which such obstacles hinder job creation in general and firm dynamism in particular. Using World Bank Enterprise Survey (ES) panel data that cover 18 African countries, the study quantifies the number of jobs lost due to obstacles. It finds that a single obstacle reduces annual employment growth by 0.1–0.34 percentage point. Hence, by removing key business obstacles, Africa could boost new job creation and save many existing high-quality jobs.

INTRODUCTION

Africa has no shortage of labor supply. But it lacks high-productivity job opportunities in high-productivity nonagricultural sectors. Its relatively rapid and sustained economic growth over the past decade did not yield enough jobs for the growing wave of jobs seekers—mainly youth in urban areas. Nonagricultural employment continues to be dominated by the informal sector, where wages are low, benefits nonexistent, workplace safety absent, and labor exploitation common. With significant demographic change expected to bring pressure on African labor markets, the urgency of creating high-quality and remunerative jobs at a much faster pace is not only an economic issue but a political and social one. This study investigates the extent to which failure to remove

business constraints hinders actual and potential job growth. In particular, using World Bank Enterprise Survey (ES) panel data, the study quantifies the number of actual jobs lost due to the impact of business obstacles on firm survival and employment growth.

In a competitive market, new firms continually come into existence, and existing ones readjust their factors of production—capital and labor—from less productive activities to more productive ones, or else they cease operation. The entry and exit of firms are outcomes of competition and innovation through which markets efficiently reallocate resources.¹ The literature refers to this creative destruction process as market “churning.” As budding, more productive enterprises flourish, the market shakes off the less productive ones. In



a competitive market, where there are few barriers to potential entrants and easy exit for less efficient firms, churning of firms is desirable. It increases productivity, economic growth, and net job creation.²

When markets are not competitive, firms' exit, firms' failure to enter, and the consequent reduction in employment growth can be caused by artificial obstacles that lead to inferior business dynamism. This particularly happens in developing and emerging countries, where firms exit and potential new firms fail to become operational just because they face insurmountable obstacles. The resulting high rate of firm exit and low rate of entry lower the rate of net job creation.

Among obstacles, strict labor regulations stifle firms' growth by raising the opportunity cost of hiring and firing.³ They are more burdensome for smaller firms than larger ones because the smaller ones have a more limited capacity to adhere to the regulations.⁴ Similarly, Micco and Pages found a negative relationship between employment protection laws and labor turnover, while Mondino and Montoya showed that labor regulations can reduce labor market flexibility and generate societal inequalities.⁵

In addition to business-friendly regulations and tax systems, property rights systems play important roles in firms' investment decisions. In China, for instance, entrepreneurs are more likely to invest if they are confident in the property rights system and have access to credit.⁶

The unavailability of finance is also a key obstacle to firm dynamism, constraining profits and the expansion of productive capacity.⁷ In a study using data from 80 countries, the unavailability of finance, crime, and political instability were key obstacles to firm growth, finance being the most important, particularly for small firms.⁸ Aterido, Hallward-Drie-meier, and Pages found that small firms have less access to formal finance, face greater interruptions in infrastructure services as measured by the number of days firms remained without electric power

and the share of the average cargo's value lost while in transit, and pay more in bribes as a percentage of sales than larger firms.⁹ Beck and Demirguc-Kunt also found that small and medium firms have less access to formal source of finance.¹⁰

Using the ES panel data, which cover 18 African countries, this study quantifies the effects of business obstacles on firm survival and growth. When confronted with severe obstacles, firms decide either to continue or to cease operation. If they continue, they decide on the optimal size of their labor force. Recognizing this sequence in firm dynamism, this empirical strategy uses a two-part model to distinguish the impacts of obstacles, first on firm survival and then, conditioned on survival, on the growth of the firm's workforce. The ES survey, in a second wave, followed firms that were part of an initial survey to analyze their survival status and growth trajectory. The analysis controls for firm characteristics and for year and country-level characteristics.

FIRM PRODUCTIVITY AND JOB CREATION

Employment growth is closely related to firm survival and firm productivity. Studies on the determinants of firm survival have shown that labor productivity has a highly significant negative relationship with firm exit.¹¹ In "creative destruction," low-productivity firms are the ones more likely to cease operation, paving the way for more productive or more capable firms to replace them. Using the same World Bank ES data as this study, Aga and Francis estimated that the exiting firms account for loss of around 3 to 4.2 percent of private sector employment a year.¹² Their study is among the first to estimate the magnitude of job loss using comparable, cross-country data on a wide swath of developing countries. They also found that, among a host of characteristics, a firm's productivity and age matter the most for exit, both in an inverse relationship. They also identified "firm exit as it relates to barriers to entry"—whether structural barriers to firm creation also encourage firm dissolution—as needing more study. This study aims to fill that

gap by exploring the extent to which obstacles to doing business prevent firms from increasing employment and, therefore, increasing their productivity and chances of survival.

Other determinants have been found for firm survival and employment growth—not all limited to Sub-Saharan Africa or even to a developing country context. For example, in a survey of German firms, larger ones had a lower likelihood of exit, and young ones faced a higher likelihood. Younger firms were also more susceptible to obstacles common to all firms in a region, implying an increased vulnerability that dissipates with age and size.¹³ Another study found that the business and regulatory environment of a country influences both which firms survive and which surviving firms create jobs. It also recommended that the wider regulatory framework provide an efficient path to exit for firms that are no longer viable, though it is unclear whether this recommendation is relevant to less developed economies.¹⁴ In a similar developed economy context, regulations that served as barriers to entry also delayed growth in incumbent firms, but the authors of that study suggested that in developing economies, regulations would not keep the “cheats” out and so might pose an undue burden on new firms.¹⁵ Finally, during a macroeconomic crisis, productivity alone was not enough to determine which firms survived and which went out of business, and similarly, the correlation between productivity and employment growth did not strengthen during the East Asian financial crisis.¹⁶ These findings suggest that specific firm-level data will help explain firm survival and employment creation, since many characteristics, including the particular barriers firms face, are likely to play an important role.

In a specifically African context, Shiferaw analyzed firm-level survival for a sample of Ethiopian manufacturing firms, finding that industries with low entry barriers also had low exit rates, indicating that new entrants to an industry do not tend to challenge incumbents for their market power.¹⁷ It is unclear whether the findings are reproducible beyond Ethiopia. Similarly, in a study of Côte

d’Ivoire, a country with a particularly low World Bank Ease of Doing Business score, employment growth was inhibited by barriers to incumbent firm growth, rather than barriers to new firm entry.¹⁸ The barriers include “costly and timely procedures to obtain licenses, register property and collateral, and resolve disputes.” This study will record and estimate the impact of many of these obstacles explicitly, while controlling for other firm-level characteristics.

In addition to the empirical explorations, there have also been theoretical and conceptual models of firm survival and job creation. One models the “great variability” in firm-level outcomes, including entry and exit and firm-level job creation and destruction, and derives optimal policies for firms facing an uncertain business environment.¹⁹ The model is generalizable to a developing country context characterized by a loose regulatory framework and enhanced competition from the informal sector. Another study estimates parameters of a production function and then uses the estimates to analyze changes in firm-level productivity during a period marked by firm restructuring and widespread entry and exit.²⁰ A strong financial system is at the core of productive and efficient firm growth, creation, and destruction in an analysis of which financial system impediments most commonly affect Sub-Saharan firms, which firm characteristics mediate the impediments, and which impediments most hinder job creation.²¹

THE WORLD BANK ENTERPRISE SURVEY

This study uses data from the World Bank ES project, one of the most comprehensive firm-level surveys in emerging markets and developing economies. The survey covers small, medium, and large enterprises in the nonagricultural formal private sector. The ES is a repeated cross-section survey, with data regularly collected every 4 to 5 years through face-to-face interviews in which owners and managers of enterprises are asked about their perceptions of key constraints. The study covers

trade; finance; labor; infrastructure; innovation; regulations; taxes and business licensing; crime, informality, and corruption; and perceptions about obstacles to doing business.²²

ES panel data are available for almost 30,000 firms in 24 African countries (table 1). Before the full ES survey, a screening phase asks several questions on a firm's willingness to participate and its current operational status. The firm exit variable uses the information on survey eligibility of firms from the screening phase.²³ Firm status is categorized into four groups: (1) confirmed operational; (2) confirmed exit; (3) engaged in ineligible activities, which according to the ES questionnaire include major sectors such as education, agriculture,

finance, and government; and (4) incorrect address or no response. The analysis follows a strict definition of firm exit: a firm is considered to exit if it is confirmed as ceasing operation, is currently engaged in ineligible activities, or has incorrect contact information or is nonresponsive to verification requests. This analysis focuses on firms interviewed in at least two rounds and, in cases where there are three or more rounds, uses only the latest two. After these criteria are applied, the study has data from only 18 countries.

Firm survival

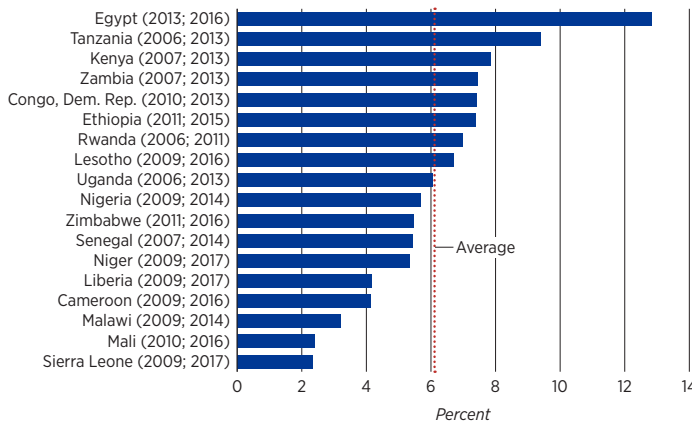
Of the 8,425 firms surveyed in wave 1, only 5,440 survived to the follow-up survey in wave 2. The

TABLE 1
The number of firms at risk, exited, and survived, by country

Country	Survey years	Whole sample (pooled)	At risk (wave 1)	Exit	Survived (wave 2)	Gap between waves (years)
Angola	2006, 2010	785	—	—	—	—
Benin	2009, 2016	300	—	—	—	—
Botswana	2006, 2010	610	—	—	—	—
Burkina Faso	2006, 2009	533	—	—	—	—
Cameroon	2009, 2016	724	363	105	258	7
Congo, Dem. Rep.	2010, 2013	857	359	80	279	3
Egypt	2013, 2016	4,724	1,372	528	844	3
Ethiopia	2011, 2015	1,492	644	190	454	4
Ghana	2007, 2013	1,213	—	—	—	—
Kenya	2007, 2013	1,409	657	310	347	6
Lesotho	2009, 2016	301	151	71	80	7
Liberia	2009, 2017	301	150	50	100	8
Malawi	2009, 2014	673	150	24	126	5
Mali	2010, 2016	545	360	52	308	6
Niger	2009, 2017	301	150	64	86	8
Nigeria	2009, 2014	5,833	1,136	322	814	5
Rwanda	2006, 2011	453	212	74	138	5
Senegal	2007, 2014	1,107	506	193	313	7
Sierra Leone	2009, 2017	302	150	28	122	8
South Africa	2003, 2007	1,660	—	—	—	—
Tanzania	2006, 2013	1,232	419	276	143	7
Uganda	2006, 2013	1,325	563	238	325	7
Zambia	2007, 2013	1,204	484	216	268	6
Zimbabwe	2011, 2016	1,199	599	164	435	8
Number of firms		29,083	8,425	2,985	5,440	5.94

Source: World Bank Enterprise Survey data.

FIGURE 1
Annual firm exit rates



Source: Authors' calculations using World Bank Enterprise Survey data.

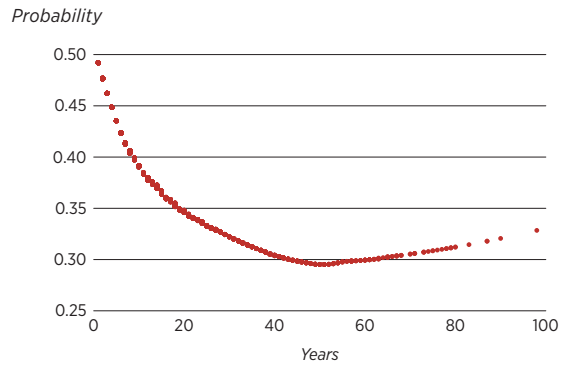
average time between the two waves was 5.94 years. The annual rate of exit is therefore about 6.1 percent, ranging from 2.3 percent and 2.4 percent in Sierra Leone and Mali to 12.8 percent in Egypt (figure 1). Although the annual rate of firm entry is hard to capture using the ES data, the distribution of firm ages provides some picture. While the modal age is 8 years since firms started operation, half the firms are younger than 12 years. Clearly, firm age and the probability of exit are inversely proportional, in that younger firms are more likely to exit than older ones (figure 2).

Employment growth

The average annual employment growth was 6.56 percent during the latest ES wave (figure 3).²⁴ There is however large variation across countries, with some performing well and others posting negative growth. For instance, in Sierra Leone, employment grew on average by 16 percent annually over the three year period between 2014 and 2017, whereas growth was negative in Zimbabwe, declining by 5 percent a year, and in Egypt, declining by 0.6 percent a year, between 2013 and 2016.

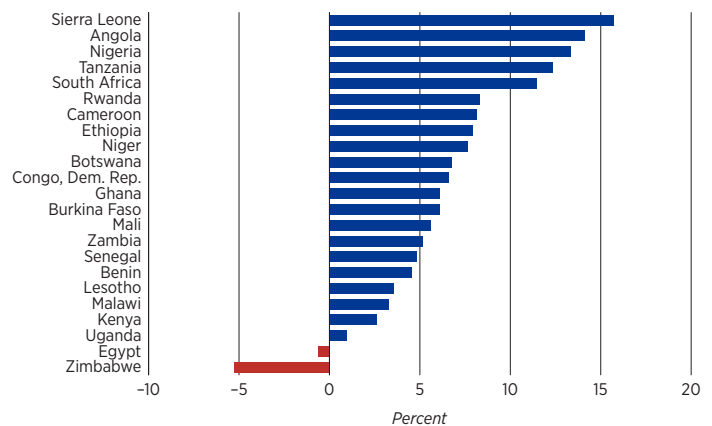
Firm survival and employment growth also depend on size. Empirical evidence from advanced countries shows that small manufacturing firms grow faster than larger firms. Similarly, firm survival generally increases with firm size, but

FIGURE 2
Probability of exit by firm age



Source: Authors' calculations using World Bank Enterprise Survey data.

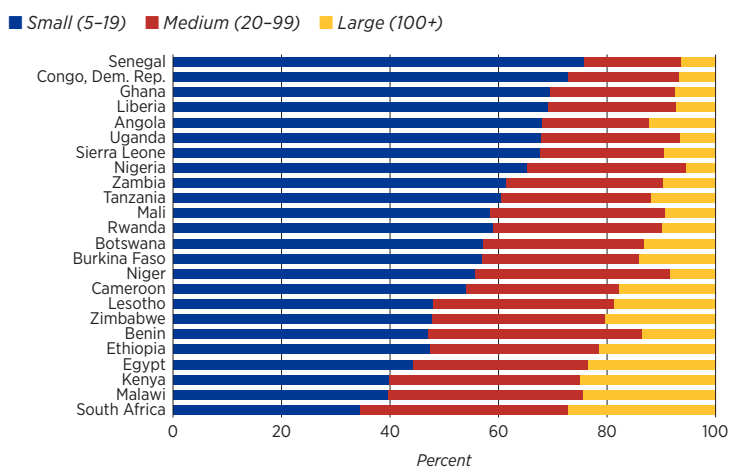
FIGURE 3
Annual employment growth, latest wave



Source: Authors' calculations using World Bank Enterprise Survey data.
Note: Employment growth is calculated using information on the reported number of employees at the end of the last fiscal year and by the end of the fiscal year three years ago:
$$growth = \frac{\log(\text{Workers last year}) - \log(\text{Workers 3 years ago})}{2}$$

employment growth conditional on survival decreases with size, partly due to diminishing returns to scale and the rate and direction of innovation. In the ES panel data for African countries, small enterprises hiring 5–19 workers predominate, accounting for 55 percent, followed by medium enterprises hiring 20–99 employees, with 28 percent, and large enterprises hiring more than 100, with 13 percent (figure 4). The distribution of firm size varies considerably across countries. In Senegal, small firms account for 75 percent of all the firms in the sample, whereas they account

FIGURE 4
Distribution of firm size



Source: Authors' calculations using World Bank Enterprise Survey data.

for only 34 percent in South Africa. Firm size also varies by sector. Firms in manufacturing tend to be larger, whereas firms in retail and other services tend to be smaller. In the pooled ES panel data, about 45.5 percent of the firms operate in manufacturing sector, with the rest in services.

Firm ownership structure affects firm dynamism. It determines management, worker effort, access to capital, productivity growth through innovation and research and development investment, and so on, which directly and indirectly affect firm survival and dynamism. About half of firms in the data are sole proprietorships, whereas about one-fifth are nontraded shareholder companies.

Good management practices, such as setting targets, monitoring achievement, and implementing appropriate incentive mechanisms have large positive effects on firm productivity. In the literature, such practices are strongly correlated with managerial human capital such as education and experience.²⁵ In the ES panel data, firms with university-educated managers are more likely to survive than firms with managers with lower levels of education.

In traditional theory, economic liberalization results in increased trade, improved efficiency,

accelerated technological change, and growth. Trade liberalization's long-run impact, through efficient allocation of resources, is increased welfare and more jobs, though the short-run impact could be a loss of jobs.²⁶ Labor-intensive export firms would generate more employment. In the ES data, firms that are direct exporters are more likely to survive than firms that are not direct exporters.

Major constraints on doing business

Firm survival and employment growth also depend on business constraints. In the ES survey, firms are asked, in a "list of elements of the business environment, can you tell me which one, if any, currently represents the biggest obstacle faced by this establishment." The list includes 15 obstacles that can be broadly categorized into six groups:

- Political environment (corruption, political instability, and crime, theft, and disorder).
- Business regulation (tax rates, access to land, trade registration, tax administration, and business licensing and permits).
- Infrastructure (transport, electricity, and telecommunications).
- Access to finance.
- Practice of competitors in the informal sector.
- Inadequately educated work force.

About 19 percent of firms listed limited access to finance as their biggest of the 15 obstacles (figure 5). The obstacle listed second most (18 percent) was limited access to electricity. Limited access to land followed with 13 percent, and political instability with 12 percent. Countries varied widely, with limited access to finance reported as the biggest obstacle by 45 percent of firms in Zimbabwe but only 0.5 percent in Tanzania. And sectors of operation vary. Limited access to finance was reported as the biggest obstacle by 18 percent of firms in manufacturing but 16 percent in retail and services. Similarly, limited access to land was reported as the biggest obstacle by 14 percent of the firms in services but only 6 percent in manufacturing.

TABLE 2
Firm characteristics by exit status

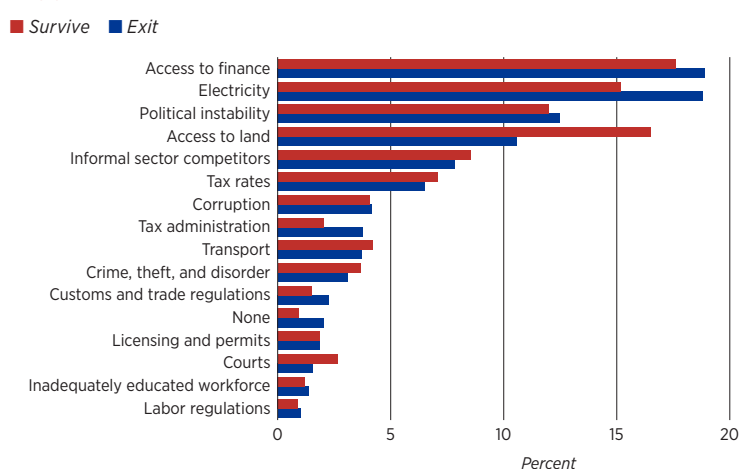
	Exit	Survive	Pooled
Annual employment growth, wave 1 (%)	—	—	6.5
Annual employment growth, wave 2 (%)	—	3.90	—
Age of firm (years)	14.32 (13.36)	17.66 (15.71)	16.47 (15.00)
Experience of top manager (years)	13.29 (9.667)	14.84 (10.38)	14.29 (10.16)
Female manger (%)	11.4	9.81	10.3
Internationally certified (%)	12.3	17.3	15.5
Top manager's education (%)			
Unknown	17.5	17.1	17.2
Primary	6.11	5.45	5.69
Secondary	10.5	7.65	8.69
University	55.2	60.3	58.5
Direct exporter (%)	8.14	9.96	9.32
Manufacturing (%)	43.6	50.2	47.9
Location (%)			
Capital city	30.3	20.5	24
City with 1 million plus people	24.1	34	30.5
City with 250,000-1 million people	14.6	17.7	16.6
City with 50,000-250,000 people	15.1	14.7	14.8
City with fewer than 50,000 people	2.61	2.68	2.66
Firm size (%)			
Micro (1-4 employees)	0.101	0.404	0.297
Small (5-19 employees)	59.6	50.9	54
Medium (20-99 employees)	21.6	29.7	26.8
Large (100+ employees)	7.77	15.6	12.8
Ownership structure (%)			
Shareholder (traded)	2.01	3.93	3.25
Shareholder (nontraded)	25.9	26	26
Sole proprietorship	52.2	50.1	50.9
Partnership	11.8	9.54	10.3
Limited partnership	6.5	7.7	7.28
Other	6.5	7.7	7.28
Number of firms	2,985	5,440	8,425

Source: Authors' calculations using World Bank Enterprise Survey data.

ECONOMETRIC ANALYSIS

This section models firm dynamism using a two-part model in which the firm first decides whether to continue or cease operation. Then, if it has decided to continue, the firm decides on whether

FIGURE 5
Biggest obstacle



Source: Authors' calculations using World Bank Enterprise Survey data.

to expand, reduce, or maintain the same number of workers. The analysis treats this sequential decision in a hurdle (two-part) model (see annex for details).

Effects of business obstacles on survival and employment growth

The effects of business obstacles on both survival and employment growth of firms conditioned on survival are all negative (table 3). When the analysis controls for year, country, location, and firm-level characteristics, the magnitude and statistical significance of some obstacles' effect on survival decreases, and the effects on employment growth in the surviving firms becomes statistically insignificant, though still negative for all obstacles. When all covariates are controlled for, courts seem to deliver the biggest blow to the survival of firms. Firms that reported courts as the biggest obstacle have about 0.17 percentage point lower probability of surviving. Limited access to finance also reduces the survival probability of firms by 0.14 percentage point compared with firms that did not report limited access to finance as the biggest obstacle.

Similarly, firms that reported tax rates; corruption; transport costs; limited access to land;

TABLE 3**Two-part estimation of the impacts of the biggest obstacles on employment growth**

	Specification (1)		Specification (2)		Specification (3)	
	Pr(Survive)	Growth Survived	Pr(Survive)	Growth Survived	Pr(Survive)	Growth Survived
Access to finance	-0.133*** (0.037)	-12.204*** (2.720)	-0.137*** (0.039)	-9.525*** (2.711)	-0.142*** (0.046)	-3.235 (2.915)
Access to land	-0.258*** (0.038)	-10.420*** (2.818)	-0.199*** (0.040)	-10.384*** (2.798)	-0.103** (0.049)	-1.890 (3.175)
Licensing and permits	-0.153*** (0.052)	-13.798*** (3.697)	-0.122** (0.054)	-13.344*** (3.687)	-0.055 (0.059)	-5.015 (3.836)
Corruption	-0.146*** (0.043)	-11.449*** (3.161)	-0.153*** (0.046)	-10.010*** (3.154)	-0.099* (0.052)	-3.912 (3.321)
Courts	-0.280*** (0.052)	-13.567*** (4.080)	-0.222*** (0.062)	-11.631** (4.616)	-0.174*** (0.067)	-4.550 (4.705)
Crime, theft, and disorder	-0.191*** (0.045)	-8.897*** (3.344)	-0.173*** (0.047)	-8.150** (3.332)	-0.094* (0.052)	-2.161 (3.431)
Customs, trade regulations	-0.061 (0.049)	-10.813*** (3.522)	-0.047 (0.051)	-9.071*** (3.450)	-0.024 (0.057)	-1.047 (3.597)
Electricity	-0.104*** (0.037)	-9.935*** (2.739)	-0.121*** (0.038)	-10.001*** (2.690)	-0.094** (0.047)	-3.696 (2.940)
Inadequately educated workforce	-0.123** (0.056)	-5.930 (4.002)	-0.138** (0.060)	-5.843 (3.983)	-0.088 (0.063)	1.600 (4.109)
Labor regulations	-0.121* (0.063)	-5.778 (4.417)	-0.104 (0.065)	-10.326** (4.379)	-0.075 (0.070)	-3.052 (4.496)
Political instability	-0.140*** (0.038)	-16.630*** (2.760)	-0.159*** (0.041)	-12.418*** (2.813)	-0.093* (0.049)	-3.993 (3.086)
Informal sector competitors	-0.170*** (0.039)	-12.421*** (2.907)	-0.171*** (0.042)	-8.748*** (2.933)	-0.115** (0.049)	-0.811 (3.160)
Tax administration	-0.025 (0.043)	-10.379*** (3.264)	-0.019 (0.045)	-9.886*** (3.196)	-0.030 (0.054)	-2.932 (3.434)
Tax rates	-0.170*** (0.040)	-11.618*** (2.969)	-0.161*** (0.042)	-10.704*** (2.925)	-0.092* (0.049)	-2.703 (3.144)
Transport	-0.180*** (0.044)	-4.882 (3.258)	-0.185*** (0.046)	-3.056 (3.224)	-0.120** (0.053)	5.132 (3.453)
Observations	8,287	3,151	7,241	2,681	7,241	2,681
R-squared		0.022		0.035		0.073
Firm characteristics	—	—	✓	✓	✓	✓
Year and country dummies	—	—	—	—	✓	✓

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are in parentheses.

Source: Authors' calculations using World Bank Enterprise Survey data.

Note: Specification (1) does not include any control. Specification (2) controls for firm size, firm age, firm age squared, export status, ownership structure, dummy for sector of operation, gender of the top manager, education of the top manager, experience of the top manager in years, and the type and population size of the city in which the firm is located. Specification (3) further controls for year and country-level characteristics by including year and country dummies.

political instability; crime, theft, and disorder; limited access to electricity; or competition from illegal/informal operators as their biggest obstacle have significantly lower survival rates, reduced by 0.09–0.125 percentage point.

When conditioned on survival, however, these factors do not have significant effects on firm employment growth. So, the main channel of impacts on firm dynamism is through the very survival of

firms. The surviving firms, after controlling for age, seem to manage well despite facing the obstacles they reported. These expected results are in line with findings in the literature that surviving or older firms are better positioned to withstand the effects of obstacles than are younger firms.

The ES survey also asked about a set of objective business obstacles. Among them, the effects of wave 1 power outages on wave 2 firm survival

and employment growth are not significant (table 4). But the percentage of time spent in dealing with regulations and the percentage of annual sales paid as bribes have significant impacts on the probability of firm survival. Surprisingly, the more time top managers spend on government regulations, the higher the probability of survival—specifically, when management time spent on dealing with government regulations increases by 1 percent, survival probability increases by 0.001 percentage point. Corruption significantly reduces firms’ survival probability. A 1 percent increase in informal payments as a share of sales reduces survival probability by 0.003 percentage point. No significant impacts on employment growth at surviving firms appear for any of these factors.

Size of effects on employment growth

Of the 15 biggest constraints discussed above, 10 had negative and statistically significant impacts on employment growth, mainly through their detrimental impact on the very survival of firms. The loss in annual employment growth due to the particular type of obstacle varies (table 5).²⁷ On average, court cases lead to a 0.34 percentage point decline in annual employment growth. To put that

TABLE 5
Predicted decline in annual employment growth due to a specific obstacle

Obstacle	Percentage points	Standard deviation
Licensing and permits	-0.36	(0.16)
Courts	-0.34 ^a	(0.16)
Political instability	-0.32 ^a	(0.15)
Corruption	-0.30 ^a	(0.13)
Electricity	-0.29 ^a	(0.13)
Access to finance	-0.28 ^a	(0.13)
Labor regulations	-0.24	(0.10)
Tax rates	-0.22 ^a	(0.10)
Tax administration	-0.21	(0.09)
Access to land	-0.18 ^a	(0.08)
Crime, theft, and disorder	-0.17 ^a	(0.09)
Informal sector competitors	-0.12 ^a	(0.08)
Customs and trade regulations	-0.10	(0.05)
Inadequately educated workforce	0.04	(0.07)
Transport	0.19 ^a	(0.15)

a. Estimated coefficient is statistically significant.
Source: Authors’ calculations using World Bank Enterprise Survey data.

figure in perspective, imagine a typical firm with employment growing 5 percent a year. These back-of-the-envelope estimates imply that a new court case, keeping all other factors constant, reduces annual employment growth to only 4.66 percent.

TABLE 4
Two-part estimation of the impacts of objective obstacles

	Pr (Survive)	Growth Survived	Pr (Survive)	Growth Survived	Pr (Survive)	Growth Survived	Pr (Survive)	Growth Survived	Pr (Survive)	Growth Survived
Number of power outages	0.001 0.000	-0.025 (0.025)								
Duration of power outages			-0.001 (0.001)	0.002 (0.071)						
Percent of loss due to power outages					0.000 (0.001)	-0.023 (0.037)				
Percent of management time spent on government regulation							0.001** 0.000	-0.042 (0.027)		
Share of sales used to bribe officials									-0.003*** (0.001)	0.060 (0.083)
Observations	7,372	2,722	7,372	2,722	7,372	2,722	7,372	2,722	7,372	2,722
R-squared		0.066		0.066		0.066		0.066		0.066
Firm characteristics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year and country dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are in parentheses.
Source: Authors’ calculations using World Bank Enterprise Survey data.

Similarly, the political environment, particularly political instability, corruption, and crime, theft, and disorder, lead to a reduction in annual employment growth by 0.17 to 0.32 percentage point. Moreover, obstacles such as tax rates and limited access to land, finance, and electricity significantly reduce annual employment growth.

CONCLUSION

Africa's jobs challenge is enormous. The buoyant economic growth that the continent enjoyed in the past decade and a half has not yielded enough high-productivity jobs. Most people are stuck in agriculture. And nonagricultural employment continues to be dominated by the informal sector, where wages are low and benefits nonexistent. With major demographic change expected to bring pressure on African labor markets, the urgency to create high-quality remunerative jobs at a much faster pace is not only an economic issue but a political and social one, as well. This study investigated how failure to remove business obstacles hampers job growth in the formal private sector. Using the World Bank Enterprise Survey (ES) panel data in a two-part model, the study quantified the percentage of jobs lost due to the impact of business obstacles on firm survival and employment growth.

The analysis found that such business obstacles as limited access to finance, competitors in the informal sector, an inadequately educated work force, business regulation (tax rates, limited access to land), infrastructure (transportation and electricity), and the political environment (corruption, political instability, and crime, theft, and disorder) significantly reduced formal private sector employment growth. A single reported business obstacle reduced annual growth by 0.1–0.34 percentage point.

By removing key business obstacles, African policymakers could not only increase new job creation but also save existing jobs from disappearing. Several reported obstacles could be removed or mitigated if the right institutions and infrastructure are put in place.

NOTES

1. Bakhtiari 2017; Clementi and Palazzo 2016; Schoar 2010; Aga and Francis 2015.
2. Hathaway and Litan 2014.
3. Botero et al. 2004; Heckman and Pages 2004.
4. Aterido, Hallward-Driemeier, and Pages 2011; Seker and Correa 2010.
5. Pages and Micco 2006; Mondino and Montoya 2004.
6. Cull and Xu 2005.
7. Karlan and Valdivia 2011.
8. Ayyagari, Beck, and Demirguc-Kunt 2007; Beck and Demirguc-Kunt 2006; Galindo and Micco 2007.
9. Aterido, Hallward-Driemeier, and Pages 2011.
10. Beck and Demirguc-Kunt 2006.
11. Aga and Francis 2015.
12. Aga and Francis 2015.
13. Fackler, Schnabel, and Wagner 2013.
14. Cirmizi, Klapper, and Uttamchandani 2011.
15. Klapper, Laeven, and Rajan 2006.
16. Hallward-Driemeier and Rijkers 2013.
17. Shiferaw 2009. Given the data the author had access to, he could only use proxies for entry and exit barriers and other obstacles, rather than directly including them in the estimation. This study builds on the author's work through direct measurement and inclusion of a variety of business obstacles, from data on a variety of African countries.
18. Klapper and Richmond 2011.
19. Ericson and Pakes 1995.
20. Olley and Pakes 1992.
21. Levine 2005.
22. More information is available online at the World Bank ES project at www.enterprisesurveys.org.
23. This approach follows Aga and Francis 2015.
24. We calculate a growth rate on the number of employees at the end of the last fiscal year and at the end of 3 fiscal years ago.

$$\text{Annual growth} = \frac{\log(\text{Workers last year}) - \log(\text{Workers 3 years ago})}{2}$$

25. Queiro 2016.

26. Ernst 2005.

27. Assuming that reported obstacles are exogenous, we calculate the total effect of the k th obstacle on employment growth, keeping all other factors constant, as:

$$\frac{\partial E(g|\mathbf{X}, \hat{\Gamma})}{\partial Obs^k} = \{E(g|\mathbf{X}, \hat{\Gamma}, Obs^k = 1) - E(g|\mathbf{X}, \hat{\Gamma}, Obs^k = 0)\} \quad (4)$$

where $\hat{\Gamma} = [\hat{\beta}, \hat{\gamma}, \hat{\delta}, \hat{\theta}]$ is a vector of estimated coefficients and $E(g|\mathbf{X}, \hat{\Gamma}, Obs^k = 1)$ and $E(g|\mathbf{X}, \hat{\Gamma}, Obs^k = 0)$

are calculated by, respectively, switching the k th obstacle on and off. The predicted survival probabilities and employment growth are annualized by adjusting for the number of years elapsed between waves.

REFERENCES

- Aga, G., and D. Francis. 2015. "As the Market Churns: Estimates of Firm Exit and Job Loss Using the World Bank's Enterprise Surveys." World Bank Policy Research Working Paper No. 7218. Washington, DC.
- Aterido, R., M. Hallward-Driemeier, and C. Pagés. 2011. "Big Constraints to Small Firms' Growth? Business Environment and Employment Growth Across Firms." *Economic Development and Cultural Change* 59 (3): 609–647.
- Ayyagari, M., T. Beck, and A. Demircug-Kunt. 2007. "Small and Medium Enterprises across the Globe." *Small Business Economics* 29 (4): 415–434.
- Bakhtiari, S. 2017. *Entrepreneurship Dynamics in Australia: Lessons from Micro-Data*. Amsterdam, Netherlands: Elsevier. Available at: SSRN: <https://ssrn.com/abstract=2940093> or <http://dx.doi.org/10.2139/ssrn.2940093>.
- Beck, T., and A. Demircug-Kunt. 2006. "Small and Medium-size Enterprises: Access to Finance as a Growth Constraint." *Journal of Banking & Finance* 30 (11): 2931–2943.
- Botero, J.C., S. Djankov, R.L. Porta, F. Lopez-de-Silanes, and A. Shleifer. 2004. "The Regulation of Labor." *The Quarterly Journal of Economics* 119 (4): 1339–1382.
- Clementi, G.L., and B. Palazzo. 2016. "Entry, Exit, Firm Dynamics, and Aggregate Fluctuations." *American Economic Journal: Macroeconomics* 8 (3): 1–41.
- Cirmizi, E., L. Klapper, and M. Uttamchandani. 2011. "The Challenges of Bankruptcy Reform." *The World Bank Research Observer* 27 (2): 185–203.
- Cull, R., and L.C. Xu. 2005. "Institutions, Ownership, and Finance: The Determinants of Profit Reinvestment among Chinese Firms." *Journal of Financial Economics* 77 (1): 117–146.
- Ericson, R., and A. Pakes. 1995. "Markov-perfect Industry Dynamics: a Framework for Empirical Work." *The Review of Economic Studies* 62 (1): 53–82.
- Ernst, C. 2005. "Trade Liberalization, Export Orientation and Employment in Argentina, Brazil, and Mexico." ILO Employment Strategy Paper 2005/15. Geneva, Switzerland.
- Fackler, D., C. Schnabel, and J. Wagner. 2013. "Establishment Exits in Germany: The Role of Size and Age." *Small Business Economics* 41 (3): 683–700.
- Galindo, A.J., and A. Micco. 2007. "Creditor Protection and Credit Response to Shocks." *The World Bank Economic Review* 21 (3): 413–438.
- Hall, B.H. 1986. "The Relationship between Firm Size and Firm Growth in the US Manufacturing Sector." NBER Working Paper No. 1956. Cambridge, MA.
- Hallward-Driemeier, M., and B. Rijkers. 2013. "Do Crises Catalyze Creative Destruction? Firm-level Evidence from Indonesia." *Review of Economics and Statistics* 95 (1): 1788–1810.
- Hathaway, I., and R.E. Litan. 2014. "Declining Business Dynamism in the United States: A Look at States and Metros." Washington, DC: Brookings Institution.
- Heckman, J.J., and C. Pagés. 2004. "Law and Employment: Introduction." In *Law and Employment: Lessons from Latin America and the Caribbean*, ed. J.J. Heckman and C. Pagés. Chicago, IL: University of Chicago Press.
- Karlan, D., and M. Valdivia. 2011. "Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions." *Review of Economics and Statistics* 93 (2): 510–527.
- Klapper, L., L. Laeven, and R. Rajan. 2006. "Entry Regulation as a Barrier to Entrepreneurship." *Journal of Financial Economics* 82 (3): 591–629.
- Klapper, L., and C. Richmond. 2011. "Patterns of Business Creation, Survival and Growth: Evidence from Africa." *Labour Economics* 18 (1): S32–S44.
- Levine, R. 2005. "Finance and Growth: Theory and Evidence." *Handbook of Economic Growth* 1 (1): 865–934.
- Mondino, G., and S. Montoya. 2004. "The Effects of Labor Market Regulations on Employment Decisions by Firms: Empirical Evidence for Argentina." In *Law and Employment: Lessons from Latin America and the Caribbean*, ed. J.J. Heckman and C. Pagés. Chicago, IL: University of Chicago Press.

- 
- Olley, G.S., and A. Pakes. 1992. “The Dynamics of Productivity in the Telecommunications Equipment Industry.” National Bureau of Economic Research Technical Report. Cambridge, MA.
- Pages, C., and A. Micco. 2006. “The Economic Effects of Employment Protection Laws.” IZA/World Bank Conference on Employment and Development.
- Queiro, F. 2016. “The Effect of Manager Education on Firm Growth.” Harvard University Working Paper. Cambridge, MA.
- Reinecke, G., and S. White. 2004. *Policies for Small Enterprises: Creating the Right Environment for Good Jobs*. Geneva, Switzerland: International Labour Organization (ILO).
- Schoar, A. 2010. “The Divide between Subsistence and Transformational Entrepreneurship.” *Innovation Policy and the Economy* 10 (1): 57–81.
- Seker, M., and P.G. Correa. 2010. “Obstacles to Growth for Small and Medium Enterprises in Turkey.” Policy Research Working Paper WPS5323, World Bank, Washington, DC.
- Shiferaw, A. 2009. “Survival of Private Sector Manufacturing Establishments in Africa: the Role of Productivity and Ownership.” *World Development* 37 (3): 572–584.

ANNEX

To model firm dynamism, the analysis uses a two-part model in which the firm first decides whether to continue or cease operation. Then, if it decides to continue, the firm decides whether to expand, reduce, or maintain the same number of workers. The analysis treats this sequential decision in a hurdle (two-part) model. It estimates the roles of obstacles in overall firm dynamism given by:

$$E(g|X) = P(s = 1|X) \times E(g|X, s = 1), -\infty < g < \infty \quad (1)$$

where $-\infty < g < \infty$ is employment growth of the firm, s is a dummy variable indicating whether the firm continued or ceased operation, $E(\cdot)$ is the expectation operator, and X is a vector of covariates. The first part of the RHS of equation (1) is the probability of firm survival, and the second part is firm employment growth conditional on survival. There are several approaches to estimate equation (1). This study estimates firm survival using logit model as:

$$P(s_i = 1|X_i, \beta, \gamma) = \frac{1}{1 + \exp(-\beta \mathbf{Obs}_i - \gamma X_i)}, i = 1, \dots, N \quad (2)$$


where \mathbf{Obs}_i is a vector of dummy variables indicating whether the k th obstacle is reported as the biggest obstacle and X_i is as defined above but also includes a vector of ones, and $\beta = [\beta_1, \dots, \beta_k]'$ and γ are vectors of coefficients to be estimated. Likewise, we estimate the linear part of the hurdle model using simple OLS as:

$$g_i = \delta \mathbf{Obs}_i + \theta W_i + \varepsilon_i, i = 1, \dots, n_1 \quad (3)$$

where $n_1 \in N$ is the number of surviving firms, W_i is a vector of covariates, δ and θ are vectors of parameters to be estimated, and ε_i is random i.i.d error term. Then, the expected employment growth can be obtained from the predicted probabilities given in equation (2), and the predicted employment growth conditional on survival given in equation (3).

THE “MISSING WOMEN” IN AFRICAN LABOR MARKETS

Andinet Woldemichael, African Development Bank

 @a_woldemichael

In his 1990 and 1992 studies, the Nobel Laureate Amartya Sen showed that in some parts of the world—particularly in India and China—the ratio of women to men is conspicuously low. He estimated that about 100 million women were missing worldwide. He argued that discrimination and relative neglect of girls resulted in excess mortality among women. He epitomized these findings by coining the term “missing women.”

In Africa, where the gender gaps in work, earnings, productivity, assets, agency, etcetera lingers, Sen’s missing women notion is relevant today. Africa has a fairly active labor force. In 2018, the total labor force—population above the age of 15—was 481.6 million. While women constitute half of the population, they account for 43 percent (or 205.6 million) of the labor force, slightly higher than the world average of 40 percent. Not every person in the labor force participates in the labor market, either by not working or not actively seeking employment. In addition to the lack of employment opportunities and the demand for income, working-age individuals can become economically inactive because of marriage, fertility, disability, or chronic illness. Culture, religion, and social norms also matter for the inclusion or exclusion of individuals in the labor market, based on their race, religion, caste, and sex. In many parts of the

world, these factors conspire predominantly against women, disenfranchising them from the labor market.

About three-fourths of working-age men (76 percent)—both in the world and in Africa—actively participate in the labor market. But female labor force participation rates are 56 percent in Africa and 50 percent in the world. The difference between women’s and men’s participation rates then are 20 points in Africa and 26 points globally. African women are thus more active in the labor market compared with the world average. These continental figures mask variation across countries, ranging from 17 percent participation in Algeria to 86 percent in Rwanda. And at 24 percent, North Africa has one of the world’s lowest female rates.

Women’s low participation costs countries a lot in potential economic development. The International Monetary Fund found that reducing the gender gap in labor force participation to the average for emerging markets and developing economies in the Middle East and North Africa would have doubled their GDP growth over the past decade, with a cumulative output gain of US\$1 trillion (Purfield et al. 2018). Women’s low participation in the labor market is thus a question not just of fairness but of considerable economic importance.

Determining how many women are missing

What would be the number of women in the labor market—the counterfactual—if female and male participation rates had been on par with high-income advanced countries in Europe and North America (the reference group)?

In 2018, the average female and male participation rates in the reference countries were 52 and 74 percent, respectively. Since the average rates for Africa are respectively 56 and 76 percent, above the reference rates, we would expect “excess women” in the aggregate labor market. Our interest, however, goes beyond estimating the continental counterfactual in the African labor market if participation rates were the same as in reference countries. We also estimate the counterfactuals for different African countries and highlight the heterogeneity for each age group.

Following Anderson and Ray (2010), for each age group a , let $d^m(a)$ and $d^w(a)$ represent the rates of nonparticipation for men and women. Similarly, let the average rates of nonparticipation for men and women in our reference countries be denoted by $\hat{d}^m(a)$ and $\hat{d}^w(a)$, respectively. Then the reference rate for women, denoted by $r^w(a)$, which equalizes the relative gender-specific labor force

non-participation rates for each country to the reference countries, is given by

$$r^w(a) = \frac{d^m(a) \times \hat{d}^w(a)}{\hat{d}^m(a)} \quad (1)$$

Then, the number of age-specific extra female non-participants (EFN) is given by

$$EFN(a) = [d^w(a) - r^w(a)]n^w(a) \quad (2)$$

which is the difference between the actual and reference relative non-participation rates for women, weighted by the number of women ($n^w(a)$) in the corresponding age group. $EFN(a)$ could be negative if a country has higher non-participation rate for women relative to the reference countries' average, or positive if a county has lower nonparticipation rate for women relative to the reference countries' average.

The number of missing women

Of 49 countries in the analysis, 19 have a combined 44 million missing women. North African countries stand out, with about 28 million missing women in the labor market across all age groups of 15–64 years. About 15.7 million Egyptian working-age women are missing, taking the average rate of advanced countries in Europe and North America as the benchmark (table 1). Similarly, about 6 million Algerian, 5 million Mauritanian, 1.3 million Tunisian, and 151,000 Moroccan working-age women are missing from the labor market.

Women's labor market participation rate in many African countries is higher than in the reference countries. For instance, there are 13.8 million excess women in

TABLE 1

Estimated number of missing women in African labor markets, 2018

	Age group						
	15+	15-24	25-34	35-44	45-54	55-64	65+
Egypt	15,710	894	4,452	3,854	2,322	657	-22
Algeria	5,974	477	1,463	1,434	996	-108	-179
Mauritania	4,903	501	1,403	1,300	573	117	-4
Tunisia	1,271	38	202	396	352	-16	-14
Morocco	151	-26	-56	-7	15	20	26
Ethiopia	1,401	-36	20	239	289	357	509
Nigeria	-13,800	-2,749	-8,134	-4,322	-1,555	-284	353
Africa	-7,252	-7,533	-8,187	481	2,333	716	1,652

Source: Author's computation using ILOSTAT.

the Nigerian labor market. Similarly, about 30 of 49 African countries have a total of 51.3 million excess women in the labor market. Overall, Africa would have 7.3 million excess women in its labor market, if male and female labor force participation rates had been equal to the average rates in the reference countries. What is striking for the continent is that the number of excess women is fully accounted by women in the age group of 15–34 at 15.7 million, with about 5.2 million missing women in the age bracket of 35 and above.

The results paint a picture of how women can be excluded from economic opportunities to fulfill expected social, marital, fertility, and other family commitments. Many women are still forced to exit the labor market due to having children, and in the absence of services such as child daycare, they have to care for their children after childbearing. Women are also responsible for domestic chores, including cooking, cleaning, collecting wood, and providing care for elderly parents, which are nonmarket activities outside the labor market.

If countries with higher participation rates for women and those with lower rates match the reference countries, Africa stands to gain an additional 44 million women actively participating in its labor markets. The gains range from an additional 1 percent of the current women labor force in Senegal to a whopping 213 percent in Egypt and 238 percent in Algeria.

Figure 1 shows the cartograms of actual (left panel) and counterfactual (right panel) female labor force. The geometry is distorted according to the size of the labor force, providing nice visual information. The counterfactual female labor force, particularly in North Africa, is much higher when the participation rates for women are on par with the reference countries.

A simple estimation of potential GDP gains from higher female participation

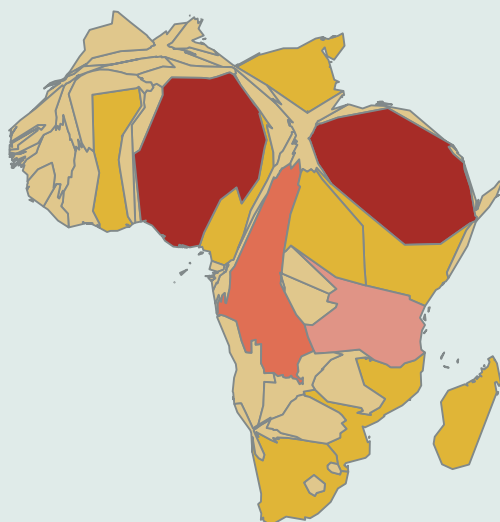
We applied a very simple approach to estimate the gains in GDP if the missing women were brought back to the labor

FIGURE 1
Africa's actual and counterfactual female labor force, 2018

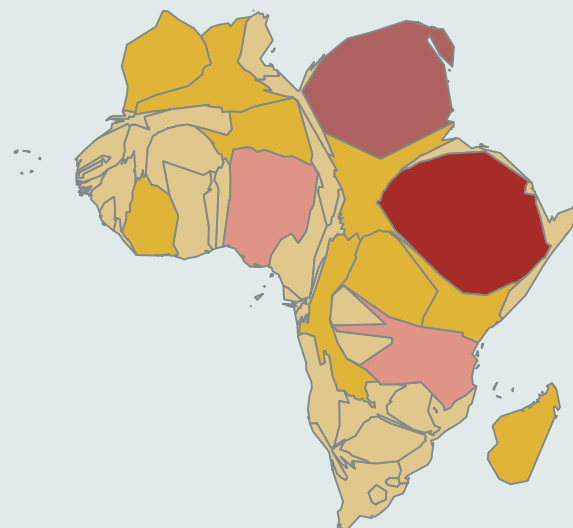
Labor force (millions)

0-5 5-10 10-15 15-20 20-25 25-30

Actual



Counterfactual



Note: The size of each country is proportional to the size of its female labor force rather than its area. Therefore, countries with larger female labor forces appear larger relative to the standard Africa map. The left panel shows actual female labor force data for 2018. The right panel shows the counterfactual female labor force data for 2018.

Source: Author's calculations using World Development Indicators and ILOSTAT data.

market. We estimated the potential gain in GDP for two scenarios. In one scenario we consider a situation where all African countries readjust the participation rates of women and men to rates equivalent to the reference countries. We then estimate the potential gains or losses from the readjustment of labor market participation by gender. In a second scenario, we readjust the labor force participation rates for only countries with currently missing women problem (19 countries) and make no readjustment for countries with excess women (30 countries).

Several simplifying assumptions are in order. Assume first that the current GDP per worker remains constant regardless of the readjustment in both labor force participation rates and relative

male–female rates. The simplistic approach also implicitly presumes that workers have the same productivity regardless of the sector of employment and their gender. Also keep the current level of unemployment constant for both men and women and assume that there is enough work for the additional women in the labor market. There also are several channels for increasing the participation rate of women and or reshuffling of the workforce along gender lines that could affect aggregate output and welfare. But for the sake of this simple exercise, assume away all these factors. We then use GDP data from the World Bank World Development Indicator (WDI) and employment data from the ILOSTAT, and estimate the potential gains and losses for 2017. GDP values are in US\$ in 2011

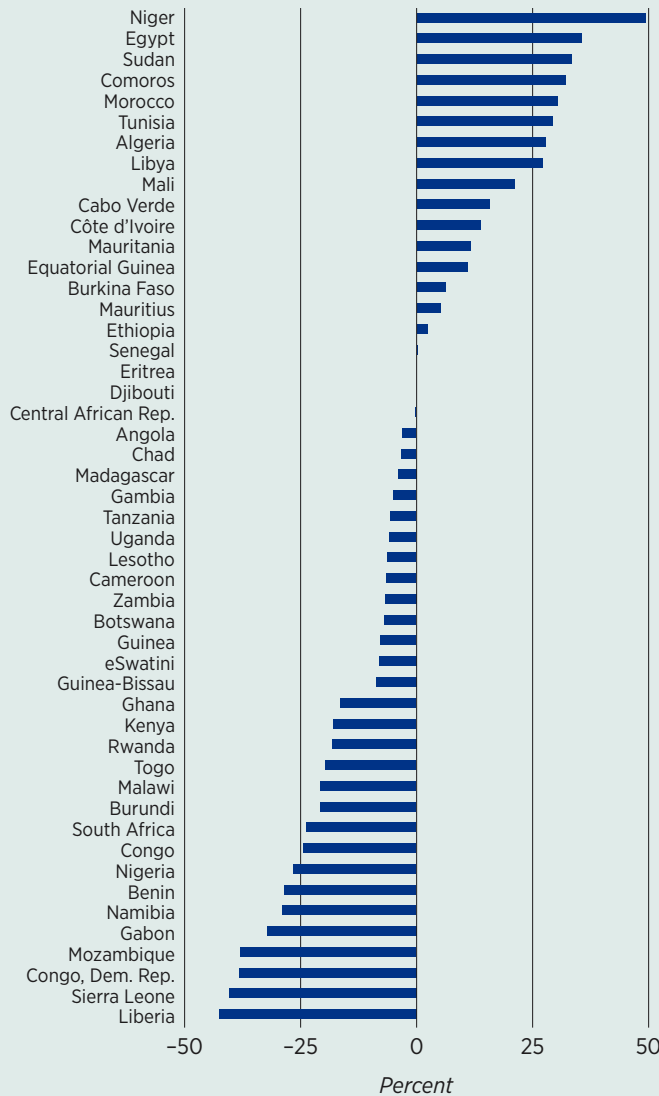
prices and adjusted for purchasing power parities (ppp). Two countries, Djibouti and Eritrea, dropped out from the estimation due to missing data.

This simple calculation shows huge potential gains from increasing women's labor market participation in countries with missing women. The positive gains in GDP range from less than 1 percent in Senegal to 50 percent in Niger (figure 2). Not surprisingly, North African countries—Egypt, Sudan, Morocco, Tunisia, Algeria, and Libya—would have a 27 to 36 percent higher GDP if women's and men's participation rates were equal to the relative rates in the reference countries.

If all African countries readjusted their relative women's and men's participation

FIGURE 2

Potential gains and losses in GDP from women’s labor market participation, 2017



Source: Author’s calculations using World Development Indicators and ILOSTAT data.

rates, as in scenario one, to the level of the reference countries, Africa’s GDP would have increased by 6.7 percent from the current level or by US\$384 billion (in 2011 prices, ppp). If countries with missing women readjust their participation rates to the average rates of developed countries in Europe and

North America, and countries with excess women maintain their current rates, Africa would gain as much as US\$ 924 billion in GDP (in 2011 prices, ppp), or about 16 percent of current GDP. Almost half the potential gain is accounted for by Egypt, which would have an additional US\$ 441 billion in GDP. So,

while women are more active in Africa in general, a large number of women are shunted from the labor market in many African countries—notably, in North Africa. This costs countries significant potential GDP gains.

Although women’s labor market participation in the majority of African countries is commendable, the continent lags behind the world in many other dimensions. Gender disparities in quality of employment (formal or informal), wages, productivity, rights, and so on are large and widespread. So, as much as gender-inclusive labor market policies should aim to remove barriers to achieve full participation of women, equal emphasis should be given to narrowing the disparities in several other dimensions of employment and rights.

References

Anderson, S., and D. Ray. 2010. “Missing Women: Age and Disease.” *Review of Economic Studies* 77(4), 1262–1300.

Anderson, S., and D. Ray. 2015. “Missing unmarried women.” *Journal of the European Economic Association*.

Purfield, M., M. H. Finger, M. K. Ongley, M. B. Naduel, C. Castellanos, M. G. Pierre, and M. E. Roos. 2018. *Opportunity for all: promoting growth and inclusiveness in the Middle East and North Africa*. Washington, DC: International Monetary Fund.

Sen, A. 1990. “More than 100 million women are missing.” *New York Review of Books*, 37 (20).

Sen, A. 1992. “Missing women.” *British Medical Journal*, 304, 587–588.



LABOR MARKET FLEXIBILITY AND JOBS IN FOUR AFRICAN COUNTRIES

Andinet Woldemichael, African Development Bank

 @a_woldemichael

Margaret Jodlowski, Cornell University

and **Abebe Shimeles**, African Development Bank


A flexible labor market is a precondition for fast and efficient structural transformation—the reallocation of labor from low- to high-productivity jobs. This study uses individual-level data that span more than 15 years to analyze labor market flexibility in four of Africa’s biggest or fastest-growing economies—Egypt, Ethiopia, Nigeria, and South Africa. The study uses standard labor market mobility matrices and the Shorrocks mobility index. In addition, it estimates a dynamic random effects of participation rate and examines transitions between unemployment and employment, self-employment and wage-salary employment, and agricultural and nonagricultural sectors. While two Sub-Saharan countries—Ethiopia and Nigeria—have relatively flexible labor markets—primarily due to the prevalence of the informal and agricultural sectors with low barriers to entry—Egypt and South Africa present relatively rigid mobility across labor market statuses. Roughly half the observed rigidity in entering the labor market in Egypt, Nigeria, and South Africa can be explained by worker characteristics such as age, gender, and education, whereas the other half is mainly due to institutional barriers and the lack of high-quality jobs. Although a normative assessment of the informal sector is difficult, its ability to absorb excess labor from an improperly functioning formal sector stands out. Thus, the informal sector is to be outgrown, not ignored.

INTRODUCTION

Africa enjoyed relatively fast economic growth over the past decade and a half. The sustained growth undoubtedly kindled hopes for a prosperous Africa. However, poverty and inequality remained pervasive. In 2013, poverty was still widespread, and the rate was high in Sub-Saharan Africa—41 percent, compared with the world average of just 10.7 percent and the South Asian average of 15 percent.¹ Moreover, the benefits of growth were not shared widely, and inequality was widespread and persistent. The median Gini coefficient measuring inequality in Africa was 0.36

in 2014, and 7 percent of total income goes to the bottom 20 percent of the income distribution.

High and persistent poverty and inequality are closely related to the structure of African economies and the type of jobs they provide. The past decade’s economic growth went largely without creating enough jobs to meet the growing labor force that seeks jobs or structural transformation.² Throughout the period, an additional 1 percentage point in gross domestic product (GDP) growth produced less than a 0.4 percentage point increase in total employment, even in the fastest-growing economies.³ Evidence seems to indicate



that Africa is heading toward a structural transformation turning point as urban population growth outpaces rural population growth.⁴ The changing demographics have been accompanied by changing employment from agricultural to nonagricultural sectors, particularly to services. But much of the labor force is still concentrated in the low-productivity, low-pay agricultural sector.

The lack of “good” jobs has far-reaching consequences for the political and social fabric of the continent. The lack of employment opportunities, especially for the growing youth population, was one of the leading causes of the Arab Spring in Tunisia, Libya, and Egypt.⁵ Moreover, the lack of desirable jobs in Sub-Saharan Africa, coupled with other socioeconomic and political stressors, has been the primary factor pushing a growing number of young Africans to embark on the perilous journey to Europe and other developed countries in search of a better life.

Africa faces complex employment problems. Workers struggle to find high-quality remunerative jobs in the formal sector, which accounts for only 15 percent of the labor force, including contract wage employment.⁶ Most formal sector employers are in small and medium enterprises with fewer than 250 workers (which globally account for up to 80 percent of employment in the formal sector). Productivity is typically higher in the formal nonagricultural sectors, but it largely depends on firm size.⁷ Consequently, wage differentials between enterprises of different sizes persist.

Faced with limited wage-paying formal jobs, Africans in the nonagricultural sectors are often forced to create their own informal jobs—unincorporated businesses mostly operated by household enterprises and unpaid family members. The informal sector accounts for up to 80 percent of nonfarm employment, and some scholars argue that “informal is normal” in Sub-Saharan Africa, providing employment and income for people who would otherwise be unemployed.⁸ However, informal jobs have low wages, benefits, and job security and are often associated

with poverty. Nearly 82 percent of African workers, mainly concentrated in the informal sector, are considered working poor, compared with the world average of 39 percent.⁹

Persistent inequality throughout the developing world can be explained, at least in part, by the prevalence of the informal economy. In a sample of 16 transition economies, Rosser and coauthors found a strong correlation between a country’s level of income inequality and the share of its economy that is informal.¹⁰

Furthermore, workers in the informal sector are vulnerable to violations of basic worker rights. They are not protected from various health and workplace risks or from loss of earnings. At the governmental level, concentrated informal sector employment diminishes tax revenue.¹¹ Consequently, much of the literature views widespread informal employment as a deterrent to economic growth and competitiveness, since informal enterprises tend to stay small, have lower access to inputs, and are ineffective in formal business relationships.¹² The lower productivity in informal sectors accounts in part for Africa’s failure to realize economic gains from workers moving out of agriculture: they are moving from one low-productivity sector to another, rather than to a highly productive industry or service sector.¹³

Today’s advanced economies show that the countries that pulled their populations out of poverty were those that experienced structural transformation, creating high-quality employment opportunities through which the poor worked their way out of hardship. For Africa, the lack of enough good jobs in the formal sector and the concentration of employment in the informal sector present significant development challenges. Workers are not moving from farms to modern jobs despite the large and persistent productivity gap between nonagricultural and agricultural sectors: in services, labor productivity is 1.7 times higher than economy-wide labor productivity, and in industry, 2.7 times higher. With such productivity differentials, labor should have moved much faster than it has.

A strand of the literature argues that the slow movement of workers from low-productivity to high-productivity sectors is partly due to an inefficient allocation of labor across sectors that result from a range of distortions.¹⁴ Efficient movement of labor requires functioning and competitive factor and product markets, in which price signals transmit without distortion.¹⁵ Only when such conditions are satisfied is labor efficiently reallocated in response to productivity differentials. In a frictionless labor market, adjustments occur instantaneously—factors of production are allocated to the most productive activities, and workers move from farm to factories instantaneously and seamlessly. In reality, adjustments occur slowly due to distortions, market failures, market rigidity, and institutional and government failures.¹⁶

In Africa, the lack of high-quality job opportunities could be the most important contributor to the rigidity observed. But the extent of labor market rigidity, the factors that contribute to it, and its relation to structural transformation and high-quality job growth have received limited attention.


This study addresses labor market rigidity in four major African economies—Egypt, Ethiopia, Nigeria, and South Africa—which combined have more than 40 percent of Africa’s population and 50 percent of its GDP. These countries reflect the heterogeneity of employment challenges Africa faces: high unemployment in North African countries and South Africa and pervasive low-quality employment in Sub-Saharan Africa. The analysis addresses the following research questions: To what extent have African labor markets become flexible over the past two decades? To what extent do individual-level factors, such as gender, education, and age, explain labor market rigidity? The study offers new empirical evidence on the ease of entry into and exit from the labor market, mobility between employment and unemployment, mobility between self-employment and wage or salary employment, and mobility between the broad agricultural and nonagricultural sectors to assess long-term labor market rigidity. The analysis

evaluates whether African labor markets have been flexible enough to support structural transformation by efficiently reallocating labor from low- to high-productivity sectors.

The study uses harmonized individual-level labor market data from Labour Force Surveys (LFSs) and IPUMS-International, which cover about 30 million individuals over 1996–2015.¹⁷ Lacking rich panel data, the study constructed pseudo-panel data that correspond to life-course labor market transitions and cover the most important periods in Africa for economic growth and structural transformation. An appropriate pseudo-panel econometric approach addresses issues of endogeneity that may arise due to observed and unobserved heterogeneity.

ACCESS TO FORMAL AND INFORMAL EMPLOYMENT

One of the first papers to connect the theoretical understanding of the informal urban economy with empirical evidence emphasized a systematic difference between subsectors of the informal urban economy.¹⁸ Analysts should observe the sharp distinctions within the informal economy between the “easy-entry informal sector” and the “upper tier informal sector.” Workers consider the easy-entry sector as worse than formal sector employment because of low wages, the lack of protection, and so on. But they consider upper tier informal sector employment as better than formal sector employment because flexibility and higher wages are more appealing for high-human-capital workers who can establish their own small firms. From a labor market perspective, ease of entry is the crucial characteristic of the informal urban economy.¹⁹ Transitions between formal employment, informal employment or underemployment, and unemployment depend on the ease of entry as well as wages. There may be transitions from formal employment to upper tier informal employment that do not reduce wages or welfare. However, the informal rural economy is notably missing from that model, and this study aims to



assess it empirically. Researchers have paid increasing attention to rural livelihood diversification and questioned the assumption that people in rural areas are earning a living from agriculture alone. Ellis states that, based on both large-scale national surveys and smaller, targeted surveys, about 50 percent of average rural household income comes from nonfarm work or transfers from urban areas or abroad.²⁰

Another study, the first to use panel data to estimate earning differentials and transitions between the formal and informal sectors of a developing economy, also predicts that informal sector employment may be preferable to formal work for some workers.²¹ Following male workers in Mexico for 15 months, the study found, contrary to theoretical predictions, that workers moving into formal work earned significantly less, while workers moving into informal work earned significantly more. (As the author himself notes, the data did not account for nonwage benefits in either sector.) The study also found evidence of systematically different informal sectors, since there are significant wage differentials between different kinds of informal work. The study found high turnover in the formal sector and shows that searches for work cross all sectors, rather than preferring formal sector work. So, in Mexico at least, some informal sector employment is not just a safety net or holding tank for workers waiting to enter formal employment.

Access to informal sector employment was historically more challenging for women and non-whites than for white men in a study from South Africa using retrospective recall data for 1951–91.²² Lower levels of education and experience compounded these effects, leaving some groups unable to transition to the informal economy when the formal economy suffered from economic downturns. The study's limitations include the use of recall data and assumptions about which jobs were informal and which were formal, and the results are correspondingly noisy. But the summary statistics show informal economy participation contracting during formal economic upturns and expanding

during formal downturns. This safety net finding contrasts with the studies just described.

A study of market changes in South Africa in the years following the 1994 transition from apartheid asked why unemployment in South Africa remained high, accounting for sectoral composition changes and individual-level wage outcomes.²³ The unemployment rate in South Africa is high even among African countries, and the duration of individuals' unemployment is long. The authors found that, unlike in other African countries, the informal economy was unable to expand to include workers who would otherwise be unemployed. While the overall employment rate remained stable, a great deal of individual churning took place, with individuals changing employment status frequently throughout the year. Also, race, along with education and age, is important in the South African labor market.

Structural transformation affects not just the nation and region but the household, where decisions are made, often jointly, on what sector to work in and where to live while doing so. A study of household-level occupational decision in Tanzania examined household allocation of labor to farming, wage employment, and self-employment operating a small enterprise.²⁴ The study used simulated shocks to predict how households move from one sector to another. Most households did not switch from one activity to another or change the mix of activities between survey rounds, especially for agricultural work. Households that diversify into wage or self-employment did not completely stop agricultural participation, pointing to the important safety net role of agriculture in rural communities.

DATA AND DESCRIPTIVE RESULTS

Reliable and consistent individual-level survey data on labor force participation and employment are often lacking in African countries. Few countries carry out regular Labour Force Surveys (LFS), and national censuses, conducted every

ten years, are often outdated. This study conducts detailed, micro-level analysis of a substantial segment of the population over a period that corresponds to long-term development processes. To do so, it combined nationally representative micro-level data from two sources: LFSs and IPUMS-International—the Integrated Public Use Microdata Series-International harmonized by the Center for Population Studies at the University of Minnesota.²⁵

The data cover about 30 million individuals in four countries, covering 18–20 years: Egypt, 1996–2013; Ethiopia, 1994–2013; Nigeria, 2006–2015, and South Africa, 1996–2014 (table 1). The harmonized data include key variables on individuals' labor market status and demographic characteristics collected consistently over time and across countries. The outcome variables include labor market participation, employment status, and detailed sector of employment. Demographic characteristics include age at the time of survey, gender, marital status, level of education, area of residence, survey year, country dummies, and survey type. The harmonized variables allow country-specific and pooled analyses.

Egypt

As across much of North Africa and the Middle East, unemployment in Egypt is largely characterized by an inability to absorb youth who have recently completed their education into the formal economy.²⁶ Egyptian youth have two different life courses: the first is the “traditional” path, in which youth leverage family or other social connections to enter the labor force directly after completing their education. The second is the “modern” path, in which youth suffer an often extended period of unemployment before entering the labor market. Very slow uptake into the labor force contributes to massive rates of labor force inactivity among Egyptians, with more than half the population on average classified as inactive across all years (see table 2). Those who follow the modern life course tend to be more educated than those in the traditional path, contrary to expectations that returns

TABLE 1
Surveys—years, countries, and numbers

Survey year	Country	Numbers		
		IPUMS-I	LFS	Pooled
1996	Egypt	4,797,998	0	4,797,998
2006	Egypt	4,733,066	0	4,733,066
2012	Egypt	0	195,488	195,488
2013	Egypt	0	179,692	179,692
1994	Ethiopia	4,630,117	0	4,630,117
1999	Ethiopia	0	156,174	156,174
2005	Ethiopia	0	148,018	148,018
2007	Ethiopia	4,158,631	0	4,158,631
2013	Ethiopia	0	116,497	116,497
2006	Nigeria	65,425	0	65,425
2007	Nigeria	62,934	0	62,934
2008	Nigeria	76,532	0	76,532
2009	Nigeria	53,608	0	53,608
2010	Nigeria	50,612	0	50,612
2014	Nigeria	0	267,575	267,575
2015	Nigeria	0	84,402	84,402
1996	South Africa	2,738,818	0	2,738,818
2001	South Africa	2,730,309	0	2,730,309
2007	South Africa	575,589	0	575,589
2008	South Africa	0	222,854	222,854
2009	South Africa	0	207,260	207,260
2010	South Africa	0	193,260	193,260
2011	South Africa	2,523,077	183,836	2,706,913
2012	South Africa	0	184,183	184,183
2013	South Africa	0	182,287	182,287
2014	South Africa	0	174,260	174,260
Total				29,692,502

Source: Data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: LFS is Labour Force Surveys. IPUMS is Integrated Public Use Microdata Series-International.

to education should be high and that more education should lead to better job outcomes. Working age Egyptians may be disillusioned by the lack of returns to education, since educational attainment is mostly stable or falling (table 3). In 2013, 44 percent of the working age sample had no education or less than a primary education, up from 38 percent in 2006. Secondary attainment education rates grew between 1998 and 2006, and university rates between 1998 and 2012, but both fell between 2012 and 2013. The labor market is also characterized by a pronounced gender wage gap

TABLE 2
Labor market participation, Egypt (percent)

	1996	2006	2012	2013	Pooled
Employed	32	42	50	50	43
Self-employed	27	9	29	29	24
Wage/salary	69	90	62	61	70
Unemployed	4	4	6	5	5
Inactive	64	54	44	45	52
Number of observations	9,896,147				

Source: Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.

and employment discrimination that favors men at the expense of women in all sectors. It is most pronounced in manual, blue-collar jobs but extends to public sector employment.²⁷ So, education and gender are likely to shape labor market transitions for Egyptians.

Egypt's economy since 1994 has largely been shaped by two waves of government reform, both aiming at economic liberalization and growth. The first occurred in 1991, as part of a structural adjustment program to boost market openness and encourage private sector participation in the

economy, especially in manufacturing. The second occurred in 2004, intended to further boost the private sector by reducing trade barriers and increasing the ease of doing business.²⁸ But the reforms have not done enough, and the 2008 global financial crisis also set growth back. Ali and Msadfa describe Egypt as being in a state of growth-reducing structural change, where low-productivity industries such as mining and agriculture are attracting job seekers, who either cannot find jobs in higher-productivity industries or are unqualified for them due to eroding human capital attainment. The financial crisis also affected labor market participation: although employment increased after it, the bulk of growth is coming from self-employment, rather than wage or salary employment. It is likely that the self-employed work is low growth and low wage.

In a country experiencing positive-growth structural transformation, the share of the workforce in agriculture would be declining, but in Egypt, it fluctuates around a mean of about 26 percent (table 4). Both agriculture and construction appear to be shelter sectors, where people find work when the more advanced sectors are declining.²⁹

TABLE 3
Age, locale, marital status, and educational level of individuals born between 1936 and 1985, Egypt

Percent

	1996	1998	2006	2012	2013	Pooled
Male	51	50	50	49	49	50
Age	26.34 (15.02)	28.64 (15.79)	34.92 (14.96)	41.08 (14.52)	42.83 (14.10)	35.43 (16.01)
Urban	44	56	50	50	46	50
Marital status: single/never married	53	52	33	16	13	32
Marital status: married	44	44	60	75	77	61
Marital status: separated	1	1	1	1	1	1
Marital status: widowed	3	4	6	8	9	6
Education: none or less than primary	50	44	38	38	44	42
Education: primary	16	28	16	12	10	16
Education: secondary	17	18	33	30	28	27
Education: university	5	10	13	20	18	14
Education: unknown	0	0	0	0	0	0
Number of observations						9,976,966

Source: Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.
Note: Standard deviations in parentheses.

TABLE 4
Sectoral employment of workers born between 1936 and 1985, Egypt (percent)

	1996	2006	2012	2013	Pooled
Agriculture	32.4	25.9	25.9	26.6	27.4
Industry	22.8	23.0	23.7	22.6	23.0
Mining	0.4	0.2	0.2	0.2	0.2
Manufacturing	13.1	12.0	10.7	10.1	11.3
Utilities	1.0	1.4	1.9	2.0	1.6
Construction	8.3	9.5	11.0	10.4	9.9
Services	44.8	51.1	50.4	50.7	49.6
Trade	10.4	13.8	13.2	13.2	12.8
Transport	6.0	7.8	7.8	7.9	7.5
Finance	3.1	3.4	3.2	3.1	3.2
Community	22.4	21.1	21.8	21.9	21.8
Household	0.3	0.7	0.0	0.0	0.2
Other	2.6	4.2	4.4	4.5	4.1
Number of observations	3,675,741				

Source: Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.

Supporting this inference (though not conclusively), the peak rate of workers in trade—an industry likely to be among the most affected by the 2004 reforms—appeared in 2006.

There is evidence that Egypt recovered from the global financial crisis of 2008, since participation in agriculture was near its lowest rate in 2012, while participation in industry and services were near their highest. But the rebound dissipated by the next year, when rates returned to their pre-crisis levels, labor market inactivity increased, and the percentage working for a wage or salary decreased (see table 2).

Ethiopia

The contribution of off-farm income to total income in Ethiopia, especially in rural parts, is surprisingly low: 18 percent, exactly half the African average of 36 percent.³⁰ Perhaps even more surprising, the share of off-farm income as a percentage of total income is highest for households in the lowest income quintile and lowest for those in the highest. These figures highlight the small-scale nature of

off-farm, nonagricultural work in rural Ethiopia, since household enterprises are likely no more productive than agricultural work and require little to no capital investment. An overwhelming number of people are self-employed: 91 percent of the 83 percent who are employed (table 5). The household head's education level is the primary determinant of share of nonfarm income in a family's total income.³¹ So, while self-employment requires little investment of physical capital, it takes a great deal of human capital.

During the past decade and a half, when Ethiopia experienced one of the highest food price inflations in the world, wage growth and access to stable jobs became all the more important.³² The effect on the rural poor was ambiguous, since they are both producers and consumers of agricultural commodities. But because the urban poor are, by and large, only consumers, the labor market underwent enormous strain to provide employment whose wages kept pace with inflation. Employers had little incentive to increase wages, because the urban labor market had considerable slack, with unemployment averaging around 20 percent. As in Egypt, there was a significant gender gap in unemployment, though human capital differentials between men and women did more to explain it in Ethiopia than in Egypt.³³

In Ethiopia, in contrast to Egypt, workers are responding positively to increased incentives for human capital attainment (table 6). The percentage

TABLE 5
Labor market participation status, Ethiopia

Percent

	1999	2005	2007	2013	Pooled
Employed	83	82	77	84	83
Self-employed	91	91	88	88	91
Wage/salary	9	9	12	12	9
Unemployed	17	2	2	3	16
Inactive	—	16	21	13	1
Number of observations	922,113				

Source: Ethiopian Labour Force Survey and IPUMS-International.

TABLE 6**Age, locale, marital status, and educational level of individuals born between 1936 and 1985, Ethiopia**

Percent

	1994	1999	2005	2007	2013	Pooled
Male	50	56	47	50	49	56
Age	23.68 (14.70)	30.42 (14.32)	34.81 (14.50)	35.77 (13.81)	41.32 (13.75)	30.56 (14.41)
Urban	14	11	17	19	n/a	11
Marital status: single/never married	53	33	20	17	8	33
Marital status: married	39	57	67	72	78	57
Marital status: separated	4	6	6	5	6	6
Marital status: widowed	3	4	7	6	8	4
Education: none or less than primary	90	77	71	82	66	77
Education: primary	6	18	22	12	22	18
Education: secondary	2	3	6	5	7	3
Education: university	0	1	2	0	3	1
Education: unknown	1	—	—	1	—	1
Number of observations						4,883,314

Source: Ethiopian Labour Force Survey and IPUMS-International.
Note: Standard deviations in parentheses.

of the working age population completing both secondary school and university increased, although the share is still very low compared with the world average, or even the African one. The increase is taking place even though most Ethiopians are in rural locales, where educational attainment is expected to be lower.

Ethiopia experienced one of the highest growth rates in the world during 1994–2013, although its impact across the income distribution has been debated. Growth was 8 percent a year even after the 2015–16 El Nino droughts, which many predicted would seriously reverse the progress Ethiopia had made in the prior ten years. At least one-fourth of the growth can be attributed to infrastructure projects, with a modest shift of workers from agriculture to more modern sectors, especially construction and services (table 7).³⁴ However, the service enterprises were likely to be small scale, given the sectoral composition of workers. Although the percentage of workers in agriculture remains high, it declined throughout 1999–2013. This transition is also likely responsible for the large decrease in the percentage of unemployed from 17 percent in 1999 to 3 percent in 2013.

TABLE 7**Sectoral employment of workers born between 1936 and 1985, Ethiopia (percent)**

	1999	2005	2013	Pooled
Agriculture	78.0	77.4	71.4	77.0
Industry	6.0	—	8.8	6.0
Mining	0.1	—	0.4	0.1
Manufacturing	4.8	—	5.5	4.8
Utilities	0.1	—	0.5	0.1
Construction	1.0	—	2.3	1.1
Services	16.0	—	19.9	16.1
Trade	10.2	—	7.5	10.2
Transport	0.6	—	1.2	0.6
Finance	0.2	—	1.4	0.3
Community	2.9	—	4.1	2.9
Household	0.9	—	4.5	0.9
Other	1.2	—	1.2	1.2
Number of observations				714,882

Source: Ethiopian Labour Force Survey and IPUMS-International.

The growth led by public investment highlights the role of the public sector in the Ethiopian labor market. In urban areas, up to half of wage employees are employed by the public sector in some

capacity. Labor productivity in the private sector remains low, and increases are needed, especially for the lowest-skilled workers, to keep the marginal product of labor above the poverty wage rate. Competition for jobs comes from two sources—workers with a primary or secondary education unable to find work matching their qualifications, and workers migrating from rural to urban areas willing to be underemployed in manual sectors for a very low wage.³⁵ Overall, Ethiopia is following a much more standard structural development than Egypt, although starting from much farther back.

Nigeria

In Nigeria, conflict along ethnic and, by extension, regional lines has contributed to Nigeria's politically turbulent past and, some experts argue, stalled its economic growth.³⁶ How do the conflicts affect the labor market? Uwaifo Oyelere found that mean incomes and returns to education were similar across Nigeria's three major ethno-regional areas.³⁷ Her study was unable, however, to distinguish outcomes for individuals inside and outside the region where their ethnic group is predominant.

Nigeria's manufacturing sector has declined because of a human capital issue: manufacturing firms use low-skill, low-wage labor not because higher-skill labor is unavailable, but because they cannot afford the wages demanded by higher-skill labor. Although Nigeria's levels of human capital attainment are not as high as South Africa's, Nigerians are more and more likely to have completed secondary education or have a university degree, at rates about on par with Egypt's by 2015 (table 8). So, industry is stuck using outdated technology, with low returns and low productivity,³⁸ and Nigeria's rate of unemployment is among Africa's highest, estimated at 37 percent, and higher among youth.³⁹ Highlighting growth without jobs, unemployment has been increasing at the same time GDP was increasing by 6 percent a year.⁴⁰

Economic growth has been hampered by overdependence on primary natural resources, especially oil, a common finding in studies of the Nigerian manufacturing sector.⁴¹ The country's stability, both economic and political, is closely tied to the price of oil, and the government makes many concessions to the oil industry at the

TABLE 8

Age, locale, marital status, and educational level of individuals born between 1936 and 1985, Nigeria

Percent

	2006	2007	2008	2009	2010	2014	2015	Pooled
Male	50	50	50	51	50	50	50	50
Age	25.76 (15.55)	26.53 (15.60)	27.64 (15.49)	29.11 (15.36)	29.98 (15.23)	33.82 (14.87)	34.66 (14.74)	30.53 (15.54)
Urban	24	31	36	34	24	31	31	30
Marital status: single/never married	53	50	48	47	46	35	34	43
Marital status: married	42	44	48	48	50	58	60	52
Marital status: separated	2	2	1	2	1	2	3	2
Marital status: widowed	3	2	2	3	3	4	4	3
Education: none or less than primary	51	48	46	41	37	0	0	25
Education: primary	28	28	30	32	30	18	19	24
Education: secondary	18	19	19	23	23	40	41	29
Education: university	3	3	4	5	3	11	12	7
Education: unknown	1	1	1	0	6	31	28	14
Number of observations								660,595

Source: General Household Survey, 2006–10; Labour Force Survey, 2014–15.
Note: Standard deviations in parentheses.

TABLE 9
Labor market participation status, Nigeria, 2006–15 (percent)

	2006	2007	2008	2009	2010	2014	2015	Pooled
Employed	38	50	51	63	55	65	68	58
Self-employed	89	86	88	88	—	90	91	89
Wage/salary	11	14	12	12	—	13	12	12
Unemployed	1	2	2	1	2	8	6	5
Inactive	60	48	46	35	43	28	25	38
Number of observations								615,623

Source: General Household Survey, 2006–10; Labour Force Survey, 2014–15.

expense of others. Despite Nigeria's large reserves of crude oil, corruption, political instability, and mismanagement of oil revenues at even the highest levels of government have contributed to the stagnation of Nigeria's manufacturing sector since the 1980s. Corruption goes beyond the ministers and high government officials to industry managers and hiring personnel, with nepotism and other corrupt hiring practices making job searches inefficient and unequal.⁴²

The issues of job market and labor force accessibility are reflected in Nigeria's labor market participation rates (table 9). The country appears to be afflicted, unfortunately, with similar labor market setbacks to those in Egypt and Ethiopia. Nigeria has the same high rate of inactivity that defines Egyptian labor market participation and the same high rate of self-employment among those employed that is found in Ethiopia. Nigerians are challenged when trying to access the formal employment portion of the labor market.

The discovery of oil and the subsequent oil boom of the 1970s interrupted Nigeria's structural transformation by undercutting the agricultural sector. First, the boom caused massive rural-to-urban migration, especially of men, who often left their families behind to continue low-productivity farming. Second, the government's investment in the oil industry came at the expense of continued investment in programs to improve agricultural productivity and move the rural population out of poverty. So, agriculture failed to become highly productive or less labor reliant. However,

corrective policies in the past decade have shown some success, with the percentage of workers in industry increasing and the percentage in agriculture decreasing (table 10). Nigeria's service sector is also well developed, with an average service sector participation rate almost double Ethiopia's. However, as in Ethiopia, these service jobs are probably informal, given the rates of self-employment (see table 9).

South Africa

Inequality pervaded South African politics and economics for most of its modern history, and labor market outcomes are no exception. Under the widespread apartheid system, agriculture was modernized through government support for white farmers, who controlled most of the productive land and other capital inputs, while little protection went to farm workers, most of whom were black.⁴³ Various measures replicated these inequalities throughout the economy. Today, South Africa has very high rates of unemployment, especially compared with its BRICS (Brazil, Russia, India, China, and South Africa) peers. The high unemployment rate is partly due to a decline in manufacturing jobs creation, especially in labor-intensive industries such as textiles. Inequality persists because of the skill differential between unskilled and skilled workers on one hand and mismatch between skilled workers and managerial positions, which is greater than in any other BRICS country. Education and training gaps contribute to the widening inequality.⁴⁴ Only half of South Africans are employed, with the remaining

TABLE 10**Sectoral composition of workers born between 1936 and 1985, Nigeria (percent)**

	2006	2007	2008	2009	2010	2014	2015	Pooled
Agriculture	56.0	49.2	50.8	56.3	60.7	42.0	37.8	47.2
Industry	1.8	7.9	6.9	9.2	3.7	9.4	11.8	8.1
Mining	0.2	0.4	0.2	0.3	0.2	0.2	0.2	0.2
Manufacturing	0.1	5.2	4.7	7.3	2.1	6.7	8.5	5.6
Utilities	0.4	0.7	0.3	0.3	0.2	0.7	0.9	0.6
Construction	1.1	1.5	1.7	1.3	1.2	1.8	2.2	1.6
Services	42.0	42.9	42.4	34.5	35.3	36.1	42.3	43.0
Trade	20.0	21.1	21.6	16.4	15.2	23.1	28.9	21.9
Transport	2.6	3.2	3.4	2.7	2.3	4.2	4.7	3.6
Finance	1.0	1.2	3.1	3.3	2.0	2.9	2.9	2.6
Community	7.9	10.1	7.9	7.7	8.0	—	—	8.3
Household	0.5	0.5	0.2	0.3	0.0	0.3	0.2	0.3
Other	10.0	6.8	6.1	4.0	7.8	5.5	5.7	6.3
Number of observations								362,092

Source: General Household Survey, 2006–10; Labour Force Survey, 2014–15.

half split fairly evenly between unemployment and inactivity (table 11).

Educational attainment in South Africa, although low when compared with Organisation for Economic Co-operation and Development (OECD) countries, is following a hopeful trend (table 12). The percentage of citizens with no education has declined to an all-time low, while the percentage of people with upper-secondary or tertiary degrees has increased, especially among youth. Secondary educational attainment was higher in South Africa than in Egypt, Ethiopia, or Nigeria by 2014. When apartheid ended in 1994, the gap between men and women in upper-level

educational attainment was substantial; as of 2010, it had nearly been eradicated. However, systematic gaps between white and black South Africans have been more persistent, although the gaps in primary and lower-secondary education have narrowed since apartheid. Gaps between whites and blacks in higher education attainment have continued and even increased, exacerbating inequality and skill differentials along racial lines.⁴⁵

South Africa appears to be farther along in the traditional structural transformation process than Egypt, Ethiopia, or Nigeria, though progress came at the expense of equality. Agricultural employment fell to one-third its all-time high

TABLE 11**Labor market participation rates, South Africa (percent)**

	1996	2001	2007	2008	2009	2010	2011	2012	2013	2014	Pooled
Employed	35	34	42	47	46	46	47	48	50	50	45
Self-employed	13	10	16	6	6	6	9	8	8	8	8
Wage/salary	87	90	85	83	83	82	83	83	83	84	84
Unemployed	24	29	30	20	22	24	25	23	23	22	24
Inactive	41	37	29	33	32	31	28	29	28	28	31
Number of observations											8,508,415

Source: General Household Survey, 2006–10; Labour Force Survey, 2014–15.

TABLE 12**Age, locale, marital status, and educational level of individuals born between 1936 and 1985, South Africa (percent)**

	1996	2001	2007	2008	2009	2010	2011	2012	2013	2014	Pooled
Male	47	48	46	48	48	48	48	48	48	48	48
Age	26.57 (15.09)	31.35 (14.92)	36.84 (14.82)	37.19 (14.59)	38.07 (14.58)	38.89 (14.53)	39.8 (14.46)	40.68 (14.38)	41.63 (13.99)	42.45 (13.90)	37.42 (15.24)
Urban	55	59	65	.	67	68	68	69	70	70	66
Marital status: single/never married	64	57	49	48	47	46	44	43	42	41	48
Marital status: married	31	37	43	43	44	45	47	47	47	48	43
Marital status: separated	2	3	3	3	3	3	3	3	3	3	3
Marital status: widowed	2	4	5	6	6	7	6	7	8	8	6
Education: none or less than primary	39	29	19	7	7	6	12	3	0	0	13
Education: primary	42	49	54	13	12	12	27	14	17	16	26
Education: secondary	14	21	22	68	68	68	50	65	62	62	49
Education: university	1	2	4	11	12	13	10	12	10	10	9
Education: unknown	4	0	1	1	1	1	1	2	3	3	2
Number of observations											9,915,780

Source: South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Standard deviations in parentheses.

in the 1960s, shifted by rural-to-urban migration and other factors that have increased the cost of agricultural labor (table 13). Agricultural minimum wage laws, which went into effect in 2003, encouraged landowners and other employers of

agricultural labor to invest in mechanization and other labor-saving, productivity-enhancing inputs.⁴⁶ Agricultural enterprises also rely more on seasonal labor, rather than employing workers year-round.⁴⁷ And South African farms have

TABLE 13**Sectoral composition of workers born between 1936 and 1985, South Africa (percent)**

	1996	2001	2007	2008	2009	2010	2011	2012	2013	2014	Pooled
Agriculture	8.9	10.1	7.1	5.7	5.1	4.9	2.3	4.8	4.8	4.5	5.2
Industry	23.2	22.7	25.5	25.8	25.3	24.4	24.2	23.6	23.5	23.5	24.2
Mining	3.0	3.9	3.9	2.4	2.4	2.3	2.4	2.6	2.8	2.9	2.8
Manufacturing	12.8	12.6	14.6	14.4	13.8	13.3	13.3	12.7	12.2	11.6	13.1
Utilities	1.2	0.7	0.8	0.7	0.7	0.7	0.6	0.7	0.9	0.8	0.8
Construction	6.2	5.5	6.2	8.4	8.4	8.1	7.9	7.5	7.6	8.2	7.5
Services	67.9	67.2	67.4	68.5	69.6	70.6	71.1	71.7	71.8	72.0	70.1
Trade	12.7	15.2	14.2	22.9	22.0	22.3	22.3	21.7	20.6	20.3	20.0
Transport	5.6	4.6	4.0	5.7	5.7	5.9	5.8	6.0	6.2	6.2	5.6
Finance	8.1	9.4	6.0	12.2	13.2	12.7	12.9	13.1	13.6	13.5	11.8
Community	15.8	16.8	13.6	19.0	19.9	20.9	21.7	22.4	22.9	23.6	20.1
Household	11.8	9.9	8.6	8.7	8.8	8.8	8.4	8.4	8.5	8.4	8.9
Other	14.0	11.3	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
Number of observations											3,334,215

Source: South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

experienced the structural change common to most developed country agricultural systems: the number of farms declined sharply, while the size of the farms increased steadily to an average of more than 2,000 hectares.

Another sign of the formality of the South African economy is the high rate of unemployment, as opposed to inactivity (see table 1). “Unemployed” indicates that someone is actively looking for work or receiving unemployment benefits. A developing economy that lacks the infrastructure to provide such benefits will see people lapse into inactivity. Further, South Africa’s rate of self-employment is lower than Egypt’s, Ethiopia’s, or Nigeria’s, and the great majority of employed persons are formally employed and receive a wage or salary.

As the importance of agriculture has fallen in South Africa, manufacturing and services have developed. Improving the manufacturing sector was a political goal of the new democratic government at the end of apartheid. Reintegration of the South African economy into the World Trade Organization helped to promote manufacturing and move South African exports away from dependence on primary commodities, especially gold. However, the share of manufacturing in GDP has been falling from the highs of the early years after the end of apartheid, and the service sector has become dominant, now accounting for two-thirds of GDP.⁴⁸ Services accounted for almost 75 percent of jobs in the mid-2010s—the most robust service sector of the four economies studied.

EMPIRICAL METHODS

This study uses two empirical approaches to examine the degree of long-term labor market mobility in Egypt, Ethiopia, Nigeria, and South Africa, after creating a pseudo-panel from the data sources described above. The first empirical approach is to nonparametrically estimate simple transition matrices and mobility indices across different labor market statuses. The second approach is a pseudo-panel econometric estimation

of mobility between different labor market statuses in order to distinguish true state dependence from spurious relationships after controlling for observed and unobserved heterogeneity. (See the annex for a full discussion of methods.)

RESULTS AND DISCUSSIONS

Long-term labor market transitions

Transition probabilities and mobility indices are estimated over two historically important periods: late 1990s–2005/2006 and 2006–2014/2015. The first period roughly corresponds to the boom in commodity prices and acceleration of economic growth experienced in most African economies. The second period corresponds to two episodes of global economic crisis: the 2007–08 financial crises and the sharp 2008–09 downturn in commodity prices.

The long-term Egyptian and South African labor markets exhibit some similarities in the labor market statuses of inactivity, employment, and unemployment, but they are markedly different from those of Nigeria and Ethiopia (table 14). This unsurprising result reflects the greater economic development in South Africa and Egypt than in the other two countries. Working age individuals who started off employed in 1996 in Egypt had a 64 percent chance of staying employed in 2006, and those who started off employed in 2001 in South Africa had a 66 percent chance of staying employed in 2007.

Three key differences can be observed between the Egypt and South Africa’s labor market mobility patterns. The first is that while the probability of an Egyptian worker remaining employed increased to 81 percent in the second period (2006–13), it decreased for a South African worker to 52 percent (2007–14), mainly due to workers exiting the labor market. There are two potential explanations. First, South Africa’s greater integration with the international economy would increase its exposure to the 2007–08 global financial

TABLE 14
Transition matrices: Broader labor market statuses

	Year [t]					
	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive
	Egypt: 1996–2006			Egypt: 2006–13		
Employed	0.64	0.01	0.35	0.81	0.04	0.15
Unemployed	0.68	0.03	0.28	0.67	0.11	0.22
Inactive	0.23	0.02	0.75	0.3	0.05	0.65
	South Africa: 2001–07			South Africa: 2007–14		
Employed	0.66	0.15	0.19	0.52	0.17	0.31
Unemployed	0.49	0.28	0.24	0.48	0.26	0.26
Inactive	0.41	0.27	0.32	0.3	0.16	0.53
	Ethiopia: 1999–2005			Ethiopia: 2005–13		
Employed	0.77	0.04	0.18	0.84	0.03	0.13
Unemployed	0.77	0.03	0.2	0.78	0.09	0.14
Inactive	0.74	0.03	0.22	0.72	0.06	0.22
	Nigeria: 2006–14					
Employed				0.88	0.06	0.07
Unemployed				0.80	0.07	0.14
Inactive				0.73	0.11	0.18

Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

crisis, and in its more advanced economy, South Africa's informal sector would have less capacity than Egypt's to absorb excess labor during economic turmoil. Second, South Africa's generous social protection and benefits—unemployment insurance, a disability grant, a care dependency grant, and an old-age pension system—could offer an additional incentive for discouraged workers unable to find employment to exit the labor market altogether.

The second key difference is that in Egypt the probability of unemployed individuals staying unemployed increased considerably from 3 percent in 1996–2006 to 11 percent in 2006–13, while in South Africa it remained high at 26–28 percent, reflecting persistent high unemployment rates even after the end of apartheid (during which the labor market had been segmented along racial lines).

The third key difference is the higher rate of inactivity in Egypt and the greater difficulty in entering the labor market. About 75 percent of working

age individuals in Egypt who reported inactivity in 1996 were still out of the labor force 10 years later, compared with 32 percent in South Africa. Although Egypt's rate of continuing inactivity declined to 65 percent in 2006–2013, it remained the highest of the four countries being studied. Egypt's low labor market participation rate could partly be explained by the wide gender gap in participation, since women face difficulties in accessing the labor market due to cultural, religious, and institutional factors. Less than one quarter of working age women in Egypt participated in the labor market in 2013 compared with 65 percent in Nigeria and 60 percent in South Africa.

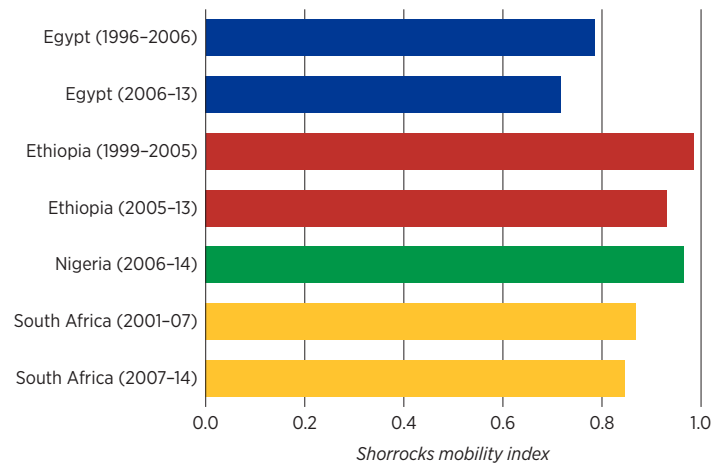
Ethiopia and Nigeria share key labor market features typical of Sub-Saharan African countries. In both, employed individuals have high chances of staying employed and the unemployed have low chances of staying unemployed. For instance, workers who were employed in 2005 in Ethiopia had an 84 percent chance of staying employed in 2013, and workers who were employed in 2006 in Nigeria had

an 88 percent chance of staying employed in 2014, whereas those who were unemployed in Ethiopia had only a 9 percent chance of remaining unemployed during the same period, and in Nigeria, 7 percent. This flexibility reflects these economies' ability to absorb workers into agriculture and informal sector work. The second shared feature is low rigidity in entering and exiting the labor market. Ethiopian working age individuals out of the labor market in 2005 had a 22 percent chance of remaining inactive in 2013, and Nigerians out of the labor market in 2006 had an 18 percent chance of remaining out in 2014—both probabilities much lower than those in Egypt and South Africa. This, again, demonstrates the important role of the informal sector, where very low barriers to entry enable it to provide workers an employment safety net. However, the work is unlikely to be remunerative for the workers or highly productive or structurally transformative for the economy.

Labor markets in Ethiopia, with a Shorrocks mobility index of 0.93 in 2005–13, and Nigeria, with 0.97 in 2006–14, were much more flexible than the labor markets during the same decade in Egypt, with an index of 0.72, and South Africa, with 0.85 (figure 1).⁴⁹ The mobility indices for Ethiopia and Nigeria seem to have been driven by the relatively high probability of working age individuals entering the labor market (presumably finding employment in agriculture and the informal sector), and the relatively low chances of their remaining unemployed and inactive, compared with chances in Egypt and South Africa.

Much labor market mobility in Egypt in 1996–2006 represented individuals moving from self-employment and unemployment into the wage/salary sector (table 15). They mainly went into the public sector, which accounted for more than one-fifth of total employment in the country. More recently, however, the chance of moving into self-employment increased considerably, indicating the growing importance of self-employment in Egypt in absorbing the unemployed and new labor market entrants. In contrast, in South Africa, transition into self-employment declined, while the probabilities of

FIGURE 1
Shorrocks mobility indices



Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

moving into wage/salary employment and exiting the labor market altogether increased. Although this change could represent structural progress for South African economy overall, it could also mean that those who are systematically less able to access the formal labor market are falling through the cracks into unemployment.

In South Africa, the role of the self-employed or informal sector is declining, since the probability of remaining self-employed between 2007 and 2014 was only 4 percent, compared with 15 percent between 2001 and 2007. However, without the backstop of an informal sector, the probability of someone remaining inactive in South Africa increased markedly, from 32 percent between 2001 and 2007 to 53 percent between 2007 and 2014. Rates of staying in formal sector employment or in unemployment between the two periods remained constant.

Self-employment is dominant in Ethiopia's labor market. For instance, a worker who was self-employed in 1999 had a 64 percent chance of staying in the same status in 2006. Despite the high economic growth that the country achieved in recent years, the importance of self-employment in the labor market has increased, with the chances

TABLE 15
Transition matrices: Detailed labor market statuses

		Year [t]								
		Self-employed	Wage/salary	Unemployed	Inactive	Self-employed	Wage/salary	Unemployed	Inactive	
		Egypt: 1996–2006				Egypt: 2006–13				
Year [t-1]	Self-employed	0.09	0.64	0.01	0.27	0.30	0.56	0.04	0.10	
	Wage/salary	0.07	0.56	0.01	0.37	0.26	0.54	0.04	0.16	
	Unemployed	0.06	0.61	0.03	0.29	0.20	0.48	0.09	0.23	
	Inactive	0.02	0.22	0.02	0.75	0.13	0.18	0.05	0.65	
	Mobility index					0.86				
			South Africa: 2001–07				South Africa: 2007–14			
	Self-employed	0.15	0.59	0.10	0.16	0.04	0.42	0.16	0.39	
	Wage/salary	0.12	0.53	0.16	0.20	0.03	0.49	0.19	0.29	
	Unemployed	0.08	0.42	0.28	0.23	0.02	0.45	0.26	0.27	
	Inactive	0.07	0.34	0.27	0.32	0.02	0.28	0.17	0.53	
Mobility index					0.91					
		Ethiopia: 1999–2005				Ethiopia: 2005–13				
Self-employed	0.64	0.13	0.04	0.19	0.73	0.10	0.03	0.14		
Wage/salary	0.56	0.21	0.07	0.16	0.66	0.19	0.04	0.10		
Unemployed	0.56	0.14	0.04	0.26	0.56	0.22	0.07	0.14		
Inactive	0.65	0.11	0.04	0.21	0.56	0.17	0.06	0.20		
Mobility index					0.97					

Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; and iii) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Due to data sparseness in the cohort cell for the detailed labor market statuses, transition matrices are not calculated for Nigeria.

of a self-employed worker remaining in the same status increasing from 64 percent in 1999–2005 to 73 percent in 2005–13. Moreover, the sector continued to absorb the unemployed, new labor market entrants, and workers who were previously wage/salary employees.

Individual mobility between different labor market statuses depends on age, gender, social ties, skill mismatch, education, search and moving costs, geographic preferences, and psychological costs of changing jobs—and could contribute to labor market rigidity, often referred to as “sticky feet.”⁵⁰ Demand-side factors also contribute, such as low demand and high costs of hiring and firing. Possible market-level factors include job–skill mismatches and the inefficient flow of information on vacancies. And macroeconomic conditions, weak labor market institutions, strict labor regulations and conventions, and inefficiencies in capital

and land markets and product markets contribute to labor market rigidity.

Labor market entry and exit

Transition matrices, though informative of the overall degree of labor market mobility, are limited in disentangling the relative importance of the factors in labor market rigidity. A linear dynamic random effects estimation controls for cohort-level observed and unobserved heterogeneity as well as initial labor market conditions (tables 16–20). If workers can easily enter and exit the labor market, the true state dependence parameter is expected to be zero and statistically insignificant. Whenever there are frictions or entry barriers, however, the coefficient is expected to be positive and statistically significant.

The true state dependence coefficients are positive and significant for five specifications (year fixed

effects, demographic characteristics, birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions) for all four countries. In Egypt, a 1 percent higher inactivity rate in the previous period increases the likelihood of remaining inactive in the current period by 0.20 percentage point. Similar results are found in South Africa, where the likelihood increases by 0.42 percentage point, and Nigeria, where it increases by 0.29 percentage point. Individuals in Ethiopia, however, seem to enter and exit the labor market with relative ease, as the estimated degree of rigidity is only 0.16 percentage point, which could be explained by the relative abundance of farm employment in rural areas, where close to 80 percent of the population resides, and the increasing availability of informal employment opportunities in urban centers, particularly for migrant workers.

Much of the rigidity in entry and exit can be explained by individual-level factors. For instance, when the model controlled for gender, marital

status, household size, and relation to the head, the coefficient for Egypt declined from 0.39 (in table 16 specification 1) to 0.27 (in table 16, specification 2). It declined to 0.20, when the model further controlled for birth year, education, unobserved heterogeneity, and initial labor market conditions (in table 16, specification 5). So, close to 48 percent of the rigidity in labor market entry and exit in Egypt could be explained by individual-level factors, with the remaining 52 percent due to lack of demand and institutional, regulatory, and other factors. Similarly, the observed levels of rigidity in Nigeria and South Africa could be attributed to individual-level factors, with no strong evidence suggesting the same for Ethiopia. In Ethiopia, the role played by individual characteristics in determining labor market rigidity is much lower, meaning that there are fewer systematic barriers based on personal factors like gender. What determines individual entry and exit in Ethiopia, is, therefore, based on idiosyncratic personal characteristics that influence how well a person can navigate the institutional and

TABLE 16
Dynamic random effects estimation of labor market entry and exit: Egypt

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged participation rate	0.388*** (0.020)	0.272*** (0.019)	0.202*** (0.017)	0.224*** (0.017)	0.203*** (0.022)	0.07 (0.220)
Lagged participation rate X [male]						-0.107*** (0.033)
Lagged participation rate X [primary]						0.0849*** (0.030)
Lagged participation rate X [secondary]						0.0780** (0.031)
Lagged participation rate X [university]						0.04 (0.032)
Observations	1,147	1,147	1,147	1,147	1,143	1,143
Number of cohorts	579	579	579	579	575	575
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$.

Source: Authors' calculations using data from Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 17**Dynamic random effects estimation of labor market entry and exit: Ethiopia**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged participation rate	0.194*** (0.0333)	0.0763** (0.0311)	0.0179 (0.0298)	-0.0187 (0.0294)	0.161*** (0.043)	0.0155 (0.126)
Lagged participation rate X [male]						0.0195 (0.0915)
Lagged participation rate X [primary]						0.0643 (0.111)
Lagged participation rate X [secondary]						0.397*** (0.122)
Lagged participation rate X [university]						0.316* (0.159)
Observations	857	857	857	857	777	777
Number of cohorts	477	477	477	477	397	397
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Ethiopian Labour Force Survey and IPUMS-International.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 18**Dynamic random effects estimation of labor market entry and exit: Nigeria**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged participation rate	0.666*** (0.0112)	0.371*** (0.0153)	0.321*** (0.0159)	0.315*** (0.016)	0.288*** (0.0174)	0.309*** (0.0557)
Lagged participation rate X [male]						-0.0916*** (0.0328)
Lagged participation rate X [primary]						0.0423 (0.0262)
Lagged participation rate X [secondary]						0.0569* (0.0291)
Lagged participation rate X [university]						0.0212 (0.0308)
Observations	3,184	3,184	3,184	3,184	3,110	3,110
Number of cohorts	590	590	590	590	563	563
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$.

Source: Authors' calculations using data from Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 19
Dynamic random effects estimation of labor market entry and exit: South Africa

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged participation rate	0.876*** (0.00848)	0.516*** (0.0166)	0.349*** (0.0169)	0.354*** (0.0162)	0.423*** (0.0182)	0.211*** (0.0686)
Lagged participation rate X [male]						0.0450* (0.0241)
Lagged participation rate X [primary]						0.101*** (0.0218)
Lagged participation rate X [secondary]						0.127*** (0.0239)
Lagged participation rate X [university]						0.0713*** (0.0251)
Observations	3,551	1,310	1,310	1,310	1,188	1,188
Number of cohorts	590	590	590	590	500	500
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$.

Source: Authors' calculations using data from South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

contextual barriers that explain more of the variation in entry/exit rigidity.

To assess the extent of rigidity for different groups of individuals, the model interacted the lagged dependent variable with gender, grouped birth year, and levels of education. The coefficients on the interaction terms (specification 6) show the relative rigidity for that particular group of interest compared with the reference group.⁵¹ Gender and education emerge as significant factors in labor market rigidity in Egypt. For every 1 percent increase in the previous inactivity rate, for instance, men have a 0.11 percentage point lower probability of staying inactive compared with women. Moreover, individuals with primary and secondary levels of education face higher rigidity in entry and exit, compared with low-skilled individuals with no or less than primary education. Individuals with secondary education in Ethiopia and Nigeria, and any level of education above primary in South Africa, face difficulty entering and exiting the labor markets compared

with low-skilled (uneducated) individuals. Education, perversely, seems to restrict the jobs individuals can access, either due to demand-side (overqualification) or supply-side (holding out for remunerative jobs) factors. Younger Nigerians—those born after 1982—face some difficulty in entering the labor market compared with the older cohort. But South African youth born after 1973 face relatively less difficulty in moving into and out of the labor force.

Across countries, a pooled regression used Egypt as a reference country and interacted the lagged dependent variable with the country dummies (see table 20). Entry into and exit from the labor market is much easier in Ethiopia and Nigeria than in Egypt (column 5, the final model specification). Individuals in Ethiopia have a 0.09 percentage point lower chance of entering the labor market in the current period than a typical working age Egyptian. And individuals in Nigeria have a 0.12 percentage point lower chance. Not surprisingly, there is no statistically significant difference in rigidity

TABLE 20**Dynamic random effects estimation of labor market entry and exit: Pooled**

	(1)	(2)	(3)	(4)	(5)
Lagged participation rate	0.723*** (0.0165)	0.667*** (0.0175)	0.586*** (0.017)	0.588*** (0.0169)	0.563*** (0.0181)
Lagged participation rate X [Ethiopia]	-0.393*** (0.0363)	-0.429*** (0.0369)	-0.405*** (0.0351)	-0.412*** (0.035)	-0.0857** (0.0418)
Lagged participation rate X [Nigeria]	-0.236*** (0.0212)	-0.267*** (0.0231)	-0.164*** (0.0222)	-0.155*** (0.0222)	-0.123*** (0.0202)
Lagged participation rate X [South Africa]	-0.0101 (0.0212)	-0.0588** (0.0265)	-0.0899*** (0.0251)	-0.0886*** (0.0251)	0.00725 (0.024)
Ethiopia	0.381*** (0.0286)	0.446*** (0.0295)	0.438*** (0.0281)	0.445*** (0.0281)	0.123*** (0.0357)
Nigeria	0.227*** (0.0162)	0.274*** (0.0224)	0.308*** (0.0216)	0.301*** (0.0216)	0.319*** (0.0219)
South Africa	-0.0245* (0.014)	0.0999*** (0.0218)	0.193*** (0.0211)	0.194*** (0.0211)	0.0758*** (0.0207)
Observations	8,738	6,497	6,497	6,497	6,218
Number of cohorts	2,235	2,235	2,235	2,235	2,035
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓
Education dummies	—	—	—	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions.

between South African and Egyptian labor markets. The higher rigidity in Egypt, even after individual-level characteristics were controlled for, could be attributed to low labor demand due to premature deindustrialization in the past decade and a half, when the share of employment in manufacturing declined. At the same time, public sector employment, which already accounts for a relatively large proportion of employment in Egypt compared with other African countries, seems to be saturated. Further, the segregated, antiblack labor market and the country's relatively generous social benefit programs—child support, care dependency grants, disability grants, unemployment insurance, and an old-age pension system—could discourage working age individuals from actively seeking employment. Moreover, unlike Sub-Saharan African countries, relatively modern economies in Egypt and South Africa have small informal sectors with limited capacity to absorb excess labor that tend to concentrate in urban centers.

Mobility between employment and unemployment

For labor market mobility between employment and unemployment, except for Ethiopia, the true state dependence parameters on employment are all positive and statistically significant, in that workers face rigidity (tables 21–25). In the full model (column 5), after controlling for observed characteristics and unobserved heterogeneity, the coefficient of rigidity in Egypt is 0.26 percentage point, in Nigeria 0.22 percentage point, and in South Africa, 0.38 percentage point. Ethiopia shows no statistically significant level of rigidity in movement between employment and unemployment.

The decreasing magnitude of the coefficient as more explanatory variables are added into the model suggests that rigidity could be explained by worker-level factors, mainly demographic

TABLE 21**Dynamic random effects estimation of mobility between employment and unemployment: Egypt**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged employment rate	0.464*** (0.0206)	0.346*** (0.0215)	0.253*** (0.0194)	0.284*** (0.0193)	0.262*** (0.0252)	-0.0345 (0.227)
Lagged employment rate X [male]						-0.116*** (0.0363)
Lagged employment rate X [primary]						0.0675** (0.0318)
Lagged employment rate X [secondary]						0.0850*** (0.0324)
Lagged employment rate X [university]						0.0485 (0.0336)
Observations	1,147	1,147	1,147	1,147	1,143	1,143
Number of cohorts	579	579	579	579	575	575
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 22**Dynamic random effects estimation of mobility between employment and unemployment: Ethiopia**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged employment rate	0.148*** (0.0331)	0.0268 (0.0304)	-0.0259 (0.0291)	-0.0773*** (0.0281)	0.0176 (0.0392)	-0.167 (0.13)
Lagged employment rate X [male]						0.0274 (0.0802)
Lagged employment rate X [primary]						0.178 (0.113)
Lagged employment rate X [secondary]						0.290** (0.119)
Lagged employment rate X [university]						0.300* (0.154)
Observations	857	857	857	857	777	777
Number of cohorts	477	477	477	477	397	397
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Ethiopian Labour Force Survey and IPUMS-International.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 23**Dynamic random effects estimation of mobility between employment and unemployment: Nigeria**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged employment rate	0.684*** (0.0116)	0.275*** (0.0152)	0.262*** (0.0157)	0.247*** (0.0158)	0.218*** (0.017)	0.256*** (0.0546)
Lagged employment rate X [male]						-0.0721** (0.0323)
Lagged employment rate X [primary]						0.0284 (0.0261)
Lagged employment rate X [secondary]						0.0505* (0.0281)
Lagged employment rate X [university]						0.0478 (0.0292)
Observations	3,184	3,184	3,184	3,184	3,110	3,110
Number of cohorts	590	590	590	590	563	563
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 24**Dynamic random effects estimation of mobility between employment and unemployment: South Africa**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged employment rate	0.863*** (0.00801)	0.574*** (0.0181)	0.457*** (0.0182)	0.409*** (0.0175)	0.381*** (0.019)	0.306*** (0.0726)
Lagged employment rate X [male]						-0.0674*** (0.0256)
Lagged employment rate X [primary]						0.00618 (0.0304)
Lagged employment rate X [secondary]						0.00749 (0.0277)
Lagged employment rate X [university]						-0.0575** (0.0275)
Observations	3,551	1,310	1,310	1,310	1,188	1,188
Number of cohorts	590	590	590	590	500	500
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 25
Dynamic random effects estimation of mobility between employment and unemployment: Pooled

	(1)	(2)	(3)	(4)	(5)
Lagged employment rate	0.724*** (0.0169)	0.630*** (0.018)	0.554*** (0.0174)	0.554*** (0.0173)	0.470*** (0.0187)
Lagged employment rate X [Ethiopia]	-0.430*** (0.0349)	-0.485*** (0.0354)	-0.440*** (0.0334)	-0.448*** (0.0333)	-0.127*** (0.0393)
Lagged employment rate X [Nigeria]	-0.242*** (0.0214)	-0.340*** (0.023)	-0.241*** (0.022)	-0.231*** (0.0219)	-0.162*** (0.0204)
Lagged employment rate X [South Africa]	0.00589 (0.0227)	-0.014 (0.0284)	-0.0222 (0.0265)	-0.0294 (0.0267)	0.0152 (0.0247)
Ethiopia	0.405*** (0.0259)	0.491*** (0.0267)	0.466*** (0.0253)	0.474*** (0.0252)	0.149*** (0.0321)
Nigeria	0.198*** (0.0157)	0.295*** (0.0218)	0.355*** (0.0209)	0.349*** (0.0209)	0.316*** (0.0215)
South Africa	-0.0484*** (0.0133)	0.0291 (0.0202)	0.107*** (0.0193)	0.113*** (0.0193)	0.0607*** (0.0185)
Observations	8,738	6,497	6,497	6,497	6,218
Number of cohorts	2,235	2,235	2,235	2,235	2,035
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓
Education dummies	—	—	—	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions.

ones, such as gender, birth year, marital status, and education. Individual-level factors account for 46.4 percent of the rigidity in Egypt, 68 percent in Nigeria, and 86.3 percent in South Africa (see columns 1 and 5 in tables 21, 23, and 24). Men face relatively lower rigidity than women, with coefficients of 0.12 percentage point in Egypt, 0.07 in Nigeria, and 0.07 in South Africa. Surprisingly, education actually reduces individual ability to move in and out of employment. For instance, individuals with primary and secondary education in Egypt, secondary and university education in Ethiopia, and secondary education in Nigeria have limited ability to move across different employment statuses compared with individuals with no or less than primary education. This confirms our initial assessment that the jobs in these economies are not appealing to workers with any level of education, who probably would like productive and well-paying jobs. In South Africa, on the other hand, individuals with university education enjoy

more flexibility than the uneducated, while individuals with primary and secondary education face the same rigidity as the uneducated. Compared with workers in Egypt, workers in Ethiopia and Nigeria move between employment and unemployment much more easily, while workers in South Africa face as much rigidity as those in Egypt. Once again, the two more advanced economies (Egypt and South Africa) behave much more similarly to each other, despite many contextual differences, than they do to the less advanced (Nigeria and Ethiopia).

Mobility between sectors of employment

What rigidity faces workers moving between self-employment—low-quality informal sector employment—and high-quality formal sector jobs, in either the private or the public sector, that pay better, provide nonwage benefits, and follow workplace safety regulations? What

rigidity faces those moving between agricultural and nonagricultural employment—to the high-productivity nonagricultural sectors—broadly, services and industry?

Except in Ethiopia, workers face some rigidity in the ability to move from self-employment to wage/salary employment (tables 26–30). After worker-level characteristics and unobserved heterogeneity are controlled for (column 5 in tables 26, 28, and 29), the coefficient of rigidity in Egypt is 0.23 percentage point, in Nigeria 0.14 percentage point, and in South Africa 0.27 percentage point.

In Ethiopia, where self-employment is more prevalent than the other countries, the rigidity in worker ability to transition from self-employment to wage/salary employment seems to be fully attributable to worker-level characteristics, mainly education. In Ethiopia, the coefficient decreased from 0.59 percentage point (see table 27, column 3) to 0.14 percentage point (column 4) after education was controlled for, implying that education

accounts for about 76 percent of the rigidity in worker ability to move from self-employment to wage/salary work. The coefficient further declined to –0.03 in column (5) and became statistically insignificant when unobserved heterogeneity and initial labor market conditions were further controlled for. Moreover, the coefficients on the interaction terms are all statistically insignificant after we control for individual-level factors.

In Egypt, gender also plays a major role in worker ability to move from self-employment to wage/salary employment: men face a 0.19 percentage point lower level of rigidity than do women. In South Africa, however, it is women who have relative flexibility in moving between self-employment and the wage/salary sectors, perhaps due to the large overlap of jobs in the service sector with informal and traditionally female work. In education, the coefficients are insignificant except for Egypt and Nigeria. In Egypt, workers with secondary and university level education and in Nigeria, those with secondary education fare poorly

TABLE 26
Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Egypt

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged self-employment rate	0.491*** (0.0312)	0.424*** (0.0299)	0.354*** (0.0286)	0.323*** (0.028)	0.230*** (0.0288)	0.122* (0.0727)
Lagged self-employment rate X [male]						-0.190*** (0.0476)
Lagged self-employment rate X [primary]						0.054 (0.0497)
Lagged self-employment rate X [secondary]						0.392*** (0.0605)
Lagged self-employment rate X [university]						0.300*** (0.0767)
Observations	975	975	975	975	962	962
Number of cohorts	504	504	504	504	491	491
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.
Source: Authors' calculations using data from Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 27**Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Ethiopia**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged self-employment rate	0.639*** (0.0263)	0.607*** (0.0264)	0.594*** (0.0267)	0.139*** (0.0362)	-0.032 (0.0477)	0.173 (0.566)
Lagged self-employment rate X [male]						0.00739 (0.0388)
Lagged self-employment rate X [primary]						-0.315 (0.576)
Lagged self-employment rate X [secondary]						-0.287 (0.569)
Lagged self-employment rate X [university]						-0.154 (0.572)
Observations	814	814	814	814	755	755
Number of cohorts	449	449	449	449	390	390
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Ethiopian Labour Force Survey and IPUMS-International.

Note: Specifications 1-5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 28**Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Nigeria**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged self-employment rate	0.530*** (0.0164)	0.514*** (0.0165)	0.483*** (0.0173)	0.176*** (0.0221)	0.135*** (0.0268)	-0.0938 (0.0807)
Lagged self-employment rate X [male]						-0.0326 (0.0317)
Lagged self-employment rate X [primary]						0.0368 (0.148)
Lagged self-employment rate X [secondary]						0.177*** (0.0666)
Lagged self-employment rate X [university]						-0.0132 (0.0511)
Observations	1,928	1,928	1,928	1,928	1,788	1,788
Number of cohorts	584	584	584	584	501	501
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Nigerian General Household Survey, 2006-10; Labour Force Survey, 2014-15.

Note: Specifications 1-5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 29**Dynamic random effects estimation of mobility between self-employment and wage/salary employment: South Africa**

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged self-employment rate	0.235*** (0.0166)	0.370*** (0.0314)	0.228*** (0.0281)	0.225*** (0.0286)	0.267*** (0.04)	0.234*** (0.0709)
Lagged self-employment rate X [male]						0.137** (0.0691)
Lagged self-employment rate X [primary]						0.0868 (0.0838)
Lagged self-employment rate X [secondary]						0.0446 (0.103)
Lagged self-employment rate X [university]						-0.017 (0.0939)
Observations	3,413	1,347	1,347	1,347	1,211	1,211
Year fixed effects	✓	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	—	✓	✓	✓
Birth year	—	—	✓	✓	✓	✓
Education dummies	—	—	—	✓	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓	✓
Interaction terms	—	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions. Specification 6 includes interaction terms between the lagged dependent variable and key observable characteristics of interest to our study: gender, education, and birth year.

TABLE 30**Dynamic random effects estimation of mobility between self-employment and wage/salary employment: Pooled**

	(1)	(2)	(3)	(4)	(5)
Lagged self-employment rate	0.629*** (0.0234)	0.730*** (0.0271)	0.710*** (0.0269)	0.691*** (0.0261)	0.664*** (0.0263)
Lagged self-employment rate X [Ethiopia]	0.144*** (0.0314)	-0.00077 (0.0347)	0.00429 (0.0342)	-0.124*** (0.0334)	-0.275*** (0.0362)
Lagged self-employment rate X [Nigeria]	-0.228*** (0.0307)	-0.356*** (0.034)	-0.349*** (0.0337)	-0.468*** (0.033)	-0.577*** (0.0345)
Lagged self-employment rate X [South Africa]	-0.526*** (0.0303)	-0.384*** (0.0427)	-0.413*** (0.0422)	-0.335*** (0.0411)	-0.0564 (0.046)
Ethiopia	-0.0502** (0.02)	0.0621*** (0.0226)	0.0627*** (0.0222)	0.157*** (0.0219)	0.139*** (0.0219)
Nigeria	0.172*** (0.0209)	0.277*** (0.0266)	0.269*** (0.0274)	0.365*** (0.027)	0.237*** (0.027)
South Africa	-0.144*** (0.0116)	0.0283 (0.0197)	0.0350* (0.0202)	0.0365* (0.0195)	-0.0454** (0.0198)
Observations	7,129	5,063	5,063	5,063	4,716
Number of cohorts	2,121	2,094	2,094	2,094	1,850
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	—	✓	✓
Birth year	—	—	✓	✓	✓
Education dummies	—	—	—	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: Specifications 1–5 incrementally add sets of control variables: year fixed effects, demographic characteristics (gender, marital status, household size, and relation to the head), birth year, educational dummies, and controls for unobserved heterogeneity and initial labor market conditions.

compared with individuals with no or less than primary level education. Finally, workers in Ethiopia and Nigeria move between self-employment and wage/salary employment with relative ease compared with those in Egypt workers, whereas the degree of rigidity in South Africa is not statistically different from Egypt's (see table 30).

For all four countries, agricultural workers tend to stay within the sector, even after worker-level characteristics are controlled for (tables 31–35).

Rigidity varies considerably by country and group of individuals. The unadjusted degrees of persistence in agricultural employment are 0.76 percentage point for Egypt, 0.81 for Ethiopia, 0.48 for Nigeria, and 0.40 for South Africa (column 1 of tables 31–34). After observed characteristics of workers and unobserved heterogeneity are controlled for, the magnitude of the coefficients decreases considerably—to 0.27 percentage point for Egypt, 0.20 for Ethiopia, 0.14 for Nigeria, and 0.29 for South Africa (column 5 of tables 31–34).

TABLE 31
Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Egypt

	(1)	(2)	(3)	(4)	(5)
Lagged: employment in agriculture	0.762*** (0.0508)	0.557*** (0.0526)	0.532*** (0.0533)	0.463*** (0.0544)	0.268*** (0.0524)
Lagged: employment in services	0.0116 (0.0435)	-0.184*** (0.0462)	-0.186*** (0.0472)	-0.161*** (0.0478)	-0.0452 (0.0442)
Observations	975	975	975	975	962
Number of cohorts	504	504	504	504	491
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	✓	✓	✓
Birth year	—	—	✓	✓	✓
Education dummies	—	—	—	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013.

Note: In order to avoid multicollinearity, we do not include industry employment rates.

TABLE 32
Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Ethiopia

	(1)	(2)	(3)	(4)	(5)
Lagged: employment in agriculture	0.811*** (0.0242)	0.765*** (0.0242)	0.759*** (0.0246)	0.484*** (0.0362)	0.197*** (0.0575)
Lagged: employment in services	-0.0199 (0.03)	-0.0154 (0.0298)	-0.0148 (0.0299)	-0.036 (0.0288)	-0.046 (0.0292)
Observations	813	813	813	813	755
Number of cohorts	448	448	448	448	390
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	—	✓	—	✓	✓
Birth year	—	—	✓	✓	✓
Education dummies	—	—	—	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Ethiopian Labour Force Survey and IPUMS-International.

Note: In order to avoid multicollinearity, we do not include industry employment rates.

TABLE 33**Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Nigeria**

	(1)	(2)	(3)	(4)	(5)
Lagged: employment in agriculture	0.478*** (0.0394)	0.479*** (0.0388)	0.468*** (0.0388)	0.127*** (0.0368)	0.142*** (0.0398)
Lagged: employment in services	0.0452 (0.0402)	0.0782** (0.0398)	0.0828** (0.0399)	0.0567 (0.0355)	0.0625* (0.0378)
Observations	2,909	2,909	2,909	2,909	2,677
Number of cohorts	584	584	584	584	498
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	–	✓	–	✓	✓
Birth year	–	–	✓	✓	✓
Education dummies	–	–	–	✓	✓
Chamberlain time means and initial values	–	–	–	–	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from Nigerian General Household Survey, 2006–10; Labour Force Survey, 2014–15.

Note: In order to avoid multicollinearity, we do not include industry employment rates.

TABLE 34**Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: South Africa**

	(1)	(2)	(3)	(4)	(5)
Lagged: employment in agriculture	0.401*** (0.0184)	0.429*** (0.0288)	0.404*** (0.029)	0.394*** (0.0291)	0.289*** (0.0349)
Lagged: employment in services	-0.0898*** (0.0116)	-0.0551*** (0.0214)	-0.0734** (0.0216)	-0.0515** (0.0225)	-0.0736*** (0.0229)
Observations	3,266	1,255	1,255	1,255	1,135
Number of cohorts	575	545	545	545	457
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics.	–	✓	–	✓	✓
Birth year	–	–	✓	✓	✓
Education dummies	–	–	–	✓	✓
Chamberlain time means and initial values	–	–	–	–	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008–10, 2012–14.

Note: In order to avoid multicollinearity, we do not include industry employment rates.

Moving out of agriculture is much more difficult for farm workers in Egypt and South Africa than for those in Ethiopia and Nigeria. The skill sets of Egyptian and South African agricultural workers are less likely to transfer to the nonfarm economies than are the skills of their Ethiopian or Nigerian counterparts. Nonetheless, individual-level observed and unobserved factors account for 66 percent of the rigidity in Egypt, 75 percent of that in Ethiopia, 70 percent of that in Nigeria, and 28 percent of that in South Africa. This implies

that empowering women and improving such worker-level conditions as education could pay off considerably in easing the movement of people out of agriculture, especially in Ethiopia and Nigeria.

Egypt and Ethiopia are experiencing no significant shift from service sector employment to agriculture, with South Africa experiencing a strong negative shift, implying a continued exodus from agriculture. Alarming, however,

TABLE 35
Dynamic random effects estimation of mobility between agricultural and non-agricultural employment: Pooled

	(1)	(2)	(3)	(4)	(5)
Lagged: employment in agriculture	0.980*** (0.0454)	1.079*** (0.0504)	1.077*** (0.0506)	1.006*** (0.0481)	0.937*** (0.0456)
Lagged: employment in services	0.0826** (0.039)	0.166*** (0.0431)	0.170*** (0.0434)	0.247*** (0.0414)	0.391*** (0.0402)
Lagged: employment in agriculture X [Ethiopia]	-0.127** (0.0511)	-0.243*** (0.0563)	-0.243*** (0.0565)	-0.380*** (0.0539)	-0.456*** (0.0523)
Lagged: employment in agriculture X [Nigeria]	0.578*** (0.0542)	-0.572*** (0.0595)	-0.575*** (0.0597)	-0.715*** (0.0569)	-0.713*** (0.0554)
Lagged: employment in agriculture X [South Africa]	-0.658*** (0.0563)	-0.516*** (0.0764)	-0.521*** (0.0765)	-0.610*** (0.0722)	-0.619*** (0.0746)
Lagged: employment in services X [Ethiopia]	-0.087* (0.0505)	-0.163*** (0.0552)	-0.166*** (0.0554)	-0.263*** (0.0529)	-0.414*** (0.0525)
Lagged: employment in services X [Nigeria]	-0.0432 (0.0493)	-0.115** (0.0537)	-0.120** (0.0539)	-0.199*** (0.0514)	-0.331*** (0.0511)
Lagged: employment in services X [South Africa]	-0.161*** (0.0445)	-0.138** (0.0583)	-0.147** (0.0585)	-0.0263 (0.0554)	-0.226*** (0.0557)
Ethiopia	0.110*** (0.0377)	0.203*** (0.0423)	0.205*** (0.0425)	0.340*** (0.0406)	0.424*** (0.0397)
Nigeria	0.199*** (0.0446)	0.263*** (0.0522)	0.272*** (0.0531)	0.385*** (0.0506)	0.384*** (0.0498)
South Africa	0.0976** (0.0382)	0.120** (0.0516)	0.133** (0.0522)	0.0631 (0.0493)	0.185*** (0.0488)
Observations	7,963	5,952	5,952	5,952	5,529
Number of cohorts	2,111	2,081	2,081	2,081	1,836
Year fixed effects	✓	✓	✓	✓	✓
Demographic characteristics	—	✓	—	✓	✓
Birth year	—	—	✓	✓	✓
Education dummies	—	—	—	✓	✓
Chamberlain time means and initial values	—	—	—	—	✓

Standard errors in parentheses. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.1$.

Source: Authors' calculations using data from i) Egyptian Census, 1996, 2006; Labor Market Dynamics Survey, 1998, 2006, 2012; Labour Force Survey, 2012, 2013; ii) Ethiopian Labour Force Survey and IPUMS-International; iii) Nigerian General Household Survey, 2006-10; Labour Force Survey, 2014-15; iv) South African Census, 1996, 2001, 2007, 2011; Labour Force Survey, 2008-10, 2012-14.

Note: In order to avoid multicollinearity, we do not include industry employment rates.


Nigerian workers have been moving from the service sector to agriculture, in a reverse structural transformation. The result reflects Nigeria's oil-dependent economy, with a stagnating manufacturing sector unable to create enough high-quality jobs, so that some low-skilled workers have been forced to migrate back to rural areas from the crowded urban centers, where living costs have skyrocketed. It is also possible that wage and nonpecuniary differentials between the predominantly informal service sector (mainly trade) and agricultural activities are narrowing, so that for low-skilled workers, farm activities are becoming more attractive.

CONCLUSION AND POLICY RECOMMENDATIONS

The informal sector

Employment in Sub-Saharan Africa is highly variable, with a great diversity and flexibility of both employment status and sector. The growth of the continent's largest economies, however, seems to have arrived without the benefit of stable, formal employment for most citizens, especially in rural areas.

The sustained growth and development probably rely on the large and pervasive informal sector.



That complex sector encompasses pursuits ranging from productive, high-quality entrepreneurship to activity that is, unfortunately, a mere step above begging. The informal sector's continued presence implies that it benefits those who consume its services and products, which it provides to the market cheaply and, some might argue, efficiently. Formal sector employees use the informal market to extend their own salaries by procuring goods and services at lower prices. The lower prices, of course, come at the expense of informal sector employees, who tend to be paid much less than formal sector employees, lack the worker protections and regulations of the formal sector, and are not protected by the safety nets that to some extent support formal sector employees. But it is difficult to finally condemn the informal sector, given that, especially for less developed economies, it offers flexibility. As shown in this study, workers who cannot find formal sector employment in less developed countries do not immediately fall into unemployment or inactivity as they would in more developed economies. Instead, their labor is absorbed into the “informal economy safety net,” which provides a level of employment, though one perhaps less remunerative.

The flexibility benefits individuals with determination and persistence, or with high skills, who can be productively and gainfully employed without the restraints imposed by the formal sector. However, protective policies do not target those people, but rather those who find themselves in the informal sector as a last resort.

Thus, this study recommends a policy approach that acknowledges the important role played by the informal sector and the value of the services rendered by those employed there. Although recommending one policy is difficult for the four economies studied here with their vastly different stages of development, policymakers should recognize the informal sector in the less developed economies as an important stepping-stone to economic development. Provisions that protect the rights of these workers, including a streamlined process to formality allowing them to collect social benefits, would be ideal.

Demand-side employment factors

About half the variation in labor market entry/exit rigidity can be explained, on average, by the observed characteristics of workers, according to the results of this study. The other half, therefore, comes from demand-side lack of high-quality job opportunities and institutional factors, which are notoriously hard to address through policy. However, the increased labor market rigidity for more educated workers shown in this study demonstrates that jobs appealing to those with even a rudimentary education are, simply, not there. Furthermore, educated workers cannot be reabsorbed into the informal employment market, which appears saturated with workers with lower human capital attainment. One possible remedy is widening entrepreneurship opportunities that provide financial and intellectual rewards for those with education. Supply-side reasons, including the stigma of informal sector work, probably play a huge role in the rigidity preventing educated workers from benefiting from informal sector flexibility. Nevertheless, the usual recommendations stand about improving demand-side job creation through proper investment, curbing corruption, and improving the ease of doing business in Egypt, Ethiopia, Nigeria, and South Africa. An economy cannot develop if those investing in education cannot find productive work. Brain drain and economic stagnation will follow.

The rural labor market

The study's results on workers exiting agriculture and rigidity highlight the huge gap between the urban and rural sectors. The nonfarm rural labor market absolutely must be supported, especially in the age of megacities, where the population has far surpassed the capacity of the infrastructure to support it.

In an almost perverse way, the result from Nigeria in which people leave the service sector and return to agriculture may be heartening. People who return to rural areas having experienced the nonfarm sector, whether formal or informal, are more

likely to develop nonfarm enterprises than the average people in rural areas. Government support for the rural nonfarm economy must be guaranteed if structural transformation is to occur. This may involve initially thinking small—providing small-scale support for informal cottage industries and nonfarm service providers. Provisions such as income insurance or other livelihood guarantees would give such enterprises the confidence they need to expand, growing the nonfarm economy from the ground up.

The ease with which workers move between different statuses of employment (such as employment or unemployment) and between different sectors of employment (such as agricultural and non-agricultural) affects whether or not an economy can mobilize quickly to benefit from changing worldwide conditions, investments, and regulatory frameworks. That ease of mobility also indicates systematic limitations on certain groups of people and tells whether, once limitations have been identified, they can be removed. Finally, the informal sector has some ability to absorb excess labor from an improperly functioning formal sector, although it is impossible to make a normative assessment of informality's role in these economies. So, governments and policymakers should think of the informal sector as something to be outgrown, rather than something to be ignored or, worse, uprooted entirely.

NOTES

1. While the intensity of poverty, measured by the poverty gap, declined from 26 percent to 16 percent during the same period, it is still high compared with the world average of 3.2 percent.
2. Structural transformation is broadly defined as the reallocation of economic activities—labor, land, capital, and other factors of production—across the broad sectors of agriculture, manufacturing, and services (McMillan and Rodrik 2011). Structural transformation is at the crux of economic development that sustains improved welfare and living standards, and the speed of economic transformation determines the pace of poverty reduction (Duernecker

- et al. 2016; McMillan and Harttgen 2014; Herrendorf, Rogerson, and Valentinyi 2013).
3. AfDB 2018; Newman et al. 2016; Page and Shimeles 2015.
4. Tiffen 2003.
5. Malik and Awadallah 2013.
6. Fox, Thomas, and Haines 2017.
7. Page and Soderbom 2015.
8. Fox and Gaal 2008; Fox and Sohnesen 2012.
9. Newman et al. 2016.
10. Rosser, Rosser, and Ahmed 2000.
11. Jutting, Laiglesia, and Jutting 2009.
12. Jutting, Laiglesia, and Jutting 2009.
13. McCullough 2017.
14. Caselli 2005; Restuccia, Yang, and Zhu 2008.
15. Teal 2011; Sen 2016.
16. Moreover, factors such as job search costs, skill mismatches, family ties and social capital, labor regulations and conventions, geographic preference and relocation costs, psychological costs of changing jobs, and severance and hiring costs of employers contribute to labor market rigidity, often referred to as “sticky feet” (Hollweg et al. 2014).
17. IPUMS-I is the Integrated Public Use Microdata Series, International, compiled by the Minnesota Population Center.
18. Fields 1990.
19. Fields 1990.
20. Ellis 2005.
21. Maloney 1999.
22. McKeever 2006.
23. Banerjee et al. 2008.
24. McCullough 2016.
25. The IPUMS for Egypt is a census sample which was obtained from the Population, Housing, and Establishment Census of 1996 and 2006. The data were collected by the Central Agency for Public Mobilization and Statistics. The censuses cover all individuals (Egyptians and foreigners) present within the political boundaries of Egypt on the night of the census. The enumeration unit is the household for people who live in households and the individual for public housing residents. The sample is drawn from an Egyptian census and represents 10 percent of the census. For Nigeria, the IPUMS data include the yearly General Household Surveys collected in 2006, 2007, 2008, 2009, and 2010. The survey is collected by

the Nigerian National Bureau of Statistics. For South Africa, the IPUMS data are census samples from the Population Census of 1996, 2001, and 2007, which were collected by Statistics South Africa.

26. Assaad and Krafft 2016.
27. Said 2009.
28. Ali and Msadfa 2016.
29. Ali and Msadfa 2016.
30. Bachewe et al. 2016.
31. Bachewe et al. 2016.
32. Headey et al. 2012.
33. Headey et al. 2012.
34. World Bank 2016.
35. World Bank 2016.
36. Obadina 1999.
37. Uwaifo Oyelere 2007.
38. Malik, Teal, and Baptist 2006.
39. Asaju, Arome, and Anyio 2014.
40. Asaju, Arome, and Anyio 2014.
41. Ku, Mustapha, and Goh 2010.
42. Asaju, Arome, and Anyio 2014.
43. Bhorat, Kanbur, and Stanwix 2014.
44. Kaplan 2015.
45. OECD 2017.
46. Bhorat, Kanbur, and Stanwix 2014.
47. Liebenberg 2013.
48. Kaplan 2015.
49. See annex 1 for calculation of the Shorrocks mobility index.
50. Hollweg et al. 2014.
51. The reference groups for gender, birth cohort, and education, respectively, are female, oldest cohort, and the group with none or less than primary education.
52. Deaton 1985; Bourguignon, Goh, and Kim 2004; Antman and McKenzie 2007; Cruces, Perez-Truglin, and Tetaz 2013; Dang and Lanjouw 2013.
53. Deaton 1985.
54. Shorrocks and Foster 1987.
55. Papke and Wooldridge 2008.
56. Mundlak 1978.

REFERENCES

- AfDB (African Development Bank). 2019. *African Economic Outlook 2018: Macroeconomic Development and Structural Change*. Abidjan, Côte d'Ivoire.
- Ali, A.A., and Y. Msadfa. 2016. "Industrial Policy, Structural Change and Global Value Chains Participation: Case Study of Morocco, Tunisia and Egypt." OCP Policy Center Research Paper No. 1604, Rabat, Morocco.
- Antman, F., and D.J. McKenzie. 2007. "Earnings Mobility and Measurement Error: A Pseudo-panel Approach." *Economic Development and Cultural Change* 56 (1): 125–161.
- Asaju, K., S. Arome, and S.F. Anyio. 2014. "The Rising Rate of Unemployment in Nigeria: The Socio-economic and Political Implications." *Global Business and Economics Research Journal* 3 (2): 12–32.
- Assaad, R., and C. Krafft. 2016. "Labor Market Dynamics and Youth Unemployment in the Middle East and North Africa: Evidence from Egypt, Jordan and Tunisia." Economic Research Forum Working Paper Series No. 993, Giza, Egypt.
- Bachewe, F.N., G. Berhane, B. Minten, and A.S. Taffesse. 2016. *Non-farm Income and Labor Markets in Rural Ethiopia, Volume 90*. Washington, DC: International Food Policy Research Institute.
- Banerjee, A., S. Galiani, J. Levinsohn, Z. McLaren, and I. Woolard. 2008. "Why Has Unemployment Risen in the New South Africa?" *Economics of Transition* 16 (4): 715–740.
- Bhorat, H., R. Kanbur, and B. Stanwix. 2014. "Estimating the Impact of Minimum Wages on Employment, Wages, and Non-wage Benefits: The Case of Agriculture in South Africa." *American Journal of Agricultural Economics* 96 (5): 1402–1419.
- Bourguignon, F., C.-C. Goh, and D.I. Kim. 2004. *Estimating Individual Vulnerability to Poverty with Pseudo-panel Data*. Washington, DC: World Bank.
- Caselli, F. 2005. "Accounting for Cross-Country Income Differences." Discussion Paper DP0667, Centre for Economic Performance, London School of Economics, London.
- Cruces, G., R. Perez-Truglia, and M. Tetaz. 2013. "Biased Perceptions of Income Distribution and Preferences for Redistribution: Evidence from a Survey Experiment." *Journal of Public Economics* 98 (1): 100–112.
- Dang, H.-A., and P. Lanjouw. 2013. *Measuring Poverty Dynamics with Synthetic Panels Based on Cross-sections*. Washington, DC: World Bank.

- Deaton, A. 1985. "Panel Data from Time Series of Cross-sections." *Journal of Econometrics* 30 (1–2): 109–126.
- Duernecker, G., B. Herrendorf, and A. Valentinyi. 2016. "Unbalanced Growth Slowdown." Manuscript, University of Mannheim, Arizona State University, and Cardiff Business School.
- Ellis, F. 2005. *Small Farms, Livelihood Diversification, and Rural–Urban Transitions: Strategic Issues in Sub-Saharan Africa: The Future of Small Farms*. Kent, UK: IFPRI, Overseas Development Institute and Imperial College.
- Fields, G.S. 1990. "Labour Market Modelling and the Urban Informal Sector: Theory and Evidence." Ithaca, NY: Cornell University ILR School.
- Fox, L., and T.P. Sohnesen. 2012. "Household Enterprises in Sub-Saharan Africa: Why they Matter for Growth, Jobs, and Livelihoods." World Bank Policy Research Working Paper No. 6184, Washington, DC.
- Fox, M.L., and M.S. Gaal. 2008. *Working Out of Poverty: Job Creation and the Quality of Growth in Africa*. Washington, DC: World Bank.
- Fox, M.L., M.A.H. Thomas, and C. Haines. 2017. *Structural Transformation in Employment and Productivity: What Can Africa Hope For?* Washington, DC: International Monetary Fund.
- Headey, D., F.B. Nisrane, I. Worku, M. Dereje, and A.S. Taffesse. 2012. "Urban Wage Behavior and Food Price Inflation: The Case of Ethiopia." Ethiopia Strategy Support Programme II Working Paper No. 41, Washington, DC.
- Herrendorf, B., R. Rogerson, and A. Valentinyi. 2013. *Growth and Structural Transformation*. Cambridge, MA: National Bureau of Economic Research.
- Hollweg, C.H., D. Lederman, D. Rojas, and E.R. Bulmer. 2014. *Sticky Feet: How Labor Market Frictions Shape the Impact of International Trade on Jobs and Wages*. Washington, DC: World Bank.
- Jutting, J., J.R. de Laiglesia, and J. Jutting. 2009. *Is Informal Normal? Towards More and Better Jobs in Developing Countries*. Paris, France: OECD.
- Kaplan, D.E. 2015. "The Structure and Performance of Manufacturing in South Africa." *Structural Change and Industrial Development in the BRICS*, 244.
- Ku, H.S., U. Mustapha, and S. Goh. 2010. "Literature Review of Past and Present Performance of the Nigerian Manufacturing Sector: Proceedings of the Institution of Mechanical Engineers, Part B." *Journal of Engineering Manufacture* 224 (12): 1894–1904.
- Liebenberg, F. 2013. "South African Agricultural Production, Productivity and Research Performance in the 20th Century." PhD thesis, University of Pretoria.
- Malik, A., and B. Awadallah. 2013. "The Economics of the Arab Spring." *World Development* 45 (1): 296–313.
- Malik, A., F. Teal, and S. Baptist. 2006. "The Performance of Nigerian Manufacturing Firms: Report on the Nigerian Manufacturing Enterprise Survey." Report submitted to the Centre for the Study of African Economies, Oxford, UK.
- Maloney, W.F. 1999. "Does Informality Imply Segmentation in Urban Labor Markets? Evidence from Sectoral Transitions in Mexico." *The World Bank Economic Review* 13 (2): 275–302.
- McCullough, E.B. 2016. *Occupational Choice and Agricultural Labor Exits in Sub-Saharan Africa*. Abidjan, Côte d'Ivoire: African Development Bank.
- . 2017. "Labor Productivity and Employment Gaps in Sub-Saharan Africa." *Food Policy* 67 (1): 133–152.
- McKeever, M. 2006. "Fall Back or Spring Forward?: Labor Market Transitions and the Informal Economy in South Africa." *Research in Social Stratification and Mobility* 24 (1): 73–87.
- McMillan, M.S., and K. Harttgen. 2014. *What is Driving the African Growth Miracle?* Cambridge, MA: National Bureau of Economic Research.
- McMillan, M.S., and D. Rodrik. 2011. *Globalization, Structural Change and Productivity Growth*. Cambridge, MA: National Bureau of Economic Research.
- Mundlak, Y. 1978. "On the Pooling of Time Series and Cross Section Data." *Econometrica: Journal of the Econometric Society* 46 (1): 69–85.
- Newman, C., J. Page, J. Rand, A. Shimeles, M. Soderbom, and F. Tarp. 2016. *Made in Africa: Learning to Compete in Industry*. Washington, DC: Brookings Institution Press.

- Obadina, T. 1999. "Nigeria's Economy at the Crossroads." *African Recovery* 13 (1): 14.
- OECD (Organisation for Economic Co-operation and Development). 2017. *Getting Skills Right: South Africa*. Paris, France.
- Page, J., and A. Shimeles. 2015. "Aid, Employment and Poverty Reduction in Africa." *African Development Review* 27 (S1): 17–30.
- Page, J., and M. Soderbom. 2015. "Is Small Beautiful? Small Enterprise, Aid and Employment in Africa." *African Development Review* 27 (S1): 44–55.
- Papke, L.E., and J.M. Wooldridge. 2008. "Panel Data Methods for Fractional Response Variables with an Application to Test Pass Rates." *Journal of Econometrics* 145 (1): 121–133.
- Restuccia, D., D. Yang, and X. Zhu. 2008. "Agriculture and Aggregate Productivity: A Quantitative Cross-Country Analysis." *Journal of Monetary Economics* 55 (2): 234–250.
- Rosser, J.B., M.V. Rosser, and E. Ahmed. 2000. "Income Inequality and the Informal Economy in Transition Economies." *Journal of Comparative Economics* 28 (1): 156–171.
- Said, M. 2009. *The Fall and Rise of Earnings and Inequality in Egypt: New Evidence from the Egypt Labor Market Panel Survey 2006*. Cairo, Egypt: American University in Cairo Press.
- Sen, K. 2016. "The Determinants of Structural Transformation in Asia: A Review of the Literature." Asian Development Bank Economic Working Paper No. 478, Mandaluyong, Philippines.
- Shorrocks, A. F., and J.E. Foster. 1987. "Transfer Sensitive Inequality Measures." *The Review of Economic Studies* 54 (3): 485–497.
- Teal, F. 2011. *Structural Transformation, Employment Creation, and Labor Markets: The Implications for Poverty Reduction in Sub-Saharan Africa*. Washington, DC: World Bank.
- Tiffen, M. 2003. "Transition in Sub-Saharan Africa: Agriculture, Urbanization and Income Growth." *World Development* 31 (8): 1343–1366.
- Uwaifo Oyelere, R. 2007. "Disparities in Labor Market Outcomes across Geopolitical Regions in Nigeria: Fact or Fantasy?" IZA Discussion Paper No. 3082, Bonn, Germany.
- World Bank. 2016. "5th Ethiopia Economic Update: Why So Idle? Wages and Employment in a Crowded Labor Market." Technical report. Washington, DC.

ANNEX EMPIRICAL METHODS

Pseudo-panel data construction

The common challenge in estimating comparable labor market transition parameters is the lack of consistent panel data. To tackle that issue, this study constructed pseudo-panels from the repeated cross-sectional data. In the absence of real panel data, the pseudo-panel approach is widely applied in the literature to estimate mobility across different states over time, such as mobility across employment status, occupations, and poverty levels.⁵² The key assumption of the approach is that individuals within a cohort who share common characteristics behave in a similar fashion.⁵³

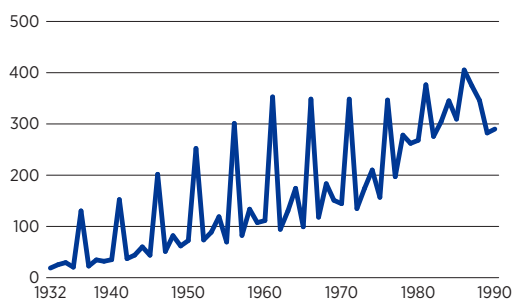
The pseudo-panel for each country is constructed to approximate the typical structure of panel data, following a group of individuals within a certain cohort over time. Such an approach allows

examination of the labor market transitions that a typical worker experiences over the course of his or her life. The pseudo-panels are arranged by fixing the birth years for cohorts of individuals born in a certain year as well as using time-invariant individual characteristics—specifically, birth year, gender, and four educational dummies (less than primary, primary, secondary, and university)—to define each cohort cell. This allocation gives a fairly large cohort size in each birth year–gender–education cell. Observations are restricted to individuals who were 6–64 years old at the start of the follow-up. The lower age limit of the cohorts was relaxed at the beginning of the follow-up period to have sufficient representation of youth and adolescents by the end of the follow-up periods. Due to the availability of data, the follow-up periods differ across countries: 1996–2013 for Egypt, 1999–2013 for Ethiopia, 2006–15 for Nigeria, and 1996–2014 for South Africa. Figure A1 shows the number of individuals in each birth year–gender–education cohort cell for each country.

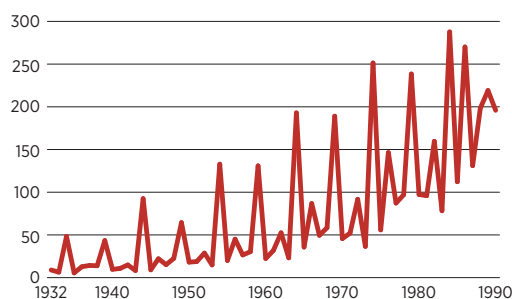
FIGURE A1
Number of individuals in each birth year–gender–education cell, by country

Thousands

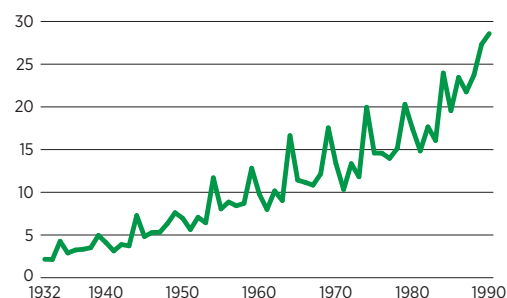
(a) Egypt



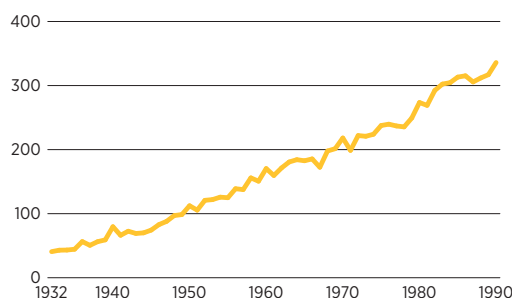
(b) Ethiopia



(c) Nigeria



(d) South Africa



Accordingly, the cohort sizes are 574 for Egypt, 541 for Ethiopia, 398 for Nigeria, and 572 for South Africa. The final number of observations in the final econometric analysis may decrease slightly from these totals due to missing values in some of the explanatory variables.

Long-term labor market transition probabilities and mobility indices

The simplest and the most common approach in the labor market transitions literature is estimating transition probabilities over time. The probability of moving across K labor market statuses between year $t-1$ and year t is given by the transition matrix $T_{i,j} = \Pr\{S_t = i | S_{t-1} = j\}$, where $\{i,j\}$ represents employment, unemployment, and inactivity. The higher the degree of labor market mobility or flexibility, the higher the values of the off-diagonal elements of the matrix compared with the diagonal elements. Summary labor market mobility indices use the Shorrocks and Foster method.⁵⁴ The Shorrocks mobility index m , as it is commonly referred to, is given by:

$$m = \frac{K - \text{trace}(T_{i,j})}{K - 1} \quad (1)$$

where K is the number of labor market statuses and $\text{trace}(T_{i,j})$ is the trace of the transition matrix (the sum of the diagonal elements).

One of the cautions to using pseudo-panels is that calculating transition probabilities is not straightforward, since labor market statuses are averaged over individuals within a cohort cell, giving only fractional response variables instead of categorical values from which standard transition probabilities are calculated. To circumvent this challenge, a bootstrap sampling approach is used to maintain the categorical values for randomly selected individuals in the bootstrap sample. The categorical variables indicate individuals' labor market status from which one can easily calculate transition probabilities. In the bootstrap sampling approach, one individual cohort member at a time is

sampled from each cohort-cell, and the transition matrices T_{ij}^r are calculated for bootstrap sample r . The sampling-with-replacement process is repeated R times to obtain a single transition matrix T_{ij} by averaging over the samples: $T_{ij} = 1/R \sum_{r=1}^R T_{ij}^r$. With enough bootstrap samples, T_{ij} is asymptotically close to the transition probability that could be obtained from the cohort-cell averages.

Although informative, and common in the literature, transition matrices and mobility indices have limitations. First, the transition probabilities do not account for individual characteristics that play critical roles in individuals' ability and decisions to move across labor market statuses, such as education, location of residence, age, and gender. Second, the transition probabilities do not provide information on labor markets' flexibility or the degree of labor market segmentation or persistence over time. The next section discusses the econometric approach that addresses such limitations and provides useful labor market mobility parameters.

Econometric method

Labor market transitions are estimated using a dynamic random effects (RE) model following the Papke and Wooldridge panel data method of nonlinear models, which is suitable for fractional response variables.⁵⁵ In a pseudo-panel data setting, the dependent variable is the proportion of individuals in labor market status k in each cohort c and time t . Accordingly, the generic dynamic fractional model can be written as:

$$E(y_{ct} | X_{ct}, y_{ct-1}, \dots, y_{c0}, \alpha_c) = \Phi(\rho y_{ct-1} + X_{ct} \beta + \alpha_c), t=1, \dots, T \quad (2)$$

where $0 \leq y_{ct} \leq 1$ is the fraction of individuals in labor market state k , X_{ct} is a vector of explanatory variables, β and ρ are coefficients to be estimated, α_c is a cohort-specific unobserved heterogeneity term, and $\Phi(\cdot)$ is the standard cumulative distribution (cdf). The primary coefficient of interest is ρ , which captures the labor market's true state dependence, measuring the degree of mobility from one labor market state to another. With fractional

data, the parameter of interest is the Average Partial Effects (APEs) given by:

$$\frac{\partial E(y_{ct}|X_{ct}, y_{ct-1}, \dots, y_{c0}, \alpha_c)}{\partial y_{ct-1}} = \rho \Phi(\rho y_{ct-1} + X_{ct} \beta + \alpha_c) \quad (3)$$

Equation (3) is difficult to identify, because y_{ct-1} and other explanatory variables could be correlated with the unobserved cohort heterogeneity term α_c . In addition, the estimated state dependence coefficient could be inconsistent unless the initial labor market state y_{c0} is observed. As in most cases, the survey dates in the data and each individual's initial labor market condition hardly coincide. As a result, y_{c0} is endogenous and could potentially be correlated with the unobserved cohort-specific effects. These issues are addressed by using the Mundlak approach,⁵⁶ which allows for the unobserved cohort heterogeneity term to be correlated with the explanatory variable as well as the initial condition as:

$$\alpha_c = \Psi + \gamma y_{c0} + \xi \bar{X}_c + e_c \quad (4)$$

where \bar{X}_c is a vector of selected time-variant explanatory variables averaged over survey waves, y_{c0} is the value of the dependent variable in the first available survey wave, and e_c is the error term, which is assumed to be normally distributed, conditional on X_c and y_{c0} (that is, $e_c | \bar{X}_c, y_{c0} \sim N(0, \sigma_e^2)$). Then, the fully parameterized dynamic RE model that accounts for unobserved cohort heterogeneity and initial labor market conditions can be written as:

$$E(y_{ct}|X_{ct}, \bar{X}_c, y_{ct-1}, y_{c0}, \alpha_c) = \Phi(\rho y_{ct-1} + X_{ct} \beta + \Psi + \gamma y_{c0} + \xi \bar{X}_c) \quad (5)$$

The model in equation (5) controls for unobserved heterogeneity and the initial conditions problem. The parameter of interest (ρ) can be consistently estimated from the model. The model in equation (5) estimates the degree of flexibility in entrance to and exit from the labor market, transition between employment and unemployment, mobility between self-employment and wage/salary (formal) employment, and mobility between agricultural and nonagricultural employment.



HUMAN CAPITAL, PRODUCTIVITY, AND STRUCTURAL TRANSFORMATION

Andinet Woldemichael, African Development Bank
and **Abebe Shimeles**, African Development Bank

 @a_woldemichael

This study revisits the role of investment in human capital in closing the productivity gap, boosting labor productivity growth, speeding the rate of structural transformation, and ultimately creating high-quality jobs in Africa. Analysis of detailed sector-level historical data on employment, value added, and human capital shows that investment in human capital is significantly and positively associated with the rate at which countries close the labor productivity gap between agriculture and the rest of the economy. Investment in human capital also significantly increases labor productivity within sectors and the speed at which labor is reallocated from low-productivity to high-productivity employment. In line with other research on this topic, the findings from this study underscore that Africa is ready to benefit significantly from improving human capital through investments in education, health care, and nutrition.


SLOW STRUCTURAL TRANSFORMATION IN AFRICA

The rate of poverty reduction is often synonymous with the rate of structural transformation—the reallocation of economic activities (labor, land, and capital) across the broad sectors of agriculture, manufacturing, and services. This long-term process is at the center of economic development, so much so that the speed at which countries transform their economies is often equated with the pace at which poverty declines.¹ Indeed, it was through this long-term process of shifting economic activities from traditional to modern sectors that today’s advanced economies pulled their populations out of poverty.² One of the channels through which structural transformation improves welfare is through higher employment in

high-productivity sectors. In addition, structural transformation has important implications for labor productivity growth, hours worked, urbanization, and key features of the labor market, such as labor force participation and job polarization.³

Persistent productivity gap between agriculture and nonagriculture sectors

Over the last decade or so, Africa has seen a modest shift in employment from agriculture to high-productivity nonagriculture sectors, particularly to the services sector. However, unlike other emerging economies, such as the fast growing East Asian countries, whose rapid economic growth was realized through export-oriented industrialization, the recent growth in Africa has been driven largely by the boom in commodity prices.⁴ Industrialization has remained immature, and



some countries have even experienced premature de-industrialization. Much of the labor force is still concentrated in the low-productivity agriculture sector, which accounts for about 60 percent of employment in Sub-Saharan Africa. Any shifts in labor from the agriculture sector have been mainly flows into jobs in the also low-productivity informal sector.⁵

The muted structural transformation in Africa, despite the large and persistent labor productivity gap between agriculture and other sectors, is a widely shared concern among development economists. Detailed sector-level data on value-added and employment for 13 African countries show that labor productivity in services and industry sectors was about 2 to 3 times higher than the economy-wide average over 2005–10, while labor productivity in agriculture was only 43 percent of the economy-wide average.⁶ Why does this large labor productivity gap between agriculture and nonagriculture sectors persist in Africa? Why has labor not been moving from low- to high-productivity sectors more rapidly in response to this large productivity gap? And what are the key factors that contribute to the low overall labor productivity growth and the slow pace of labor reallocation? In light of these policy issues, this study revisits the role of investment in human capital in increasing labor productivity growth and structural transformation.

Three strands of the literature offer some explanations for the high productivity gap and the slow pace of structural transformation in Africa. One strand argues that preferences and technologies that generate a reallocation of labor from agriculture to other sectors are the results of growth.⁷ Based on the classical assumption of efficient allocation of labor—with minimal distortions—labor would move from low-productivity to high-productivity sectors in response to productivity differentials. In essence, countries must grow first to see a reallocation of labor from agriculture. A second strand of the literature argues that large productivity gaps persist in Africa because multiple distortions and barriers create inefficiency

in allocating labor across sectors.⁸ The key difference between these two strands is the direction of causality—whether growth precedes the reallocation of labor or whether the reallocation precedes growth—which is more of an empirical matter concerning the efficiency of labor allocation than a philosophical one.

The third strand of the literature explains the persistent gap from a human capital perspective.⁹ Using detailed data from advanced economies (Canada and United States), middle-income economies (Brazil and Mexico), and low-income economies (India and Indonesia), one study decomposed wage (productivity) gaps into the average sectoral human capital of workers and residual wage gaps. Using sector-level estimates of Mincerian returns to education,¹⁰ and controlling for human capital, the analysis showed that the barriers that were considered to be the key reasons for the misallocation of labor accounted for a relatively small part of the wage gap—smaller than previously thought. A larger part of the gap was accounted for by the difference in human capital between low-productivity and high-productivity sectors. Whether this holds for a larger sample of developing countries, particularly in Africa, is the empirical question that this study attempts to answer.

Individual sorting into nonagriculture sectors

However, the literature discussed above and much of the broader growth and structural transformation literature fail to establish causality. As such, it is not clear whether moving workers from agriculture to the modern sectors would increase their productivity by a factor of 2 or 3 and thus also their incomes. A recent study tackled this issue head on.¹¹ Using carefully constructed micro-level panel datasets that followed individuals in Indonesia and Kenya over 30 years, the study found that nearly all (about 90 percent) of the observed productivity gap was attributable to individual self-selection or sorting between sectors. After controlling for individual fixed effects

including abilities, the analysis found that the observed productivity gap between agriculture and the modern sectors is not as large as estimated in previous studies that used national accounts data. And after controlling for education and other factors, the analysis found that in both Indonesia and Kenya people with greater abilities were more likely to move (sort themselves) into urban and non-agriculture sectors.

The policy implications of these findings are consequential. First, the observed productivity gap between agriculture and modern sector using national accounts data could be misleading. Second, the typical wholesale policy prescription that moving labor out of agriculture increases productivity could be wrong, so caution is recommended before deducing that the labor shift would greatly increase productivity or incomes. Rather, policies to increase overall productivity and growth should focus on improving productivity in both agriculture and nonagriculture sectors, such as by improving skills and education.¹²

AIM OF THIS STUDY

This study complements the literature on productivity gaps in Africa by revisiting investment in human capital as the key contributing factor to speedy structural transformation. Using detailed historical data on employment, value added, and human capital in 10 sectors¹³ for 13 African countries,¹⁴ the study analyzes the associations between human capital and the labor productivity gap, economy-wide labor productivity growth, within-sector labor productivity growth, and structural transformation (between-sector productivity growth). These associations, albeit noncausal, provide fresh evidence to policymakers on the nexus between human capital and the jobs crises in Africa. The database provides long-run internationally comparable data on sectoral productivity performance in Africa, Asia, and Latin America (see table A1 in the annex for the full list of countries included in the database).¹⁵

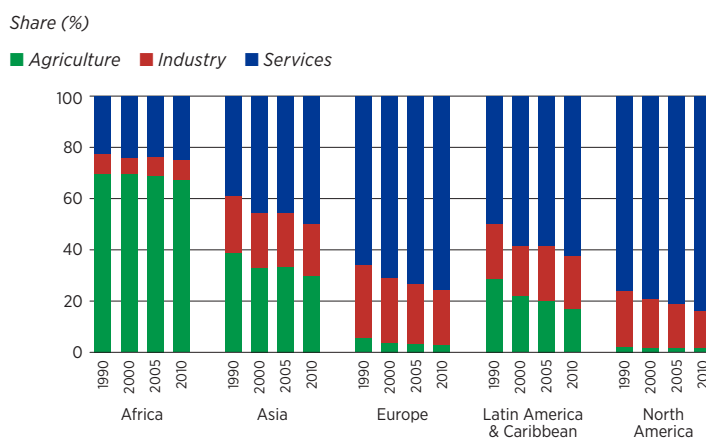
EMPLOYMENT AND PRODUCTIVITY PATTERNS

Sectoral distribution of employment

Employment in Africa has historically been concentrated in the low-productivity agriculture sector (figures 1 and 2). Although agriculture's share in employment has been trending downward—from 66 percent in 1970 to 46 percent in 2010¹⁶—the rate of decline has been sluggish, at just 0.76 percent a year. This is well above agriculture's share in Asia (21 percent) and Latin America (14 percent). Agriculture continues to be the largest employer in Africa.

Two important patterns emerge for African countries. First, the majority of workers who moved out of agriculture moved into the services sector, which has been growing at 2 percent a year. Second, industry's share of employment has been growing at a near-stagnant average annual rate of 0.8 percent over 1970–2010, as the sector absorbed just a small proportion of new labor market entrants and workers exiting agriculture. Industry's share in total value added has been similarly anemic, at just 27 percent in 2010, well below the average of 38 percent in Asia and Latin America. Some countries in Africa have even experienced de-industrialization.

FIGURE 1
Agriculture's share in employment remains higher in Africa than in other regions, 1990, 2000, 2005, and 2010

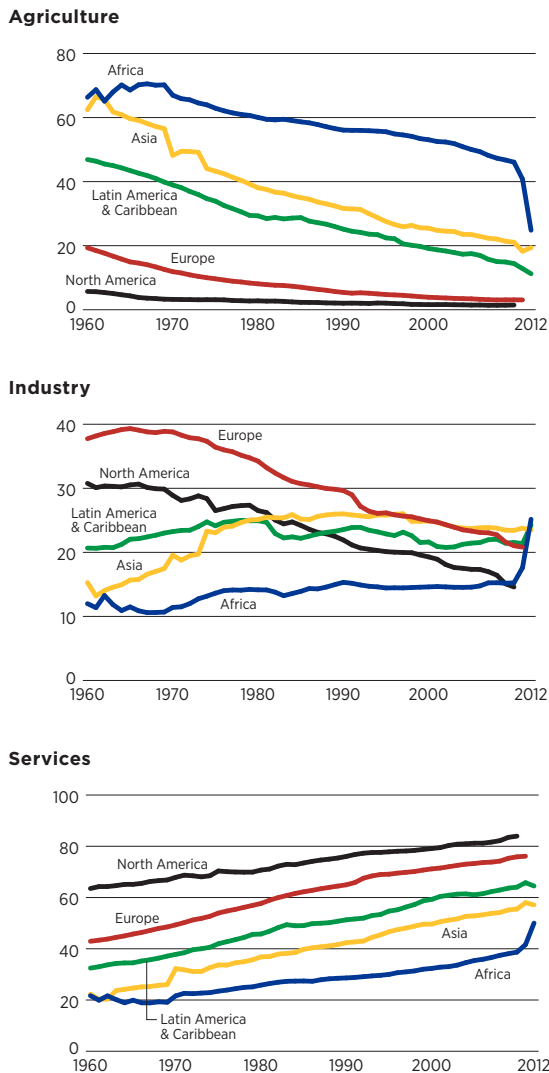


Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

FIGURE 2

Agriculture's share in employment has been declining much more slowly in Africa than in other regions, 1965–2010

Share (%)



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

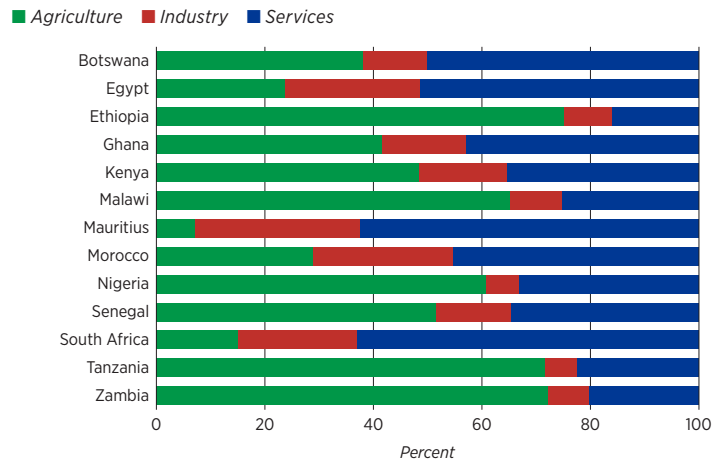
The declining importance of industry began in the aftermath of the policy experiment with structural adjustment programs in the 1980s. Scholars and policymakers are now calling for a renewed push toward industrialization in Africa.

Within these averages, there are considerable differences in the sectoral distribution of employment

FIGURE 3

The sectoral share of employment varies in African countries, though agriculture predominates in most countries, 2010

Share (%)



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

across African countries (figure 3). For most low-income Sub-Saharan African countries in the dataset (Ethiopia, Malawi, Nigeria, Tanzania, and Zambia), agriculture accounted for more than 60 percent of employment in 2010, while industry accounted for less than 10 percent. In contrast, in the more advanced economies of Mauritius and South Africa, the services sector accounted for more than 50 percent of employment, while agriculture's share was below 16 percent in 2010. Industry's share of employment was also substantial, at 30 percent in Mauritius and 21 percent in South Africa in 2010.

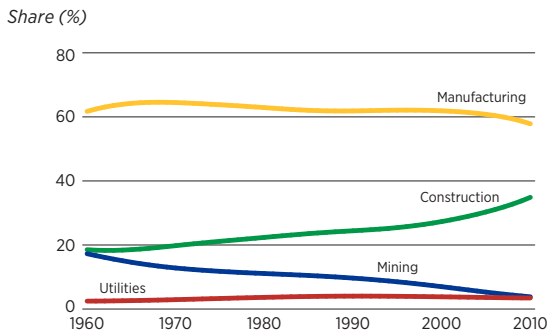
Within-sector distribution of employment

Employment distribution in the nonagriculture sectors reveals important patterns and differences (figures 4 and 5).

Industry sector. Within the industry sector, manufacturing has been the dominant employer, but its relevance has been steadily declining in many parts of Africa. During manufacturing's heyday in the 1960s and 1970s, when most African countries used protectionist policies to support the growth of domestic manufacturing,

FIGURE 4

Within industry, construction employment shares have been rising in Africa while manufacturing shares have been falling, 1960–2010



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
 Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

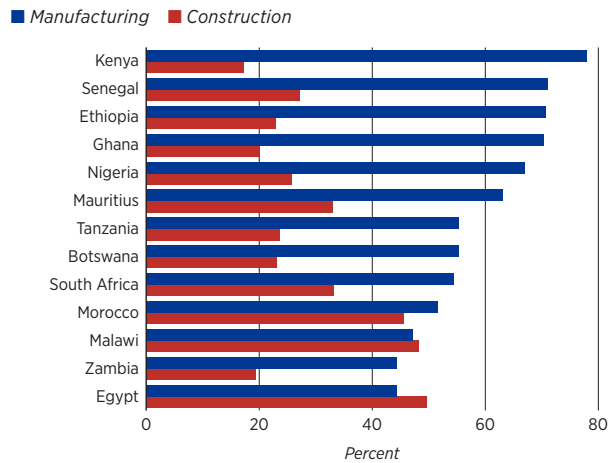
it accounted for about 62 percent of industry employment. The share changed little until the late 1990s, when it started to decline, falling at an average annual rate of 0.46 percent after 2000. By 2010, manufacturing accounted for 59 percent of industry employment. Construction has been the second major employer in the industry sector, with a slightly increasing share of industry sector jobs over time. In 2010, that share was about 30 percent, a sizeable increase compared to the 25 percent average share during the 1990–99 period. The shares of mining and utilities have remained small, together accounting for only 10 percent of industry employment.

There is considerable cross-country variation as well in the distribution of employment in the industry sector in the 13 countries included in the analysis (figure 5). In 2010, the highest share of manufacturing employment in industry employment was in Kenya (77 percent) and the lowest was in Egypt (42 percent). Generally, in half of the countries, two of every three workers in the industry sector were employed in manufacturing. In Egypt and Malawi, however, employment was higher in construction than in manufacturing.

Services sector. Within the services sector, wholesale and retail trade have historically accounted for

FIGURE 5

Manufacturing and construction shares of employment in the industry sector, by African country, 2010

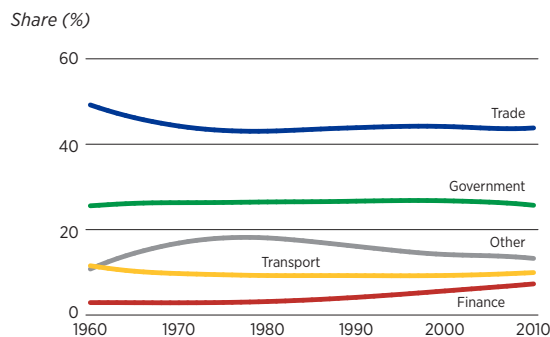


Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
 Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

the bulk of sectoral employment, although much of that activity is in the informal sector. Trade’s share has been rising since the mid-1990s, from below 40 percent to about 46 percent over 2010–13 (figure 6). The government sector (public administration and defense, education, health, and social work) is the second largest employer in the services sector, at 26 percent in 2010, though its share has been declining. The employment shares

FIGURE 6

Trade continues to have the largest employment share within the services sector in Africa, 1960–2010



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
 Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

of other services sectors, including finance, transport, and other services, are small, each at 10 percent or less of services sector employment in 2010.

Within these averages, there are considerable differences across countries in the employment shares of trade and the government sector in total services sector employment (figure 7). Trade is the biggest employer in Ethiopia (64 percent), Senegal (60 percent), Ghana (57 percent), Zambia (52 percent), Malawi (51 percent), and Nigeria (51 percent). Egypt and Morocco stand out for the size of their government sector employment. Nearly one in two Egyptians and Moroccans working in the services sector (and nearly one in four workers overall in Egypt) worked for the government sector in 2012.

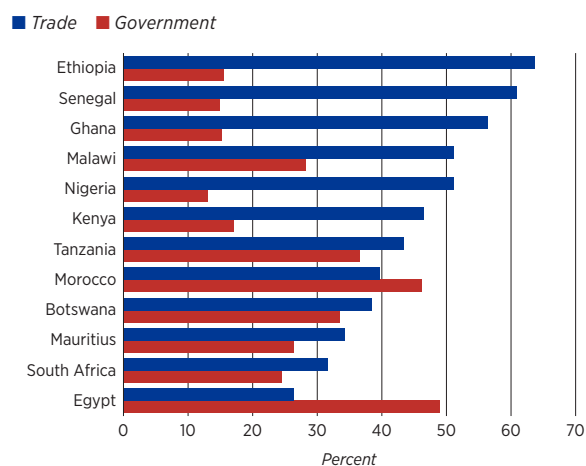
The productivity gap between agriculture and other sectors

Productivity—output per input—is a measure of real compensation for factors used in production—labor, capital, and land. Growth in labor productivity is a key indicator of improvement in welfare as it measures the compensation of labor and, under perfect conditions and wage distribution, real wages.

Labor productivity varies by sector. Agriculture has historically been associated with lower wages, and manufacturing and services with higher wages. In developing countries, the productivity gap between agriculture and other sectors is particularly large and persistent. Development economists argue that a large productivity gap could be an engine of growth: a reallocation of labor from a low-productivity sector to a high-productivity sector could result in economic growth even if within-sector labor productivity remained constant.¹⁷

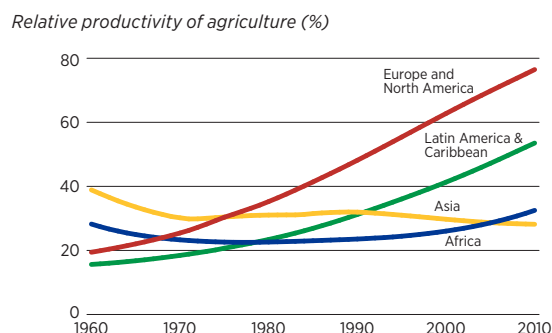
For quite some time, the ratio of the productivity of labor in agriculture to the productivity of labor in nonagriculture sectors (relative productivity of agriculture) has been lower in Africa than in other regions of the world, where agricultural

FIGURE 7
Trade and government sector shares of employment in the services sector, by African country, 2010



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, and Tanzania (excluding Zambia due to missing observation).

FIGURE 8
Trends in the relative productivity of agriculture, by region, 1960–2010



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: The relative productivity of agriculture is the ratio of labor productivity in agriculture to labor productivity in nonagriculture sectors. African countries included in the computation: Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

productivity has improved significantly (figure 8). In 2010, labor productivity in agriculture was 80 percent of that in nonagriculture sectors in Europe and North America, 52.7 percent in Latin America, and 31.2 percent in Africa. This implies that an average agricultural worker in Europe and North America generates 80 percent of the

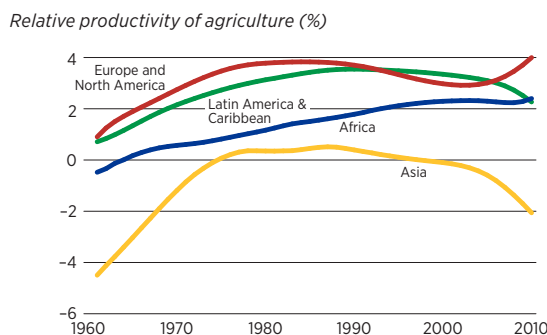
value produced by an average worker in the non-agriculture sectors compared with 31.2 percent in Africa. Only Asia has a lower relative productivity of agriculture than Africa, at 28 percent. Changes in the relative productivity of agriculture can reflect improvements or declines in agriculture or improvements or declines in other sectors—or both.

The productivity gap has remained more or less unchanged for African countries, closing by an average annual rate of only about 1 percent over 1960–2010 (figure 9). The productivity gap even widened for Asia, at a rate of 0.02 percent a year, presumably due to large improvements in non-agriculture sector productivity. These trends are in sharp contrast with the rapid closing of the labor productivity gap in Europe and North America, at 3.35 percent a year.

However, since 2000, the productivity gap in Africa has been narrowing much more rapidly, at more than 2 percent a year, due mainly to improving productivity within the agriculture sector. Though this trend is positive and encouraging, the pace of change is still slow compared with advanced economies. Furthermore, there are large differences across African countries, and the current relative productivity of agriculture is low in many of them (figure 10). For instance, in 2010, the relative productivity of agriculture ranged from 71 percent in Mauritius to 4 percent in Zambia. There were also differences across countries in the trend as well (see figure A1 in the annex). The relative productivity of agriculture has been trending upward in Egypt, Ghana, Kenya, Malawi, and Tanzania and recently in Ethiopia and South Africa, while Nigeria experienced a large decline between the 1960s and 1980s, with a slight rebound since 2000.

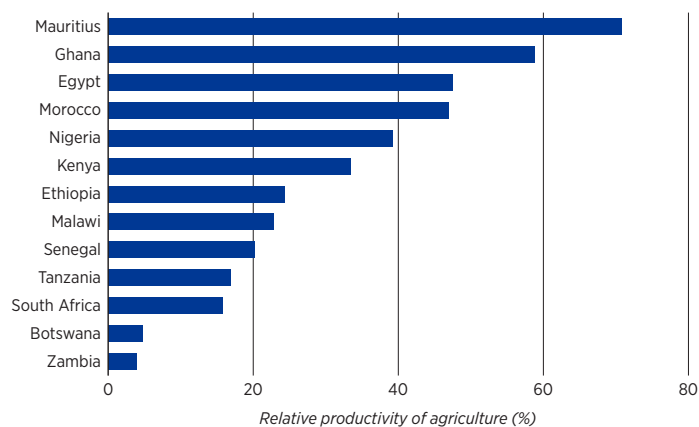
Looking at productivity in the subsectors covered in the data relative to productivity in agriculture (this time with agriculture as the denominator and the other sectors as the numerator) reveals even more dramatic variations in the labor productivity gap (figure 11). Productivity in the mining

FIGURE 9
Percentage change in the relative productivity of agriculture, by region, 1960–2010



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: The relative productivity of agriculture is the ratio of labor productivity in agriculture to labor productivity in nonagriculture sectors. African countries included in the computation: Botswana, Egypt, Ethio-

FIGURE 10
Relative productivity of agriculture, by African country, 2010



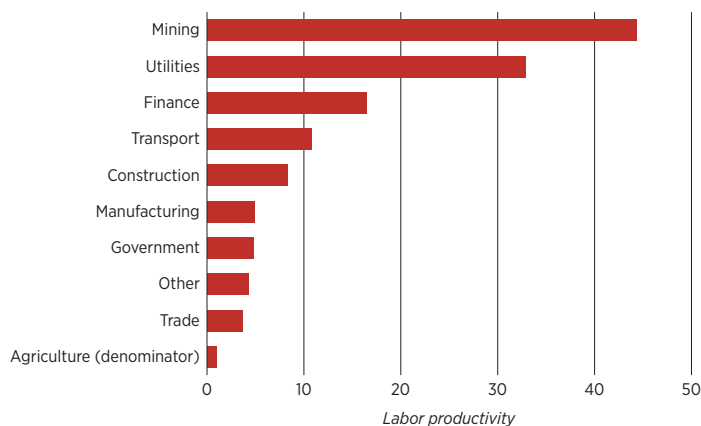
Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
Note: The relative productivity of agriculture is the ratio of labor productivity in agriculture to labor productivity in nonagriculture sectors.

pia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

sector is an astonishing 44.3 times higher than in agriculture, followed by the utilities sector, where productivity is 32.9 times higher. Similarly, labor productivity in the other nonagriculture sectors is much higher than in agriculture: 16.3 times in finance, 10.8 times in transport, 8.3 times in construction, 4.9 times in manufacturing; 4.8 times in the government sector, 4.3 in other sectors, and 3.7 times in trade.

FIGURE 11

Labor productivity of nonagriculture subsectors relative to labor productivity in agriculture, 2010



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
 Note: Computation based on 10 African countries: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, and Tanzania.

SLOW STRUCTURAL TRANSFORMATION AMID PERSISTENT PRODUCTIVITY GAP

This analysis of the productivity gap in Africa raises two questions. Why are such large segments of the labor market in Africa still stuck in the agriculture sector? To what extent does human capital explain the slow pace of labor movement from low-productivity to high-productivity sectors?

Economy-wide labor productivity growth

This section delves deeper to assess the speed of structural transformation in Africa. The standard approach is to decompose economy-wide labor productivity growth into two components: within-sector labor productivity growth and between-sector labor productivity growth (due to the movement of labor from low-productivity to high-productivity sectors, or structural transformation). Economy-wide labor productivity growth can be decomposed as follows:¹⁸

$$\Delta y^t = \sum_i \theta_i^{t-k} \Delta y_i^t + \sum_i y_i^t \Delta \theta_i^t \quad (1)$$

where y^t denotes economy-wide productivity, y_i^t denotes sectoral productivity levels, and θ_i^t

is the share of employment in sector i . The first term on the right side of the equation measures the within-sector productivity growth, and the second term measures the productivity effect of reallocating labor between sectors (structural transformation). The decomposition results are displayed in table 1 and in figure A3 in the annex).

Between 1960 and 2010, average economy-wide labor productivity in the 12 African countries in the dataset grew by 1.1 percent annually. Labor productivity grew faster than average in the period right after independence (1960–74), at an average annual rate of 1.2 percent. However, in the following period (1975–90), when much of the continent experienced the disruption of civil wars and political instability, productivity growth slowed to an average of 0.3 percent annually and was even negative for many African countries. Not until the early 2000s did productivity growth start to pick up again. Since 2000, it has grown at an average rate of 2.2 percent annually.

More than half (56 percent) of the growth in economy-wide labor productivity over 1960–2010 was due to within-sector productivity growth, which grew at 0.6 percent annually. But the rate varied considerably over the period. Reflecting the overall economic and political instability during 1975–90, within-sector productivity growth declined at 0.15 percent annually. During 2000–10, labor productivity growth rebounded, and within-sector productivity grew at an average annual rate of 1.6 percent, which accounted for 73 percent of the growth in economy-wide labor productivity. Thus, despite the faster economy-wide labor productivity growth in 2000–10, the contribution of structural change to productivity growth was small and even declined, underscoring the deep concern of policymakers about the lack of the type of high-quality job creation that usually accompanies rapid economic growth.

Botswana, Egypt, Ethiopia, Mauritius, Nigeria, South Africa, and Zambia broadly followed this pattern, with within-sector productivity growth

TABLE 1
Decomposition of annual labor productivity growth, by country and period, 1960–2010

Country	1960–2010			1960–75			1975–90			2000–10 (or latest)		
	Overall	Within-sector	Between sectors	Overall	Within-sector	Between sectors	Overall	Within-sector	Between sectors	Overall	Within-sector	Between sectors
Botswana	2.94	1.7	1.24	2.63	0.91	1.72	3.77	1.34	2.43	2.38	2.23	0.15
Egypt	2.67	2.02	0.65	2.04	1.56	0.47	4.47	3.56	0.91	3.14	2.43	0.7
Ethiopia	-0.26	-0.32	0.06	-0.56	-0.43	-0.13	-1.63	-1.59	-0.03	2.07	1.63	0.44
Ghana	0.45	0.12	0.33	-0.61	-0.83	0.22	-1.31	-1.33	0.03	2.2	1.07	1.14
Kenya	-0.04	-0.71	0.67	0.22	0.16	0.06	-0.02	-0.44	0.42	0.71	-0.02	0.73
Mauritius	4.36	3.42	0.93	7.35	6.09	1.26	2.8	2	0.8	4.94	4.18	0.76
Malawi	0.03	-0.31	0.34	-0.37	-0.31	-0.06	-0.55	-0.49	-0.06	0.6	-0.61	1.21
Nigeria	0.9	0.96	-0.07	1.67	1.49	0.18	-1.04	-1.48	0.44	2.88	2.98	-0.11
Senegal	-0.56	-1.19	0.63	-1.28	-1.49	0.21	-1.78	-2.31	0.53	0.76	-0.12	0.88
South Africa	1.95	0.96	0.99	3.73	2.09	1.65	0.05	-1.03	1.08	3.72	3.4	0.32
Tanzania	0.38	0.09	0.3	0.18	0.12	0.07	0.03	-0.16	0.19	1.21	0.34	0.87
Zambia	0.18	0.44	-0.26	-0.73	-0.45	-0.28	-0.8	0.09	-0.89	1.85	1.76	0.09
Average	1.08	0.6	0.48	1.19	0.74	0.45	0.33	-0.15	0.49	2.21	1.61	0.6

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
 Note: Unweighted averages; values might not sum to totals because of rounding.

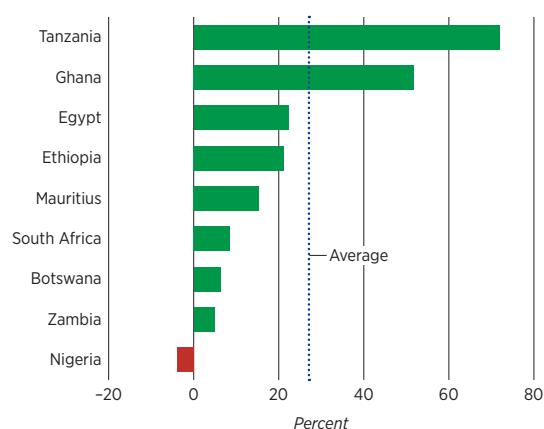
accounting for much of the growth in economy-wide labor productivity during 2000–13. For instance, in Mauritius, which has had the highest growth in Africa, at 4.9 percent a year, structural transformation contributed just 15.4 percent to economy-wide labor productivity growth (figure 12). However, in Ghana, Kenya, Malawi, Senegal, and Tanzania, economy-wide labor productivity growth was more modest and was accounted for primarily by structural change. Tanzania and Nigeria are at the extreme ends of the distribution, with contributions of structural change to overall labor productivity growth of 71.9 percent and -3.8 percent, respectively. This heterogeneity across countries arises from different factors, including weather patterns that adversely affected agriculture, geography, macroeconomic conditions, and other country specific factors.

Labor productivity growth in services and industry sectors

The same decomposition equation as for economy-wide productivity growth was also used to decompose productivity growth separately for the services and industry sectors (figure 13).

FIGURE 12

The contribution of structural change to economy-wide labor productivity growth varied considerably by country but was low in most countries, 2000–10



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).
 Note: Kenya, Malawi, and Senegal are not shown in the figure because their within-sector productivity growth was negative during the period, which would show a contribution of structural change of more than 100 percent. Moreover, the economy-wide productivity growth for these countries was below 1 percent a year.

Since 2000, a large part of labor productivity growth in the services sector in Botswana, Egypt, Mauritius, Nigeria, and South Africa was driven by within-sector labor productivity growth rather

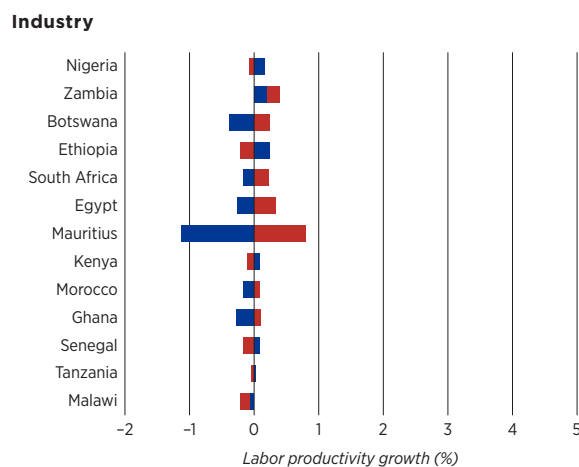
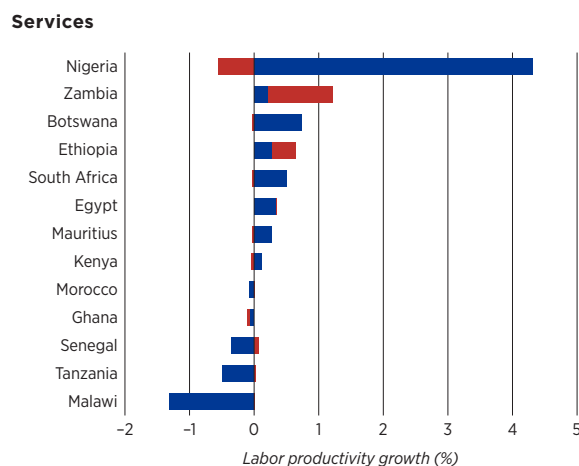
than by the reallocation of labor across subsectors, for example, from trade to transport. Mirroring the economy-wide decline in labor productivity growth during the period, within-sector labor productivity growth in the services sector was negative. Furthermore, the reallocation of labor between subsectors of the services sector contributed very little to labor productivity growth in the sector in most of the countries in the study (see figure 13).

Three countries stood out, however: Ethiopia, Nigeria, and Zambia. In Nigeria, the reallocation of labor from low-productivity to high-productivity

services subsectors contributed negatively to the broader services sector labor productivity growth. This is in line with the between-sector contribution to economy-wide labor productivity growth in Nigeria (see table 1), reflecting a much deeper structural issue on the allocation of labor and other resource within the economy. In contrast, in Ethiopia and Zambia, the reallocation of labor between subsectors of the services sector contributed positively to overall services sector labor productivity growth. This shows that there is room for realizing productivity gains simply by reallocating labor from one services subsector to another.

FIGURE 13
Labor productivity growth decomposition in the services and industry sectors, 2000–10

■ Between sectors ■ Within sector



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).

Industry sector labor productivity growth was very small throughout the decade (see figure 13). However, the contributions of the two components of labor productivity growth to overall labor productivity growth in the sector varied across countries. The reallocation of labor between subsectors (structural transformation) contributed negatively to labor productivity growth in the industry sector in Mauritius, Egypt, Botswana, South Africa, Ghana, and Morocco, countries in which industry's economic importance declined or stagnated over 2000–10 (see figure A4 in the annex). The opposite is true for Ethiopia, Senegal, Nigeria, and Zambia, where the importance of the industry sector has been increasing.

THE ROLE OF HUMAN CAPITAL

The importance of human capital in economic growth and structural transformation is well documented.¹⁹ Conditional on the initial level of development (GDP), human capital accelerates economic growth through at least two channels: it facilitates the absorption of technologies, and unlike physical capital, it is difficult to destroy. Higher levels of human capital enable countries to absorb new technologies from leading countries faster and more easily, it augments or complements the existing factors of production, and facilitates innovation. And because human capital is more or less indestructible, even countries whose physical capital has been destroyed through war

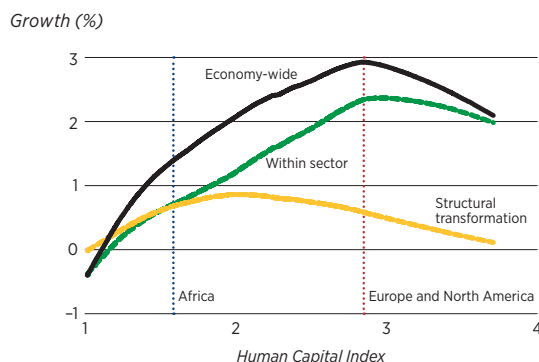
and natural causes, such as tsunamis, tend to grow much faster than those with lower levels of human capital.²⁰ An example is Germany after the Second World War: because of its wealth of human capital, Germany was able to rebuild its economy out of ruins in less than a generation.

Growth of human capital in Africa is associated with structural transformation

In Africa, too, human capital²¹ exhibits a positive relationship with average annual growth in labor productivity (figure 14), revealing promise for speeding the pace of structural transformation and thus the pace of high-productivity job creation. But the magnitude of the correlation decreases after a certain level. Human capital is also positively correlated with both within-sector and between-sector (structural transformation) labor productivity growth. This implies that countries that started off with lower levels of human capital have more scope to accelerate labor productivity growth, including structural transformation, by increasing human capital through investments in education, health, and nutrition. However, for more advanced economies, which have already passed through the early stages of development, the role of human capital in structural transformation appears to be marginal. For example, the contribution of human capital to economy-wide and within-sector labor productivity growth starts to decline beyond a Human Capital Index of 3, which is the average value for Europe and North America.

But for countries with low human capital (an index value below 3), the correlation between human capital and economy-wide labor productivity growth—primarily through a positive contribution to within-sector labor productivity growth—is high and positive. Human capital also contributes to structural transformation, but the inflection point beyond which its contribution begins to decline is lower, at around an average index value of 2. The pooled average was around 2 in 2010 for the 12 countries included in the analysis; of these countries, Ethiopia, Malawi, Nigeria, Senegal, and Tanzania had an index value of less than 2. That implies

FIGURE 14
The relationship between labor productivity growth and human capital



Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer (2015)).

Note: The Human Capital Index is a calculated index of human capital per person, based on years of schooling (Barro and Lee 2012) and returns to education (Psacharopoulos 1994). Human capital per worker does not have a natural unit. The value of human capital index in the PWT9.0 ranges between 1 and 3.7.

that there is considerable scope to speed the pace of labor productivity growth and structural transformation through investments in human capital. Although the level of human capital in Africa is far behind that in other regions, the trend is upward. And again, there is wide variation across countries, with Botswana far advanced and Ethiopia trailing (see figures A5 and A6 in the annex).

A deeper assessment of the role of human capital growth

To further inform the assessment of positive correlations between human capital and economy-wide labor productivity growth and structural transformation, a simple ordinary least squares regression was run on a pooled cross-country sample of 41 countries over 1970–2010 to determine the extent to which human capital explains the observed productivity gap between agriculture and nonagriculture sectors (tables 2a and 2b).²² Similar regressions were run for economy-wide labor productivity growth, within-sector labor productivity growth, and the rate of structural transformation (all derived from equation 1; tables 3–5). The regressions controlled for the initial levels of human capital and GDP using 1960s averages. Year and

regional dummy variables were included to control for time and geographic factors that vary by region, and region-year interaction terms were included to factor out region-specific time-varying factors.

Human capital significantly increases growth in the relative productivity of agriculture (ratio of the productivity of labor in agriculture to the productivity of labor in nonagriculture sectors) over 1970–2010, indicating a reduction in the labor productivity gap between agriculture and the other sectors (see table 2a). After initial human capital, initial GDP, region, year, and region-specific time

effects are controlled for in specification 6, the coefficient implies that a 1 percentage point increase in the growth of human capital increases growth in the relative productivity of agriculture by 0.73 percentage point. However, the coefficients on region-specific estimations show that the relationship between human capital growth and growth in the relative productivity of agriculture for African countries is positive but statistically insignificant (see table 2b).

The evidence is quite strong on the positive contribution of human capital to economy-wide labor

TABLE 2A

Simple ordinary least squares regression of growth in relative productivity of agriculture, pooled sample, 1970–2010

Variable	Specification 1	Specification 2	Specification 3	Specification 4	Specification 5	Specification 6
Growth in human capital	0.226 (0.338)	0.560 (0.355)	0.520 (0.357)	0.783** (0.362)	0.725* (0.388)	0.725* (0.388)
Observations	1,642	1,642	1,642	1,642	1,642	1,642
R-squared	0.000	0.006	0.010	0.022	0.157	0.157
Initial human capital		✓	✓	✓	✓	✓
Initial GDP			✓	✓	✓	✓
Region				✓	✓	✓
Year					✓	✓
Region-year interaction						✓

** $p \leq 0.05$; * $p \leq 0.1$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors. The relative productivity of agriculture is the ratio of labor productivity in agriculture to labor productivity in nonagriculture sectors.

TABLE 2B

Simple ordinary least squares regression of growth in relative productivity of agriculture, by region, 1970–2010

Variable	Developing country regions			Europe and North America
	Africa	Asia	Latin America	
Growth in human capital	0.896 (0.688)	-0.0226 (0.699)	1.349* (0.725)	-0.282 (2.546)
Observations	499	446	376	321
R-squared	0.102	0.130	0.106	0.180
Initial human capital	✓	✓	✓	✓
Initial GDP	✓	✓	✓	✓
Year	✓	✓	✓	✓

* $p \leq 0.1$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors. The relative productivity of agriculture is the ratio of labor productivity in agriculture to labor productivity in nonagriculture sectors.

TABLE 3A**Simple ordinary least squares regression of economy-wide labor productivity growth, pooled sample, 1970–2010**

Variable	Specification 1	Specification 2	Specification 3	Specification 4	Specification 5	Specification 6
Growth in human capital	0.200 (0.150)	0.501*** (0.157)	0.501*** (0.154)	0.284* (0.154)	0.366** (0.157)	0.366** (0.157)
Observations	1,660	1,660	1,660	1,660	1,660	1,660
R-squared	0.001	0.022	0.061	0.104	0.305	0.305
Initial human capital		✓	✓	✓	✓	✓
Initial GDP			✓	✓	✓	✓
Region				✓	✓	✓
Year					✓	✓
Region-year interaction						✓

*** $p \leq 0.01$; ** $p \leq 0.05$; * $p \leq 0.1$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors.

TABLE 3B**Simple ordinary least squares regression of economy-wide labor productivity growth, by region, 1970–2010**

Variable	Developing country region			Europe & North America
	Africa	Asia	Latin America	
Growth in human capital	0.896*** (0.224)	0.435 (0.321)	-1.156*** (0.362)	-0.756 (0.806)
Observations	499	448	378	335
R-squared	0.152	0.232	0.355	0.322
Initial human capital	✓	✓	✓	✓
Initial GDP	✓	✓	✓	✓
Year	✓	✓	✓	✓

*** $p \leq 0.01$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors.

productivity. A 1 percentage point increase in human capital growth leads to a 0.37 percentage point increase in growth in economy-wide labor productivity (table 3a). The relationship is even stronger for African countries, with a 1 percentage point increase in human capital growth leading to a 0.9 percentage point increase in economy-wide labor productivity growth (table 3b). As in the relationship shown in figure 13, human capital growth appears not to be associated with economy-wide labor productivity in Asia or Europe and North America, while contributing negatively in Latin America.

There is no statistically significant relationship between human capital growth and within-sector labor productivity for the pooled sample (table 4a). However, when the model is run by region, human capital growth is found to be significantly and positively associated with within-sector productivity growth in Africa but not in other regions (table 4b). A 1 percentage point increase in the growth of human capital is associated with a 0.65 percentage point increase in within-sector labor productivity growth in Africa.

After controlling for initial human capital levels, initial GDP, region, year, and region-year

TABLE 4A

Simple ordinary least squares regression of within-sector labor productivity growth, pooled sample, 1970–2010

Variable	Specification 1	Specification 2	Specification 3	Specification 4	Specification 5	Specification 6
Growth in human capital	0.0727 (0.148)	0.387** (0.155)	0.403*** (0.154)	0.194 (0.153)	0.257 (0.157)	0.257 (0.157)
Observations	1,660	1,660	1,660	1,660	1,660	1,660
R-squared	0.000	0.023	0.054	0.103	0.283	0.283
Initial human capital		✓	✓	✓	✓	✓
Initial GDP			✓	✓	✓	✓
Region				✓	✓	✓
Year					✓	✓
Region-year interaction						✓

*** $p \leq 0.01$; ** $p \leq 0.05$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors.

TABLE 4B

Simple ordinary least squares regression of with sector labor productivity growth, by region, 1970–2010

Variable	Developing country region			
	Africa	Asia	Latin America	Europe & North America
Growth in human capital	0.648*** (0.224)	0.479 (0.318)	-1.138*** (0.376)	-0.641 (0.788)
Observations	499	448	378	335
R-squared	0.131	0.221	0.315	0.318
Initial human capital	✓	✓	✓	✓
Initial GDP	✓	✓	✓	✓
Year	✓	✓	✓	✓

*** $p \leq 0.01$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors.

interaction terms (specification 6), the pooled regressions show that a 1 percentage point increase in human capital growth is associated with a 0.11 percentage point increase in the rate of structural transformation (table 5a). What is striking is that this positive and statistically significant association is driven primarily by African countries. The coefficient is positive and statistically significant only for African countries; it is negative and not significant for other regions (table 5b). In Africa, a 1 percentage point increase in human capital growth is associated with a 0.25 percentage point increase in the rate of structural transformation.

Policy implications: Increasing investments in human capital

Africa's buoyant economic growth over the past decade and a half failed to be accompanied by the robust creation of good quality jobs. Although there has been a modest shift in employment from agriculture to nonagriculture sectors, the shift has been mainly to jobs in the low-productivity informal sector. The slow rate of structural transformation—despite the wide and persistent productivity gaps between agriculture and other sectors—has long been seen as a manifestation of a fundamental and structural jobs problem. Unemployment,

TABLE 5A**Simple ordinary least squares regression of rate of structural transformation, pooled sample, 1970–2010**

Variable	Specification 1	Specification 2	Specification 3	Specification 4	Specification 5	Specification 6
Growth in human capital	0.128*** (0.0446)	0.114** (0.0471)	0.0980** (0.0471)	0.0896* (0.0478)	0.109** (0.0512)	0.109** (0.0512)
Observations	1,660	1,660	1,660	1,660	1,660	1,660
R-squared	0.005	0.005	0.019	0.030	0.162	0.162
Initial human capital		✓	✓	✓	✓	✓
Initial GDP			✓	✓	✓	✓
Region				✓	✓	✓
Year					✓	✓
Region-year interaction						✓

*** $p \leq 0.01$; ** $p \leq 0.05$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors.

TABLE 5B**Simple ordinary least squares regression of rate of structural transformation, by region, 1970–2010**

Variable	Developing country region			
	Africa	Asia	Latin America	Europe & North America
Growth in human capital	0.248*** (0.0668)	-0.0447 (0.102)	-0.0176 (0.148)	-0.116 (0.110)
Observations	499	448	378	335
R-squared	0.117	0.164	0.180	0.516
Initial human capital	✓	✓	✓	✓
Initial GDP	✓	✓	✓	✓
Year	✓	✓	✓	✓

*** $p \leq 0.01$.

Source: Calculation based on Groningen Growth and Development Centre 10-Sector Database on sector-level employment and value added (Timmer, de Vries, and de Vries 2015) and Penn World Table 9.0 data on human capital (Feenstra, Inklaar, and Timmer 2015).

Note: Numbers in parentheses are standard errors.

underemployment, and informality have taken deep root as decent job opportunities remain elusive, especially for the increasingly large youth population in Africa. With the enormous pressure that impending demographic change will bring to African labor markets, the jobs problem will become not just an economic issue but also a social and political issue, threatening the political and social stability of the continent.

Building on previous research, this study found that, despite some shift of employment into non-agriculture sectors, most notably since 2000, the gap in productivity persists—and not only between the agriculture on the one hand and services

and industry on the other, but also within these sectors. However, there is considerable variation across African countries in the patterns and distribution of employment and labor productivity.

Important for policy, the level and growth in human capital in countries are significantly associated with how fast countries close their productivity gaps. Furthermore, human capital is the main driver of both productivity growth within sectors and the pace of structural transformation in Africa. In line with the findings in the literature, the implication of this study is that human capital is the fundamental factor behind structural transformation of the economy and

the creation of decent job opportunities. Africa is particularly well positioned to reap large benefits in labor productivity growth and accelerated structural transformation from investing in human capital by improving education, health, and nutrition. Africa should seize the opportunity.

NOTES

1. Duernecker and Herrendorf 2016; Herrendorf, Rogerson, and Valentinyi 2013; McMillan, Rodrik, and Verduzco-Gallo 2014.
2. McMillan, Rodrik, and Verduzco-Gallo 2014.
3. Petrongolo and Ngai 2017; Duernecker and Herrendorf 2015.
4. Diao, McMillan, and Rodrik 2017.
5. Diao, McMillan, and Rodrik 2017; McMillan, Rodrik, and Verduzco-Gallo 2014.
6. Timmer, de Vries, and de Vries (2015), using data from the Groningen Growth and Development Centre.
7. Herrendorf, Rogerson, and Valentinyi 2013.
8. Caselli 2005; Restuccia, Yang, and Zhu 2008.
9. Herrendorf and Schoellman 2015.
10. Mincer 1974.
11. Hicks et al. 2017.
12. de La Fuente 2011; Herrendorf and Schoellman 2015; Hicks et al. 2017.
13. 1) Agriculture includes agriculture, hunting and forestry, fishing; 2) mining includes mining and quarrying; 3) manufacturing; 4) utilities includes electricity, gas, and water supply; 5) construction; 6) trade services includes wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods, hotels and restaurants; 7) transport includes transport services, storage and communications; 8) finance includes financial intermediation, renting and business activities (excluding owner occupied rents); 9) government services includes public administration and defence, education, health and social work; and 10) others include personal services, community, social and personal service activities, activities of private households.
14. The data are from the Groningen Growth and Development Centre (Timmer, de Vries, and de Vries 2015) and the Penn World Table 9.0 (Feenstra, Inklaar, and

Timmer 2015). The African countries included are Botswana, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

15. More information could be found online at <https://www.rug.nl/ggdc/productivity/10-sector/>.
16. While this study generally refers to 2010 as the end date for data series, the date is meant to stand in for the latest year for which data are available. The actual date may vary for some countries depending on availability of data. See table A1 for the full list of countries and periods for which data is available.
17. McMillan, Rodrik, and Verduzco-Gallo 2014.
18. This decomposition follows McMillan and Rodrik (2011).
19. Among many other studies, see Acemoglu, Gallego, and Robinson 2014; Herrendorf, Rogerson, and Valentinyi 2013; Diao and Rodrik 2017; Barro 2001.
20. Barro 2001.
21. The data on the human capital index are obtained from the Penn World Table 9.0 (Feenstra, Inklaar, and Timmer 2015), which was derived from average years of schooling and returns to education (available at https://www.rug.nl/ggdc/docs/human_capital_in_pwt_90.pdf).
22. Data on human capital are from Penn World Table 9.0 (Feenstra, Inklaar, and Timmer 2015); other data are from the Groningen Growth and Development Centre 10-Sector Database (Timmer, de Vries, and de Vries 2015).

REFERENCES

- Acemoglu, D., F.A. Gallego, and J.A. Robinson. 2014. "Institutions, Human Capital, and Development." *Annual Review of Economics* 6 (1): 875–912.
- Barro, R. 2001. "Human Capital and Growth." *American Economic Review* 91 (2): 12–17.
- Barro, R., and J. Lee. 2013. "A New Data Set of Educational Attainment in the World, 1950–2010." *Journal of Development Economics* 104: 184–98.
- Caselli, F. 2005. "Accounting for Cross-Country Income Differences." In *Handbook of Economic Growth, Volume 2*, ed. P. Aghion and S.N. Durlauf. Amsterdam, Netherlands: Elsevier.

- de La Fuente, A. 2011. "Human Capital and Productivity." *Nordic Economic Policy Review* 2 (2): 103–132.
- Diao, X., M. McMillan, and D. Rodrik. 2017. "The Recent Growth Boom in Developing Economies: A Structural-Change Perspective." Harvard University Research Paper. Cambridge, MA.
- Duernecker, G., and B. Herrendorf. 2015. "On the Allocation of Time: A Quantitative Analysis of the US and France." CESifo Working Paper Series No. 5475, Center for Economic Studies, Munich, Germany.
- Feenstra, R., R. Inklaar, and M. Timmer. 2015. "The Next Generation of the Penn World Table." *American Economic Review* 105 (10): 3150–3182. Available at: <http://www.ggdc.net/pwt>.
- . 2016. "Structural Transformation of Occupation Employment." Working paper, February.
- Herrendorf, B., and T. Schoellman. 2015. "Wages, Human Capital, and Structural Transformation." Tempe, AZ: Arizona State University.
- Herrendorf, B., R. Rogerson, and A. Valentinyi. 2013. "Growth and Structural Transformation." In P. Aghion and S.N. Durlauf (Eds.), *Handbook of Economic Growth, Volume 2*. Amsterdam, Netherlands: Elsevier.
- Hicks, J.H., M. Kleemans, N.Y. Li, and E. Miguel. 2017. "Reevaluating Agricultural Productivity Gaps with Longitudinal Microdata." National Bureau of Economic Research (NBER) Working Paper No. 23253. Cambridge, MA.
- McMillan, M., and D. Rodrik. 2011. "Globalization, Structural Change, and Productivity Growth." National Bureau of Economic Research (NBER) Working Paper No. 17143. Cambridge, MA.
- McMillan, M., D. Rodrik, and Í. Verduzco-Gallo. 2014. "Globalization, Structural Change, and Productivity Growth, with an Update on Africa." *World Development* 63: 11–32.
- Mincer, J. A. 1974. "Schooling and earnings." In *Schooling, Experience, and Earnings* (pp. 41–63). Cambridge, MA: National Bureau of Economic Research.
- Petrongolo, B., and L. R. Ngai. 2017. "Gender Gaps and the Rise of the Service Economy." *American Economic Journal: Macroeconomics* 9 (4): 1–44.
- Psacharopoulos, G. 1994. "Returns to Investment in Education: A Global Update." *World Development* 22 (9): 1325–1343.
- Restuccia, D., D. Yang, and X. Zhu. 2008. "Agriculture and Aggregate Productivity: A Quantitative Cross-Country Analysis." *Journal of Monetary Economics* 55 (2): 234–250.
- Timmer, M.P., G.J. de Vries, and K. de Vries. 2015. "Patterns of Structural Change in Developing Countries." In *Routledge Handbook of Industry and Development*, ed. J. Weiss and M. Tribe. Abingdon, UK: Routledge.

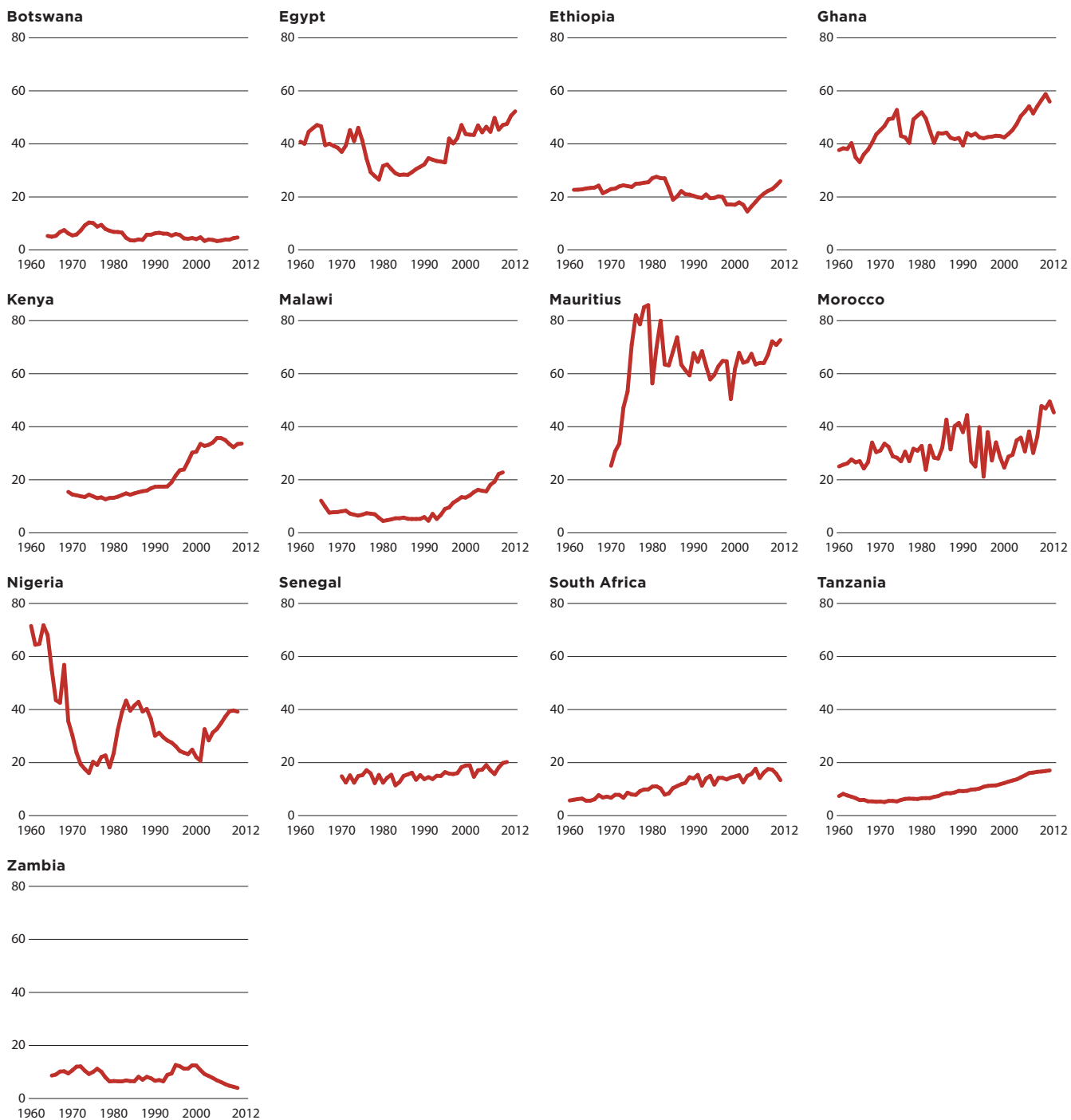
ANNEX

ADDITIONAL TABLES AND FIGURES

FIGURE A1

Labor productivity in agriculture relative to nonagriculture sectors, 1960–2010

Relative productivity of agriculture (%)

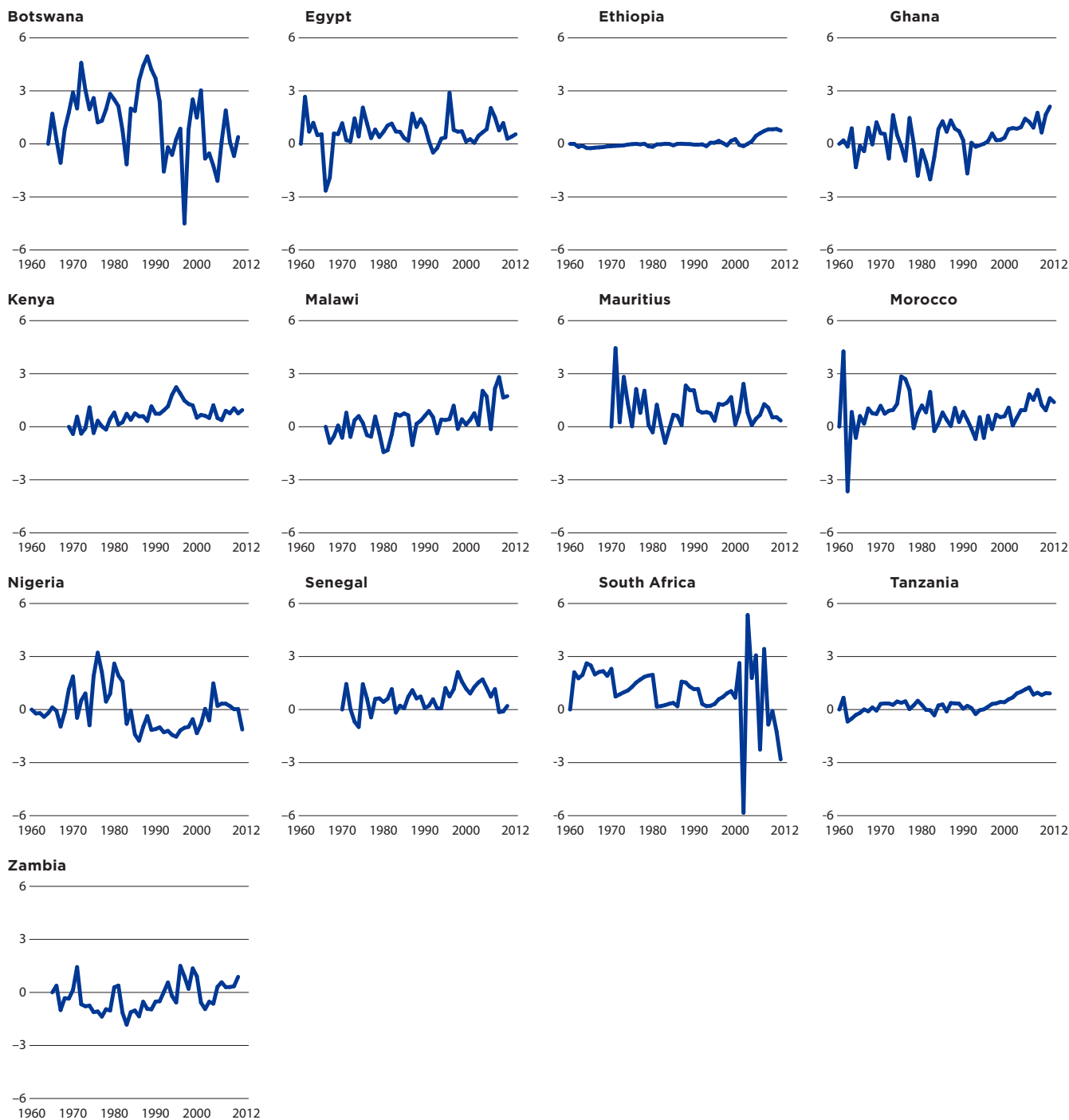


Source: Calculations based on Groningen Growth and Development Center 10-sector data.

FIGURE A2

Trends in average annual economy-wide labor productivity growth due to structural transformation, 1960–2010

Percent

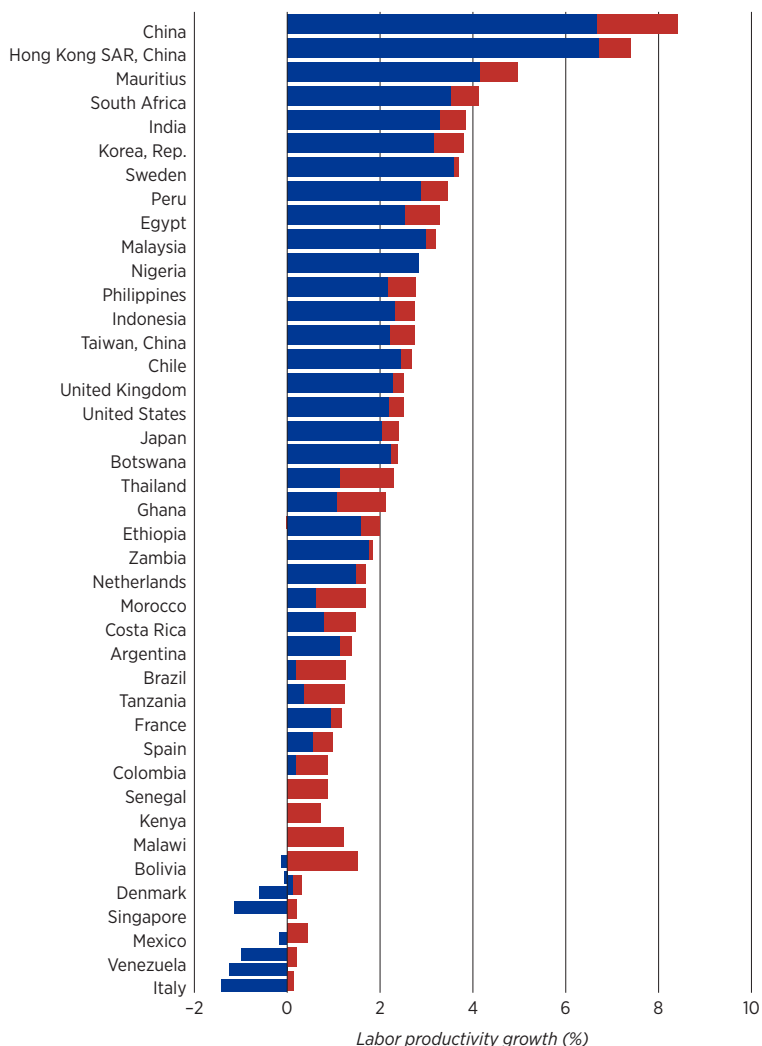


Source: Calculations based on Groningen Growth and Development Center 10-sector data.

FIGURE A3

Average labor productivity growth decomposition, by country, 2000-10

■ Within ■ Between



Source: Calculations based on Groningen Growth and Development Center 10-sector data.

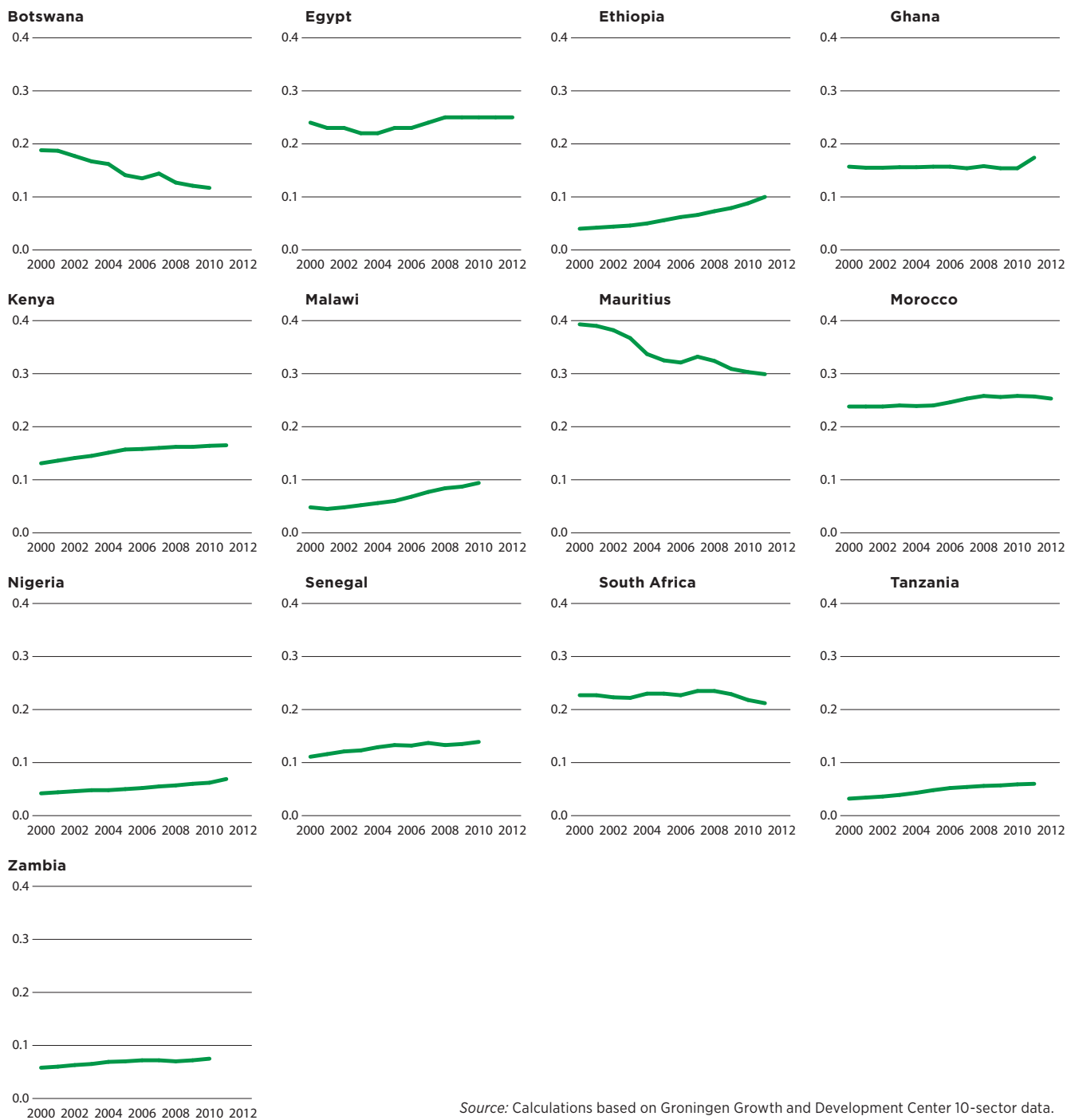
TABLE A1

Full list of countries in the GGDC Database

Country	Start	End
Argentina	1960	2011
Bolivia	1960	2010
Botswana	1964	2010
Brazil	1960	2011
Chile	1960	2012
China	1960	2011
China, Hong Kong SAR	1974	2011
Colombia	1960	2010
Costa Rica	1960	2011
Denmark	1960	2011
Egypt	1960	2012
Ethiopia	1961	2011
France	1960	2011
Ghana	1960	2011
India	1960	2010
Indonesia	1975	2012
Italy	1960	2011
Japan	1960	2012
Kenya	1969	2011
Korea, Rep.	1963	2010
Malawi	1966	2010
Malaysia	1975	2011
Mauritius	1970	2011
Mexico	1960	2012
Morocco	1960	2012
Netherlands	1960	2011
Nigeria	1960	2011
Peru	1960	2011
Philippines	1971	2012
Senegal	1970	2010
Singapore	1970	2011
South Africa	1960	2011
Spain	1960	2011
Sweden	1960	2011
Taiwan	1963	2012
Tanzania	1960	2011
Thailand	1960	2011
United Kingdom	1960	2011
United States	1960	2010
Venezuela	1960	2011
Zambia	1965	2010

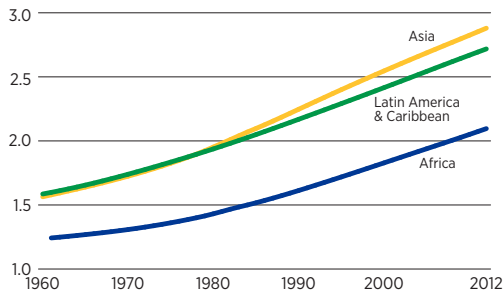
FIGURE A4
Trends in the share of industry in total employment, 2000-10

Ratio



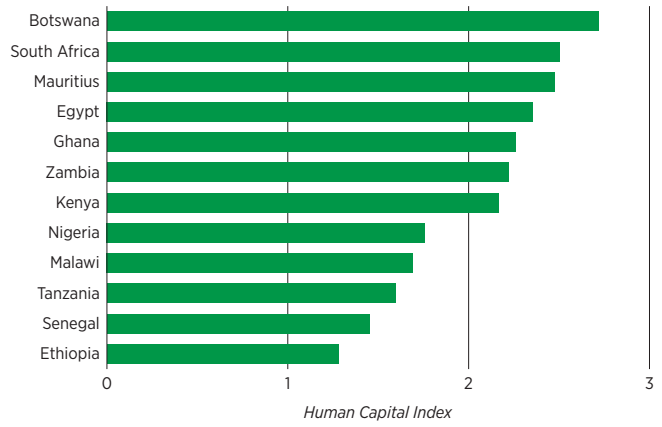
Source: Calculations based on Groningen Growth and Development Center 10-sector data.

FIGURE A5
Trends in the Human Capital Index, 1960–2010



Source: Calculations based on data from Penn World Table 9.0.
 Note: The Human Capital Index is a calculated index of human capital per person, based on years of schooling (Barro and Lee 2012) and returns to education (Psacharopoulos 1994). Human capital per worker does not have a natural unit. The value of human capital index in the PWT9.0 ranges between 1 and 3.7.

FIGURE A6
Human Capital Index for African countries, 2010 or latest available



Source: Calculations based on data from Penn World Table 9.0.





INTRA-AFRICAN MIGRATION, JOB CREATION, AND TRANSFORMATION

Junior Davis, UNCTAD
and
Jane Muthumbi, UNCTAD

African international migration is primarily within the continent. Most of Africa's international migrants stay in Africa, many circulating within their same African region¹ in search of economic opportunities. Economic migration features relocation to economic hubs for employment and other economic opportunities. If well managed, it has the potential to generate jobs for youth and women, boost economic productivity, foster innovation, and enable entrepreneurship, possibly stimulating further job creation.²

Migration can promote structural transformation in Africa through trade and economic activity that boosts socioeconomic development in both sending and receiving countries. Sending countries benefit through improved socioeconomic indicators, due to remittance inflows boosting household income funding for education and healthcare, through increased trade opportunities (especially for women involved in informal cross-border trade activities), growth in diaspora tourism, which generates jobs at home, and reduced unemployment. Receiving countries benefit across sectors through productivity gains.

Demand in key economic sectors—agriculture, mining, construction, and, more recently, services—drives intra-African migration, with diversified economies across regions attracting foreign labor while promoting regional economic integration. Africa's international migrants often acquire skills in receiving countries that enable them to transition from low- to higher-productivity activities, earn higher incomes and create better

livelihoods, and boost productivity in receiving countries.

Investment in skills development, including in tertiary education and vocational training, can provide migrants the skills to benefit from regional economic opportunities. Boosting agriculture and the agricultural value chain can take advantage of areas of competitive advantage. Encouraging investment in agriculture and in manufacturing—both technology and labor-intensive production in low-cost locations—will support job growth, foster diversification, and contribute to economic growth.

DRIVERS OF ECONOMIC MIGRATION IN AFRICA

African economic migrants have relocated to economic growth hubs in regional markets. Labor demand and migrant skills influence mobility patterns, trends, and dynamics across regions.

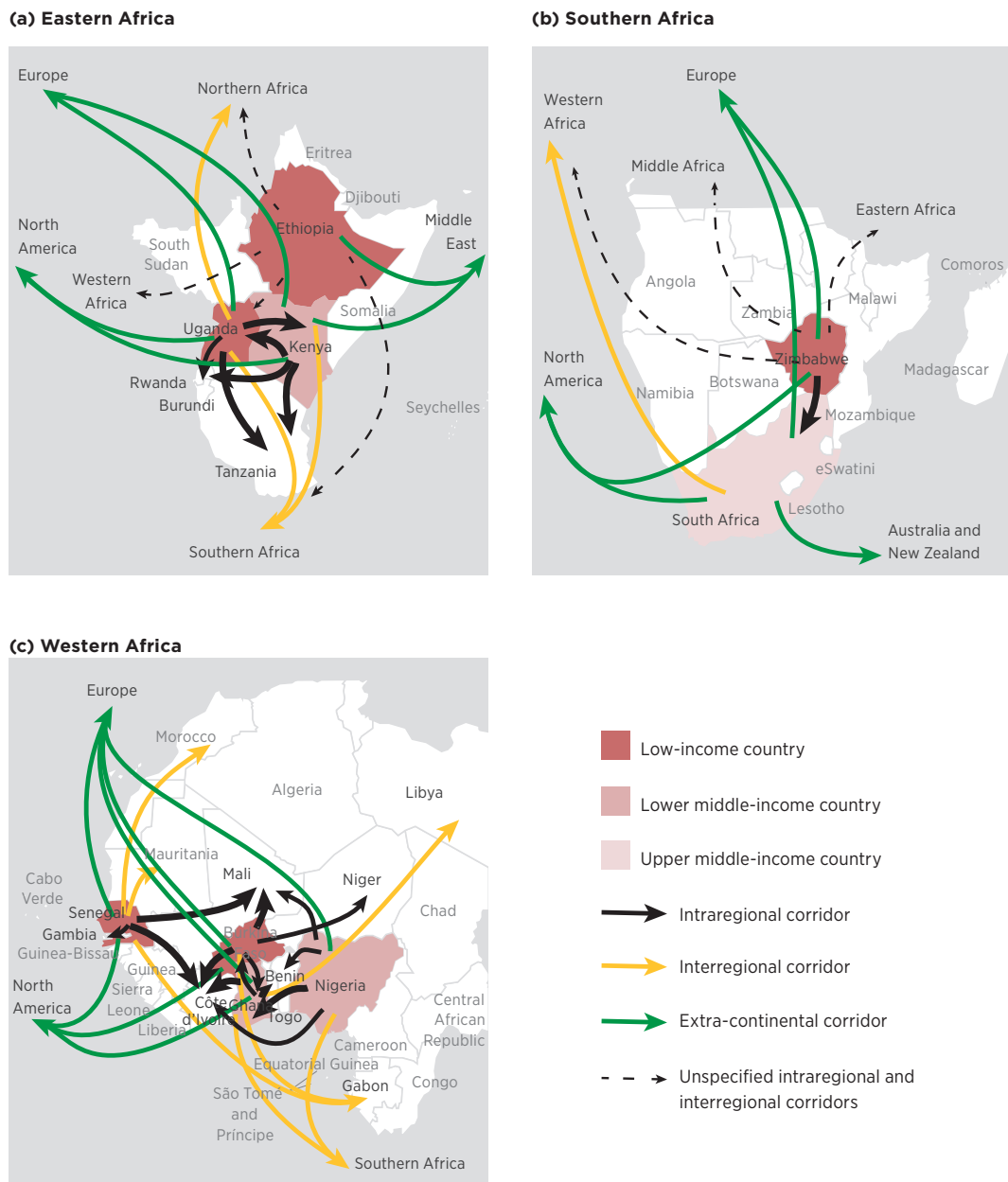
Migration affects migrants, sending countries, receiving countries, and regional economies.

Labor demand

Demand in such sectors as mining, construction, and agriculture, which historically influenced migration in Africa, continues to drive it today. In

Western Africa, robust labor demand in construction and agriculture fuels intraregional movement along the major economic corridor from Burkina Faso to Côte d'Ivoire and interregional movement from Burkina Faso and Senegal to Gabon's agriculture and lumber sectors (figure 1). Similarly, in Southern Africa, demand in mining, construction, and commercial agriculture drives economic

FIGURE 1
International migration corridors in Eastern, Southern, and Western Africa



Source: UNCTAD 2018.

migration in the Southern African Development Community (SADC), including the key corridor from Zimbabwe to South Africa.

Increasingly, demand in trade and services—notably, domestic work and skill-intensive sectors such as finance, engineering, and information technology—drives migration across the continent. In Eastern Africa, growing labor demand in services and trade has fueled intraregional migration from Uganda and Kenya to other East African Community (EAC) states and interregional migration from Eastern Africa to Congo and Sudan.

In Western Africa, trade drives intraregional migration from Nigeria to neighboring Benin, Ghana, and Togo, as well as to Côte d'Ivoire and Mali (table 1), while in Southern Africa, domestic work and informal trade drive women's migration. In the Horn of Africa, informal trade has driven intraregional migration, and in the Middle East, domestic services and construction draw migration from Africa.

Protocols on the free movement of persons, notably, the Economic Community of West African States (ECOWAS) protocol related to free

movement of persons, residence, and establishment and the EAC protocol on the common market have facilitated mobility within their labor markets.

Skills

The migration of skills—low-skilled, semiskilled, and highly skilled labor—characterizes contemporary economic migration in Africa. Skills determined by education levels influence the labor market prospects of migrants. Higher levels of education allow skills transfer to different sectors and increase a worker's income potential. Educational level is an important determinant of a worker's propensity to migrate, except when the head of household is well-educated, and also influences the mobility of migrants within receiving countries (figure 2).

Highly skilled migration is a characteristic of contemporary African economic migration and a feature of African economies irrespective of economic development level. Small and low-income countries, as well as countries experiencing conflict and small island developing states, have higher rates of skilled emigration (table 2).³

Highly skilled migrants in Africa, most with a tertiary level education or professional qualifications, work as managers, professionals, and technicians. Demand in skill-intensive sectors such as finance, management, and information technology have fueled highly skilled migration from Kenya, Nigeria, Uganda, and SADC partner states to South Africa. Similar labor shortages in finance, engineering, management, hospitality, and information technology have fueled highly skilled migration from Kenya and Uganda to Rwanda in Eastern Africa.

Semiskilled migration occurs in sectors such as mining, construction, and services, which present some barriers of education and skill requirements. They attract persons who mostly have a secondary school level of education or vocational training. Demand in these labor-intensive sectors has

TABLE 1
Intraregional and interregional migration receiving countries for selected sending countries

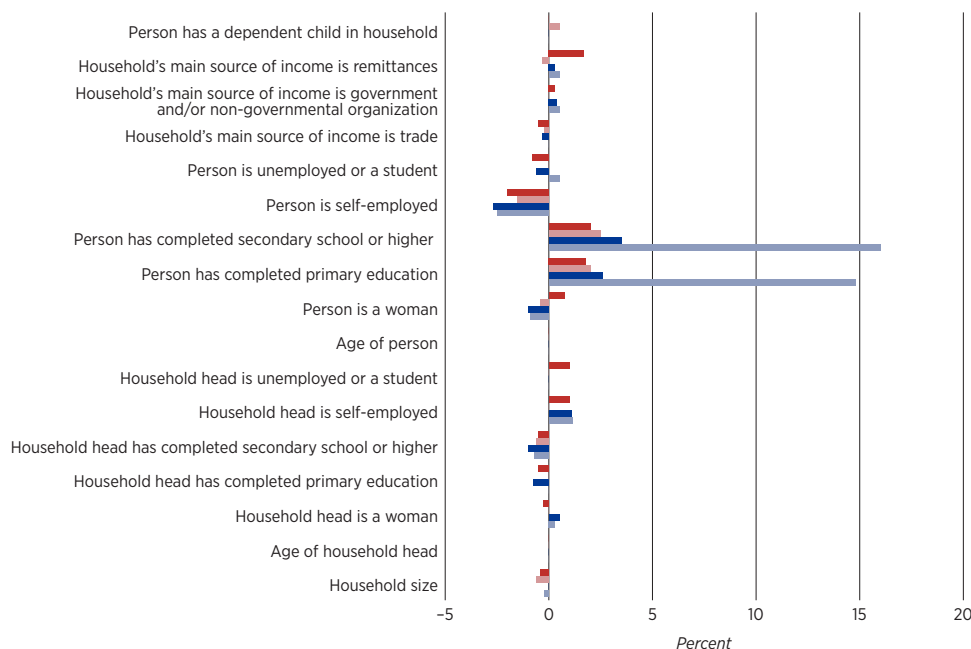
Sending country	Intraregional receiving country	Interregional receiving country
Burkina Faso	Côte d'Ivoire; Ghana; Mali; Niger; Togo (ECOWAS)	Gabon
Ethiopia	Unspecified (within IGAD)	Unspecified
Ghana	Burkina Faso; Côte d'Ivoire; Togo (ECOWAS)	Libya; South Africa; Zambia
Kenya	Rwanda; Uganda; United Republic of Tanzania (EAC)	Congo; South Africa; Sudan; Zimbabwe
Nigeria	Benin; Côte d'Ivoire; Ghana; Mali; Togo (ECOWAS)	South Africa; other unspecified destinations in Africa
Senegal	Côte d'Ivoire; Gambia; Mali (ECOWAS)	Gabon; Mauritania; Morocco
South Africa	Unspecified	Nigeria
Uganda	Burundi; Kenya; Rwanda; Tanzania (EAC)	Sudan; South Africa
Zimbabwe	South Africa (SADC)	Unspecified

Source: UNCTAD 2018.

FIGURE 2

Personal and household determinants of migration in Ethiopia and Zimbabwe

■ Zimbabwe internal migrant ■ Zimbabwe international migrant ■ Ethiopia internal migrant ■ Ethiopia international migrant



Source: Litchfield et al. 2018.

Note: The figure shows the logistic regression odds ratios of the probability of being an internal or international migrant compared with being a non-migrant. A positive log odds ratios suggests that a given factor is associated with a greater probability of being an internal or international migrant compared with not being a migrant, and a negative log odds ratio suggests that the factor is associated with a lower probability.

TABLE 2

Share of migrants in highly skilled occupations in sending and receiving countries (percent)

	Sending country	Receiving country
Burkina Faso (2010)	2.2	3.2
Ethiopia (2014)	6.3	11.9
Ghana (2013)	9.4	8.5
Senegal (2010)	7.8	11.9
South Africa (2010)	25.2	29.9
Zimbabwe (2015)	16.1	14.7

Source: UNCTAD 2018.

Note: Highly skilled occupations are managers, professionals and technicians, and associate professionals.

been a key driver of migration in Southern Africa. Demand in manufacturing has been a major driver of women's internal migration in the Horn of Africa, especially for work in footwear, textiles, and garment production in Ethiopia's Eastern and Bole Lemi special economic zones. Similarly, demand in construction generated by infrastructure

projects has been an important driver of men's intra-African migration to Ethiopia and extra-continental migration to the Middle East.

Low-skilled migration is the predominant form of economic migration in Africa. Presenting few barriers of education or experience to entry, it is concentrated in agriculture, informal trade, and domestic service. Increasingly, demand in domestic work in South Africa has been an important driver of intra-African mobility among low-skilled women from Lesotho. Growing demand in domestic work in the Middle East has become a major driver of extra-continental migration for women from Ethiopia, Kenya, and Uganda.

Informal cross-border trade drives migration among low-skilled women across the continent. In Western Africa, women migrants buy and sell a variety of goods, including clothes and beauty products, for instance women migrants from Ghana and Nigeria who sell cosmetics in Senegal.⁴ In Southern

Africa, women migrants account for 70 percent of informal cross-border trade, making up as much as 30–40 percent of SADC trade.⁵ Interregional informal trade is characterized by informal traders from Eastern Africa (Ethiopia and Somalia) and from Central and Western Africa who moved to a region to take advantage of service sector opportunities.

Individual countries and several regions have eased migrant mobility and fueled skills migration to regional markets. South Africa has adopted a policy to raise the number of highly skilled professionals migrating from SADC partner states, whom it has historically tried to attract by granting work permits.⁶ South African bilateral labor agreements with SADC partner states have facilitated the mobility of semiskilled miners and construction workers. In Eastern Africa, the abolition of work permit requirements by some EAC partner states has facilitated the intraregional mobility of highly skilled migrants, while Rwanda’s temporary resident permit for semiskilled workers has enabled workers in EAC partner countries to take advantage of opportunities in Rwandan labor markets, including work in small and medium enterprises and employment as restaurant workers, beauty salon attendants, and motor vehicle mechanics.⁷

Intra-African migration’s impact on migrants and African economies

Migration benefits migrants, countries, and regional economies. Migrants in highly skilled occupations readily transfer their professional skills to receiving countries and usually earn relatively high incomes. But sending countries lose highly skilled human resources and their own investments in educating and training them.⁸ To avert critical health sector skills shortages in developing countries, South Africa’s National Department of Health prohibits recruiting health-care professionals from them, including from SADC partner states.⁹ Some deskilling occurs, in which a receiving country does not recognize the professional qualifications of migrants, who are unable to find jobs commensurate with their experience. This suggests a possible skills mismatch.¹⁰

Semiskilled and low-skilled migrants in regional labor markets often earn higher incomes and acquire new or upgraded skills that raise their productivity, underscoring the positive effects of migration. The decline in the share of low-skilled migrants from Burkina Faso, Ghana, and South Africa and the corresponding increase in the share of semiskilled migrants from Burkina Faso and Ghana suggest possible skills upgrading (table 3).

For semiskilled workers, restrictive immigration policies and the lack of visas and work permits can hinder mobility in regional labor markets. The lack of legal protection for semiskilled migrants in temporary unregulated employment as casual laborers in construction and mining can expose them to exploitation and push them into illegal status. Similarly, a lack of formal contracts, decent working conditions, and adequate social security and other benefits, which are pervasive in unregulated employment in commercial agriculture, hospitality, domestic service, and the informal sector, can harm low-skilled migrants.

Migration benefits countries. Intra-African migration promotes structural transformation by boosting sectoral productivity. For receiving countries, a 1 percent increase in immigration corresponds to a 0.26–0.43 percentage point increase in manufacturing value added.¹¹

Immigration is also associated with intrasectoral productivity increases. An increase of 1 percent

TABLE 3
Share of migrants in low-skilled occupations in sending and receiving countries (percent)

	Sending country	Receiving country
Burkina Faso (2010)	90.6	52.9
Ethiopia (2014)	40	57
Ghana (2013)	59.5	49
Senegal (2010)	6.7	11.2
South Africa (2010)	20.3	17.8
Zimbabwe (2015)	41.2	40.8

Source: UNCTAD 2018.
Note: Low-skilled occupations include informal trade, agriculture, and domestic service.

in the number of immigrants leads to growth in intrasectoral productivity of 0.07–0.17 percentage point over 10 years.¹² The positive effect is particularly pronounced in sectors with high migration such as mining, construction, agriculture, manufacturing, trade in services, and other services. Growing intra-African migration is likely to increase intrasectoral productivity and benefit countries with low labor productivity.

Migration's economic impact is reflected in receiving countries' growth. The migrant contribution to GDP was estimated at 19 percent in Côte d'Ivoire in 2008, 13 percent in Rwanda in 2012, 9 percent in South Africa in 2011, and 1 percent in Ghana in 2010.¹³ The contribution of immigrants to value added exceeds their share in the employed population in Côte d'Ivoire and Rwanda.

MIGRATION AND JOB CREATION IN AGRICULTURE, MANUFACTURING, AND SERVICES

Africa's economic sectors hold tremendous potential for job growth and the absorption of additional foreign labor. Agriculture, manufacturing, and services can be better harnessed for job creation.

Agriculture

Agriculture in Africa has historically attracted large flows of foreign workers in countries such as Côte d'Ivoire and South Africa. Its pull factor remains strong, leading investment promotion agencies to rank it as the sector likely to attract the highest levels of foreign direct investment (FDI), followed by food and beverages and utilities.¹⁴ But agriculture continues to suffer from underinvestment, despite ongoing emphasis on its potential. In addition, only a small proportion of FDI projects in the sector are under implementation, FDI being mainly concentrated in mining, services, quarrying, petroleum, and manufacturing.¹⁵ Agriculture in Africa remains a low-productivity sector. Growth in agriculture and the development of

related value chains are constrained by low yields, poor infrastructure, inadequate finance for agricultural production and processing, and difficulties in meeting international standards.¹⁶ And the development of the agricultural sector has been harmed in gas- and oil-exporting countries by overvalued exchange rates.

Nonetheless, the agriculture sector in Africa has vast potential for job creation and, possibly, the absorption of foreign labor. To create jobs and build vibrant regional value chains, Africa should seize opportunities to become a key global player.

The global population is expected to grow from 7.3 billion in 2015 to about 8.5 billion in 2030. Net land under cultivation may need to increase by 70 million hectares by 2050. In developing countries, 73 percent of projected growth in crop production will come from intensification through yield increases, and 6 percent through higher cropping intensities.¹⁷ However, expanding arable land will remain important in many countries, including in Sub-Saharan Africa.¹⁸ A great diversity of land and land quality is available among Africa's countries and subregions.

Countries with growing populations but scarce land or minimal capacity to expand food production are likely to turn to either trade or migration. Future emigration is likely to be highest from countries with expected large population increases but limited agricultural resources due to predominantly semiarid conditions and little irrigation potential. Niger, for instance, with a population projected to grow more than fourfold from 14 million in 2006 to 58 million in 2050, is likely to confront incompatibilities between population growth and agricultural potential.¹⁹ Similarly, Northern African countries, though generally more socioeconomically advanced than Sub-Saharan countries, have little prime arable land and thus limited potential for further agricultural job creation. Thirteen countries account for 60 percent of the 1.4 million hectares with the best quality land in developing countries. Five of them are Sub-Saharan: Angola, Democratic

Republic of Congo, Madagascar, Mozambique, and Sudan.²⁰ The remaining eight countries are unevenly distributed across different regions. Producers in Africa are favorably positioned to serve regional markets and displace imports from outside the continent.

The labor absorption capacity of agriculture cuts across different farm sizes. Smallholding farmers, essential for the continent's food security, prove to be competitive when provided an enabling environment.²¹ Although large-scale farming holds potential benefits, there is no evidence that it is either necessary or particularly promising for Africa. Instead, agricultural competitiveness in Africa requires strong institutions, the right mix of policies, and a significant rise in quality investments.²² Accordingly, agriculture has been identified by several private sector-led efforts as the most attractive sector for investment in Africa. It is at the forefront for smart development and one of the areas most needing innovation. Agricultural value chains have well-recognized potential in Angola, Ghana, Kenya, Mozambique, Nigeria, Sierra Leone, Tanzania, Zambia, and Zimbabwe.²³

The Guinea Savannah zone, which cuts across many countries, is promising for sugar, cotton, maize, rice, soybeans, and cassava. It has strong agricultural development potential, despite poor soil quality. Less than 10 percent of its 600 million hectares are in agricultural use, yet nearly 400 million hectares could be used. The region underpins the livelihoods of more than one-fourth of all farmers in Africa.

Many governments in Africa recognize the importance of the agriculture sector in job creation. For example, Nigeria's agricultural transformation agenda, which aimed to create 3.5 million jobs in 2012–15 in the rice, cocoa, cotton, sorghum, and cassava value chains and to increase farmer incomes by \$2 billion, created 2.7 million jobs in its first year and reduced the country's annual food import bill by \$5.3 billion.²⁴ If Nigeria's agriculture and its value chains continue to grow, and if the country concurrently fulfils its potential with

dynamic manufacturing and service sectors, it may have the scope to absorb its large labor force. Countries that have similar potential but risk labor shortages due to smaller populations, such as Congo, may attract foreign labor.

Manufacturing

Industrialization remains central to productivity gains and other benefits such as democratization, which can be bolstered through a well-organized workforce.²⁵ African neglect of policies to develop the manufacturing sector partly explains the continent's delayed structural transformation.²⁶ Recent findings have further highlighted manufacturing's propensity for enhancing productivity, a central element in structural transformation. For example, in formal enterprises, manufacturing is characterized by the convergence of labor productivity levels regardless of whether products are exported—that is, regardless of the vagaries of the global economy.²⁷ Competitive threats from companies abroad and an ability to upgrade technology prompt formal sector manufacturing firms to operate efficiently, thereby facilitating their integration into global production networks.

In low-income Sub-Saharan countries, the manufacturing sector's small share of total employment explains why the convergence of productivity levels has not spread to the rest of the economy. Furthermore, since most manufacturing activities that employ advanced technologies do not employ much labor, the positive effects of productivity enhancements on the rest of the economy are limited.²⁸ So, changes in nonmanufacturing sectors remain necessary to set countries on a sharper upward path of structural transformation.²⁹ Many countries in Africa have skipped manufacturing in their economic development, yet projections of China's move away from low-technology manufacturing have revived African ambitions to increase the sector's attractiveness. China's move up the technology ladder has shown the possibility of creating about 100 million labor-intensive manufacturing jobs in low-income countries. Competition for investment is strong.

Only a few African countries are seen as cost-competitive globally, compared with Southeast Asian countries.³⁰ Only a few African countries—Ethiopia, Lesotho, and Kenya—have positioned themselves as key players across a variety of value chains. Disparities in labor costs between these countries are likely to give them differing levels of attractiveness for investment. Only three Sub-Saharan countries are among the top 100 in the World Bank ease of doing business ranking for 2018: Mauritius, ranked 25; Rwanda, 41; and Kenya, 80.³¹ A few countries have substantially improved their business environments recently: Malawi, Nigeria, and Zambia. And the construction sector has seen many reforms.³²

The challenges in global manufacturing competitiveness faced by African countries are compounded by concerns about the worldwide effects of automation and artificial intelligence on supply chains.³³ New and fast developments have amplified the risk of premature deindustrialization in Africa. To date, robotization has had little direct effect on most developing countries, and, given their lack of diversification and technological upgrading, that is unlikely to change soon.³⁴ The impact of robotics is likely to depend on a country's demographic developments, economic and social policies, stage in structural transformation, and position in the international division of labor. Studies evaluating the future of manufacturing in developing countries identify textiles, electronics, and transport equipment as the best-performing sectors based on trade levels, labor productivity, share in the overall economy, scope to employ low-skilled workers, and scope for innovation and diffusion.³⁵ Despite new technology, opportunities remain great for low-cost locations in the low-technology, labor-intensive production of goods for regional trade.

Manufacturing opportunities in Africa lie primarily in the growing domestic market and regional markets. Africa could nearly double its output from \$500 billion in 2011 to \$930 billion in 2025, three quarters of which could come from meeting domestic demand, mostly in food, beverages, and similar processed goods.³⁶ Considering

the pro-trade effect of bilateral migration flows and the channels through which migration can increase trade and wealth, Africa should accelerate regional integration commitments, including provisions on labor. Locating opportunities for attracting foreign labor is difficult, since the actual size, scope for growth, and skills shortages of the informal sector have not received focused study.

Services

Health-care, financial, and wholesale and retail services are among the sectors identified as having a strong growth potential in most African countries.³⁷ But a burgeoning technology sector is included, as well. More than 100 technology hubs have been set up in Africa in the past decade, and their growth can deepen in centers such as Cape Town, South Africa, and Nairobi, Kenya (referred to as the silicon savannah). Technology is also transforming teaching and training in Africa through mobile and online channels. New fields continuously emerge in the technology industry. For instance, successive technology conferences in recent years have highlighted global shortages in data science.

Countries with an existing lead in technology and the digital economy could invest in public-private training ventures, which are likely to yield further benefits. Highly skilled migrants in skill-intensive sectors that boost economic productivity could foster innovation. New economic activities generated within the technology sector through startups and other knowledge-based activities could create additional local employment. Besides enabling entrepreneurship and stimulating job growth, such activities could generate knowledge and skill transfers and support the development of skill-intensive sectors. To embrace such potential, African technology hubs require investments in improved roads, power, and internet access. Furthermore, African startups should have greater exposure to technical expertise and receive more governmental regulatory support.

The growth of African service sectors in recent years has highlighted the potential for intersectoral

linkages. Services connect different industries. This role, if further developed at national and regional levels, can make commodity-based industrialization services a new trigger for intra-African migration. Finally, service sectors allow inclusive job creation. In tourism, for example, services have a strong multiplier effect in creating jobs for women and youth.³⁸ The services and tourism sectors present opportunities for the intra-African migration of skilled workers and for creating regional internationally competitive training centers to be supported by pooled resources.

Prospects for the financial services sector are good. It had the top number of FDI projects in Africa in 2015.³⁹ Business services are experiencing the same upward trend, with the number of FDI projects in Africa growing by 80 percent in 2016.⁴⁰ Ghana and Kenya are among the top performers. Other sectors such as logistics have also experienced growth, with Mozambique attracting the largest number of FDI projects in 2016. Different emerging competitive advantages offer scope for cross-border movements of skilled labor.

POLICY RECOMMENDATIONS

For intra-African migration to contribute to job creation and structural transformation, countries and regions must manage it better so that labor is reallocated from areas of excess to areas of shortage. That will allow migrants with varying skills to take advantage of economic opportunities, and it will alleviate youth unemployment. In addition, well-managed migration can foster social inclusion by ensuring that women, mostly concentrated in low-skilled occupations, can earn incomes that improve their livelihoods and lift them out of poverty. This benefit could raise the continent's per capita GDP from \$2,008 in 2016 to \$3,249 in 2030.

Measures to support intra-African migration

Regional policy frameworks need to address underlying constraints on migrant mobility, such

as recognizing the skills and academic qualifications of highly skilled migrants and supplying visas and work permits to low-skilled and semi-skilled migrants. Reducing barriers to mobility should:

- Recognize and harmonize skills, competences, and qualifications achieved in vocational training across borders. That could substantially improve outcomes for semiskilled migrants and allow them to take advantage of economic opportunities in regional labor markets. Similar measures, which have been implemented in the EAC, ECOWAS, and SADC and address underlying skill mismatches, have allowed highly skilled migrants to take advantage of such opportunities.
- Ensure that people can move within regions and between them in a safe, orderly, and regular fashion. Regional protocols on free movement of persons and open visa regimes can provide major support. Rwanda's temporary resident visa enables semiskilled workers from countries in the region to take advantage of labor market opportunities, including in small and medium enterprises. Continent-wide efforts to expedite the operationalization of the African passport should make the free movement of persons on the continent a reality.
- Create portability for pensions and other benefits, and also facilitate extended employment for highly skilled professionals, to open opportunities for migrants in receiving countries. On the supply side, governments can reduce the high costs associated with obtaining work permits.
- Growth in labor-intensive sectors such as agriculture and services, which have large capacities to absorb low-skilled migrants, can reallocate foreign labor, create employment paths out of poverty, and boost labor and sectoral productivity. Promising areas include:
 - Agricultural development. Maize, rice, cotton, soybeans, sugar, and cassava offer potential. Areas that are currently underutilized, such as the Sub-Saharan Guinea Savannah zone, and Mozambique,

Nigeria, and Zambia could benefit, among others.⁴¹

- Agricultural value chains, which can be developed in Angola, Ghana, Kenya, Mozambique, Nigeria, Sierra Leone, Tanzania, Zambia, and Zimbabwe to create jobs.⁴²
- Construction due to rapid urbanization fueling demand in housing and infrastructure. This sector could generate employment for semiskilled and highly skilled migrants.
- Service subsectors such as agro-processing and light manufacturing. The relatively high technical skills demanded for entry in these areas make secondary-level education or postsecondary vocational training critical for semiskilled occupations.

Demand in finance, engineering, and information technology generates employment for highly skilled migrants, including youth. This work can promote innovation and yield positive spillovers in other productive sectors in local economies. Given the high barriers to entry in skill-intensive sectors, tertiary-level education or other professional qualifications are a prerequisite. Investment in human capital development in tertiary education in sending countries is vital.

African countries can benefit further from intra-African migration by aligning their migration, trade, and investment policies with development objectives. Countries and regions, by ensuring better coherence, can spur further economic growth and structural transformation.

Policies promoting investment can catalyze labor mobility. Rwanda's policy of attracting investment from EAC partner states led to significant investments in financial services by Kenya and catalyzed labor mobility from Eastern Africa.⁴³ Intra-regional economic migration increased Rwanda's labor supply in sectors with shortages and, through the exchange of skills, contributed to the development of finance, education, engineering, and hospitality.

CONCLUSION

The Global Compact on Migration adopted in Marrakesh in December 2018 was a step forward in managing migration. With the launch of the Single African Air Transport Market and the adoption of the Africa Continental Free Trade Area Agreement by most countries on the continent, complemented by a strong development pillar, intra-African migration could contribute to the continent's socioeconomic development and structural transformation.

NOTES

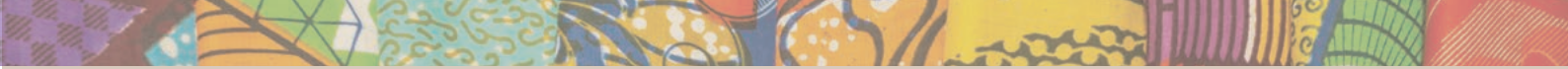
1. This study refers to African regions as classified by the United Nations—Eastern, Middle, Northern, Southern, and Western.
2. The authors would like to acknowledge the contributions to this study by Milasoia Cherele-Robson, Claudia Roethlisberger, and Anja Slany.
3. Ratha et al. 2011.
4. Andall 2018.
5. United Nations Entity for Gender Equality and the Empowerment of Women 2010.
6. UNDESA 2013.
7. IOM and African, Caribbean and Pacific Group of States Observatory on Migration 2013b.
8. UNCTAD 2012.
9. Segatti 2014.
10. IOM and African, Caribbean and Pacific Group of States Observatory on Migration 2013a.
11. UNCTAD 2018.
12. UNCTAD 2018.
13. OECD and ILO 2018.
14. UNCTAD 2017b.
15. UNCTAD 2017b.
16. UNCTAD 2015.
17. Alexandratos and Bruinsma 2012.
18. Alexandratos and Bruinsma 2012.
19. Alexandratos and Bruinsma 2012.
20. Alexandratos and Bruinsma 2012.
21. UNCTAD 2015.
22. World Bank 2009.
23. PricewaterhouseCoopers 2015.
24. PricewaterhouseCoopers 2015.
25. Rodrik 2015.

26. UNCTAD and UNIDO 2011.
27. Rodrik 2015.
28. Rodrik 2013.
29. McMillan and Rodrik 2011.
30. Hallward-Driemeier and Nayyar 2017.
31. World Bank 2018.
32. Dinh et al. 2012; Hallward-Driemeier and Nayyar 2017.
33. Rodrik 2013; UNDESA 2017.
34. UNCTAD 2017c.
35. Hallward-Driemeier and Nayyar 2017.
36. Leke, Jacobson, and Lund 2016.
37. Leke, Jacobson, and Lund 2016.
38. UNCTAD 2017a; UNCTAD 2017b.
39. fDi Intelligence 2016.
40. fDi Intelligence 2016.
41. World Bank 2009.
42. PricewaterhouseCoopers 2015.
43. IOM and African, Caribbean and Pacific Group of States Observatory on Migration 2013b.

REFERENCES

- Alexandratos, N., and J. Bruinsma. 2012. "World Agriculture towards 2030/2050: The 2012 Revision." Agricultural Development Economics Working Paper No. 12-03, Food and Agriculture Organization of the United Nations, Rome, Italy.
- Allard, J. 2018. "Intra-African Female Labour Migration: Common Issues, Work and Rights." UNCTAD Economic Development in Africa Report Background Paper No. 1, Geneva, Switzerland.
- Dinh, H.T., V. Palmade, V. Chandra, and F. Cossar. 2012. *Light Manufacturing in Africa: Targeted Policies to Enhance Private Investment and Create Jobs*. Washington, DC: World Bank.
- fDi Intelligence. 2016. *The Africa Investment Report 2016: Foreign Investment Broadens its Base*. London, UK.
- Hallward-Driemeier, M., and G. Nayyar. 2017. *Trouble in the Making? The Future of Manufacturing-Led Development*. Washington, DC: World Bank.
- IOM (International Organization for Migration) and African, Caribbean and Pacific Group of States Observatory on Migration. 2013a. *Spotlight on the Young and Skilled: Exploring the Potential Contribution of Kenya's Diasporas in the South*. Brussels, Belgium.
- . 2013b. *The Biggest Fish in the Sea? Dynamic Kenyan Labour Migration in the East African Community*. Brussels, Belgium.
- Leke, A., P. Jacobson, and S. Lund. 2016. "These 6 Sectors of Africa's Economy are Poised for Growth." *Harvard Business Review*.
- Litchfield J., P. Rolla, F. Jena, U. Dzingirai, K. Nyikahadzoi, and P. Mutopo. 2018. "Migrant Remittances and Gender in Zimbabwe." Migrating Out of Poverty Working Paper, Migrating Out of Poverty Research Programme Consortium, University of Sussex.
- McMillan, M., and D. Rodrik. 2011. "Globalization, Structural Change and Productivity Growth." National Bureau of Economic Research Working Paper No. 17143, Cambridge, MA.
- OECD (Organisation for Economic Co-operation and Development) and ILO (International Labour Organization). 2018. *How Immigrants Contribute to Developing Countries' Economies*. Paris, France.
- PricewaterhouseCoopers. 2015. *Food Security in Africa: Water on Oil*. London, UK.
- Ratha, D., S. Mohapatra, Ç. Özden, S. Plaza, W. Shaw, and A. Shimeles. 2011. *Leveraging Migration for Africa: Remittances, Skills and Investments*. Washington, DC: World Bank.
- Rodrik, D. 2013. "Unconditional Convergence in Manufacturing." *The Quarterly Journal of Economics* 128 (1): 165–204.
- . 2015. "Premature Deindustrialization." National Bureau of Economic Research Working Paper No. 20935, Cambridge, MA.
- Segatti, A. 2014. *A Disposable Workforce: Foreign Health Professionals in the South African Public Service*. Johannesburg, South Africa: University of the Witwatersrand African Centre for Migration and Society.
- UNCTAD (United Nations Conference on Trade and Development). 2012. *The Least Developed Countries Report 2012: Harnessing Remittances and Diaspora Knowledge to Build Productive Capacities*. New York, NY, and Geneva, Switzerland.

- . 2015. *Commodities and Development Report: Smallholder Farmers and Sustainable Commodity Development*. New York, NY, and Geneva, Switzerland.
- . 2017a. *Economic Development in Africa Report 2017: Tourism for Transformative and Inclusive Growth*. New York, NY, and Geneva, Switzerland.
- . 2017b. *World Investment Report 2017: Investment and the Digital Economy*. New York, NY, and Geneva, Switzerland.
- . 2017c. *Trade and Development Report 2017: Beyond Austerity—Towards a Global New Deal*. New York, NY, and Geneva, Switzerland.
- . 2018. *Economic Development in Africa Report: Migration for Structural Transformation*. New York, NY, and Geneva, Switzerland.
- UNCTAD and UNIDO (United Nations Industrial Development Organization). 2011. *Economic Development in Africa Report 2011: Fostering Industrial Development in Africa in the New Global Environment*. Geneva.
- UNDESA (United Nations Department of Economic and Social Affairs). 2013. *International Migration Policies*. New York, NY.
- . 2017. *Frontier Issues: The Impact of the Technological Revolution on Labour Markets and Income Distribution*. New York, NY.
- United Nations Entity for Gender Equality and the Empowerment of Women. 2010. *Unleashing the Potential of Women Informal Cross Border Traders to Transform Intra-African Trade*. Available at <http://www.unwomen.org/en/digital-library/publications/2010/3/unleashing-the-potential-of-women-informal-cross-border-traders-to-transform-intra-african-trade>.
- World Bank. 2009. *Awakening Africa's Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond*. Washington, DC.
- . 2018. *Doing Business 2018: Reforming to Create Jobs*. Washington, DC.





PART 2

NEW CHALLENGES AND NEW OPPORTUNITIES



CONSTRAINTS TO EMPLOYMENT CREATION IN AFRICA

Stephen S. Golub, Swarthmore College
Ahmadou Aly Mbaye, Cheikh Anta Diop University
Laura Chen, Swarthmore College
Fatou Gueye, Cheikh Anta Diop University
Jorge Luis Tello Garza, Swarthmore College

This study explores supply- and demand-side barriers to employment creation in Sub-Saharan Africa. It focuses on five low- and low-middle-income countries with grave underemployment problems: Benin, Burkina Faso, Ethiopia, Ghana, and Senegal. African labor markets are characterized by a sharp dualism between little formal employment and much informal employment—80–95 percent in low-income countries. Vulnerable employment is also 80–90 percent, and higher for women. The agricultural and urban informal sectors feature pervasive underemployment. Workers in small informal firms typically earn about one-fifth of the earnings of employees in formal firms, and absolute poverty remains high in four of the five focus countries.

The supply of labor is expanding rapidly due to high population growth. But skill mismatches between potential employees and firms due to lack or poor quality of education and training contribute to low levels of formal employment. And people with higher education in the focus countries have higher nonemployment rates than the population as a whole, because the education system focuses on preparing students for the civil service and fails to impart the practical skills sought by employers. Vocational training must also be improved and coordinated with the private sector to ensure that workers receive training useful to employers.


Labor-intensive sectors need to grow to demand skilled workers. Manufacturing for export is not the only vehicle to achieve this—agricultural exports, tourism, and fishing are alternatives, since they are labor-intensive, confront the quality requirements of developed-country markets, and

are subject to technological upgrading. Attracting foreign investment and technology while keeping wages low until productivity rises is key.

Supportive government policies and a reasonably well-functioning business climate are crucial to successful low-income exporters. Long-term improvements in economy-wide infrastructure and institutions can be supplemented by short-cuts through export processing zones, regional growth poles, and business incubators.

INTRODUCTION

Improving employment opportunities is desirable in itself and crucial to poverty reduction. In Sub-Saharan Africa, although people have jobs—they are simply too poor not to work—underemployment is pervasive. Typically,



90 percent or more of the labor force works in the informal sector in subsistence agriculture, urban self-employment in petty services, and similar activities. African labor markets are marked by large disparities between a small number of formal public and private employees and a vast number of informal sector workers with very low pay, no job security, minimal benefits, and, often, hazardous working conditions.

Impediments to both the supply of and the demand for labor account for Africa's lagging performance in creating formal sector jobs. Human capital deficiencies due to inadequate education and training diminish the supply, while the product market provides too little demand.

On the supply side, although countries have made major strides in educational attainment, schooling and training programs often fail to provide the skills that employers seek. On the demand side, although economic growth in Africa has picked up since the early 1990s, it has occurred mostly in informal services and in capital-intensive sectors, such as natural resource extraction. Neither has led to much growth of formal sector employment opportunities. Firms cite corruption, lack of infrastructure, and pervasive red tape and labor-market regulations as the greatest barriers to investment and job creation.

This study explores supply- and demand-side barriers to employment creation in Sub-Saharan Africa. It focuses on five low- and low-middle-income countries with grave underemployment problems: Benin, Burkina Faso, Ethiopia, Ghana, and Senegal. The five are not resource abundant and so are not subject to the resource "curse." And they have not been so disrupted by social strife as to preclude economic development. In other respects, they are diverse enough to illuminate the general nature of the Sub-Saharan underemployment problem. Four other countries serve as comparators: China, Bangladesh, Mauritius, and Viet Nam. Mauritius is one of the few African countries to have successfully lowered poverty through employment creation. Bangladesh, China, and

Viet Nam, likewise, have recently achieved rapid formal employment increases starting from very low incomes. The study argues that governments should adopt policies that raise the demand for African labor, while also improving worker training and building entrepreneurs' skills.

The study combines qualitative and quantitative analysis of labor markets in the five focus countries and four comparators. It describes the evolution of employment in the countries under study and discusses labor supply constraints and impediments to labor demand due to the business environment. It represents case studies of the five focus countries, including policy recommendations. Finally, the study offers conclusions and policy recommendations.

THE PREVALENCE OF INFORMAL AND PRECARIOUS EMPLOYMENT IN AFRICA

Open unemployment is often 5 percent or less of the labor force in Sub-Saharan Africa.¹ The problem is the quality rather than the quantity of jobs: the vast preponderance of the labor force is employed in the informal sector. Casual observation highlights how few employees receive regular wages and benefits—instead, street hawkers typify city employment, and subsistence farmers typify agriculture.

The informal sector is complex, with a continuum of characteristics, such as firm size, tax payments, registration, access to credit, and stability of work location.² Likewise, informal employment has a variety of characteristics.³ Sometimes, it is defined as less than full-time work—but many informal workers work long hours. Sometimes, it is identified with self-employment and work in household enterprises. Lack of regular wage payments and absence of social insurance coverage are often features—but some workers in formal firms may be subject to these conditions, and some self-employment is quite remunerative. And these definitions overlap substantially. But typically,

self-employed and family workers have irregular hours and do not receive wage payments or any form of official social security protection.

African employment data are sparse and usually out of date. The very concepts of labor force participation, employment, and unemployment used in developed economies are problematic in low-income Africa.⁴ Nevertheless, the available information paints a consistent pattern: African labor markets are characterized by a sharp dualism between very small formal employment and much informal employment. The agricultural and urban informal sectors feature pervasive underemployment.

Sub-Saharan labor force participation rates are not dramatically different from those in other developing regions. They are slightly lower for men than in Latin America and South Asia. And they are, surprisingly, higher for women, though lower than in East Asia. Labor force participation has not increased over time in Africa, unlike in many other areas, and has even fallen in some countries. For example, in Benin, it stayed around 72 percent from 2000 to 2016. Moreover, the distinction between being in or out of the labor force is hazy, given the substantial number of domestic workers incorrectly counted as out.

In Sub-Saharan low-income countries, informal employment accounts for at least 80 percent of total employment, and often 90–95 percent (informal employment is defined here as agricultural work, non-wage employment, and part-time wage employment; table 1).⁵ In half the countries in table 1, government employment exceeds formal private sector employment, whereas in the other half, the opposite is true. In all the countries, however, both formal private and government employment are less than 15 percent of the labor force, and they are often less than 5 percent. In urban areas, informal employment (with agriculture excluded) predominates and has risen over time (table 2).

Since informality is a matter of degree, the share of employment counted as informal is a rough

TABLE 1
Distribution of employment by sector in selected Sub-Saharan low-income countries

Percent of the labor force

Country/year of survey	Public sector	Formal private sector	Informal sector
Benin, 2005	2.6	2.1	95.3
Burkina Faso, 2005	4.3	1.0	94.7
Cameroon, 2005	4.9	4.7	90.4
Congo, 2005	6.3	1.8	91.9
Ethiopia, 2005	3.9	6.2	89.9
Ghana, 2010	6.4	7.0	86.6
Madagascar, 2005	—	—	86.5
Malawi, 2004	9.0	11.5	79.5
Mali, 2007	3.1	0.4	96.5
Nigeria, 2004	8.0	0.3	91.8
Rwanda, 2006	3.7	1.2	95.1
Senegal, 2001	1.8	6.1	92.1
Tanzania, 2006	3.0	1.5	95.5
Uganda, 2006	2.8	14.2	83.0
Zambia, 2005	5.2	6.8	88.0

Source: Golub and Hayat 2015.
— is not available.

TABLE 2
Urban informal employment in four African focus countries

Percent of total urban employment

Country	1980s	2010s
Benin	—	96.2
Burkina Faso	70.0	88.4
Ghana	—	77.7
Senegal	76.0	87.0
Sub-Saharan Africa average	67.3	73.3

Source: Charmes 2018.
— is not available.

estimate. In agriculture, a few large plantations can be classified as formal, and even small-scale farming may share some aspects of formal organization and social protection, such as stabilization of producer prices for commodities, as for cocoa in Ghana. Furthermore, the informal sector is heterogeneous.⁶ A few informal firms have large sales volume but operate as informal in most other respects. Analysts such as Mbaye and coauthors

often split informal firms into large and small. Large informal firms exceed \$100,000 in annual sales yet fulfill other criteria of informality and pay little or no tax—nevertheless, they play a major role in some sectors. Small informal firms far outnumber large ones. “Vulnerable employment” is defined by the International Labour Organization (ILO) as self-employment and contributing family workers—similar but not identical to underemployment or informal employment. Adding vulnerable employment to unemployment provides a measure of a country’s precarious employment status. In the five focus countries, the rate of precarious employment was about 90 percent in 1991, except in Ghana, where it was about 80 percent

(table 3). The rate remained elevated until 2015, although Ghana and especially Senegal exhibited steady improvement (alternative measures suggest that the improvement in Senegal may be overstated). Ethiopia improved somewhat over 2010–13.⁷ Benin and Burkina Faso’s precarious employment share remained around or above 90 percent. The level of precariousness in West Africa is also shown in the 40 percent of workers earning below the minimum wage—in Burkina Faso, 61 percent.

For women, employment precariousness was even worse, with vulnerable employment constituting about 95 percent of women’s employment in Benin and Burkina Faso in 2016 (table 4).⁸ In Senegal, the improvement for women over 1990–2016 is less marked than for total employment.

The comparator countries show a rather different picture (table 5). In Mauritius, the employment situation had already improved before the 1990s, reflecting rapid development based on labor-intensive exports of garments in earlier decades. Bangladesh, China, and Viet Nam showed dramatic improvements over 1991–2015, also reflecting their rapid export-led growth. The improvements for women in the comparator countries were similar to the economy-wide averages, since women are often employed in manufacturing plants in Asia.

The huge disparities in remuneration between formal and small informal firms are evident in data gathered through enterprise surveys in the largest cities in five African countries (table 6).⁹ Employees in formal firms typically earn about five times more than workers in small informal firms. In the small informal firms, monthly incomes are generally a little more than \$100 a month, which undoubtedly leaves many of the families of these workers below the \$2 per day poverty threshold. Incomes in large informal firms are typically between those of formal and small informal firms—closer to those in formal firms in Burkina Faso, Gabon, and Senegal, and closer to those in small informal firms in Benin. If agriculture and smaller urban areas were included, mean informal

TABLE 3
Vulnerable employment plus unemployment in African focus countries

Percent of the labor force

Year	Benin	Burkina Faso	Ethiopia	Ghana	Senegal
1991	89.8	96.6	89.1	78.9	90.0
1992	88.8	96.6	88.7	78.3	82.6
1993	88.7	96.6	90.0	78.8	81.9
1994	88.8	96.3	90.9	78.6	82.6
1995	88.7	95.9	90.9	77.9	81.7
1996	88.3	95.0	90.6	77.6	82.1
1997	88.1	94.8	89.2	77.9	81.9
1998	87.9	94.4	90.6	77.5	81.0
1999	88.9	94.9	92.0	77.8	80.2
2000	88.8	94.7	92.6	77.9	80.1
2001	88.7	94.2	92.8	76.6	80.1
2002	88.3	93.9	93.1	76.8	76.4
2003	88.5	93.9	93.4	75.4	75.8
2004	90.4	94.5	92.9	74.2	75.8
2005	90.4	93.9	91.9	73.9	74.2
2006	90.3	93.5	94.0	75.5	75.2
2007	90.3	94.1	93.6	79.4	75.3
2008	90.1	92.8	92.5	77.6	74.0
2009	90.1	93.4	91.8	77.8	73.5
2010	90.2	93.3	91.9	76.7	72.8
2011	90.3	93.4	91.2	72.7	74.2
2012	90.2	92.8	90.0	72.2	73.4
2013	90.1	92.7	89.9	71.7	73.6
2014	89.8	92.6	—	71.2	73.1
2015	89.7	92.5	—	71.0	72.6

Source: World Bank jobs data, based on ILOSTAT, 2017.
— is not available.

TABLE 4
Female vulnerable employment in African focus countries

Percent of female employment

Year	Benin	Burkina Faso	Ethiopia	Ghana	Senegal
1991	95.8	98.7	91.0	88.6	92.2
1992	95.6	98.7	90.6	88.4	86.8
1993	95.5	98.7	91.8	88.5	86.3
1994	95.5	98.6	92.8	88.2	86.8
1995	95.5	97.9	92.8	87.9	86.2
1996	95.3	97.4	92.4	87.5	86.2
1997	95.2	97.3	91.3	87.7	86.0
1998	95.1	97.0	92.6	87.3	85.8
1999	95.7	97.1	93.3	87.0	85.2
2000	95.5	97.1	94.4	86.8	84.7
2001	95.5	96.8	94.3	86.5	84.7
2002	95.3	96.6	94.5	86.2	86.4
2003	95.2	96.6	94.8	85.7	85.5
2004	95.8	96.5	94.4	85.1	85.5
2005	95.7	96.1	93.5	84.8	84.3
2006	95.7	96.1	95.5	85.4	84.6
2007	95.5	96.2	95.2	85.3	84.8
2008	95.3	95.4	94.3	84.9	83.4
2009	95.2	95.8	93.7	84.1	82.6
2010	95.4	95.8	93.7	83.8	82.2
2011	95.3	95.8	93.1	82.4	82.9
2012	95.2	95.4	91.9	81.5	82.1
2013	95.1	95.2	92.0	80.7	82.2
2014	94.9	95.1	53.1	80.1	81.7
2015	94.8	95.1	53.0	79.8	81.1
2016	94.8	95.0	51.8	79.3	80.2

Source: World Bank jobs data, based on ILOSTAT, 2017.

TABLE 5
Vulnerable employment and unemployment in comparator countries

Percent of the labor force

Year	Bangladesh	China	Mauritius	Viet Nam
1991	86.9	74.9	23.1	87.8
1992	87.1	73.3	17.1	87.8
1993	85.9	67.9	18.1	87.5
1994	85.8	64.5	18.5	87.3
1995	85.5	60.7	22.8	86.0
1996	84.6	58.0	22.4	82.3
1997	86.9	56.6	23.1	82.6
1998	85.5	56.0	23.1	79.6
1999	85.7	55.3	24.3	82.3
2000	84.8	54.3	24.8	81.5
2001	87.0	53.5	22.5	80.0
2002	86.8	52.5	23.1	79.6
2003	86.7	50.3	23.4	78.4
2004	88.0	48.0	23.9	74.4
2005	87.1	46.3	24.8	73.9
2006	69.8	44.8	23.9	72.3
2007	68.2	43.3	24.1	71.0
2008	66.3	41.4	22.4	69.5
2009	65.8	40.5	22.0	68.9
2010	64.8	39.4	22.6	67.6
2011	63.6	38.2	22.0	65.3
2012	62.4	37.6	24.0	63.1
2013	61.0	37.1	23.6	63.1
2014	60.0	36.5	23.5	62.7
2015	59.0	35.9	23.5	58.8

Source: World Bank jobs data, based on ILOSTAT, 2017.

TABLE 6
Average monthly incomes in urban formal and informal sectors in African focus countries, around 2015

\$

Country	Formal	Large informal	Small informal
Benin	674	227	104
Burkina Faso	646	426	143
Cameroon	533	324	104
Gabon	539	410	115
Senegal	671	441	116

Source: Based on surveys conducted for Mbaye and Golub (forthcoming).

Note: The surveys were conducted in the major cities of each country: Dakar (Senegal), Cotonou (Benin), Ouagadougou (Burkina Faso), Douala and Yaounde (Cameroon), and Libreville (Gabon).

incomes would likely be even lower. These data confirm the dualism of labor markets in low-income Sub-Saharan Africa: a few remunerative formal sector jobs and somewhat well-paying large informal sector jobs versus a mass of small informal employment with subsistence-level earnings.

Consequently, poverty in the focus countries, though it fell, remained quite high between 1990 and around 2015, except in Ghana, where it fell considerably (table 7). (Poverty here is absolute poverty—households subsisting on \$1.90 a day or less in 2011 purchasing power parity.) Among the comparator countries, absolute poverty was largely eradicated by the 2000s in China, Mauritius,

TABLE 7**Poverty rates in African focus countries and comparator countries***Percent of population*

Country	1990-94	1995-99	2000-04	2005-09	2010-16
Africa					
Benin	—	—	48.8	—	49.6
Burkina Faso	83.1	81.6	57.3	55.3	43.7
Ethiopia	67.1	55.5	36.4	33.6	26.7
Ghana	49.8	35.7	25.7	19.6	12.0
Senegal	68.4	—	49.2	24.5	38.0
Comparators					
Bangladesh	44.2	35.7	36.4	19.6	14.8
China	66.6	40.5	18.7	14.7	1.4
Mauritius	—	—	—	0.4	—
Viet Nam	52.9	35.5	26.5	14.8	2.6

Source: World Bank jobs data, based on ILOSTAT, 2017.

Note: Poverty is based on the threshold of \$1.90 per day in household income, in 2011 purchasing power parity. — is not available.

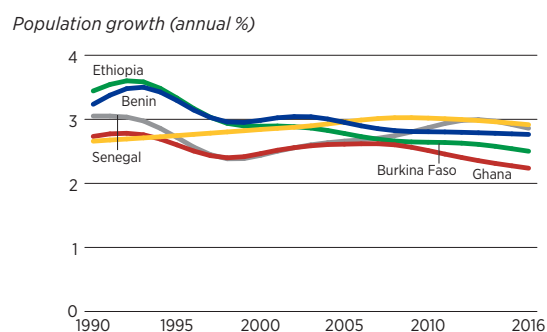
and even Viet Nam, and in Bangladesh, dropped steeply in the 2000s to below 15 percent. Creating more remunerative and stable employment opportunities is decisive for reducing poverty rapidly.

IS LABOR SUPPLY CONSTRAINING EMPLOYMENT CREATION IN AFRICA?

The labor force in low-income African countries is expanding rapidly due to high population growth. In the African focus countries, population growth was around 3 percent a year in 1990. Over the next 25 years it fell in Ethiopia and Ghana, and to a lesser extent Benin, but remained well above 2 percent; it did not fall for Burkina Faso or Senegal (figure 1).

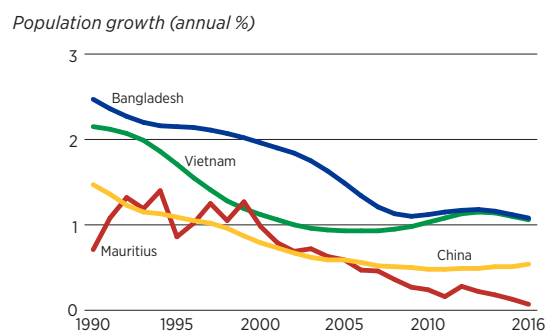
In contrast, China and Mauritius's already low population growth rate declined to below 1 percent over 1990–2016 (figure 2). Bangladesh and Viet Nam's also dropped sharply, reflecting increasingly successful demographic transitions going hand-in-hand with rapid economic growth and rising employment, particularly for women. Women's empowerment is known to start a positive cycle of economic development leading to more rational choices in family planning and child rearing.

FIGURE 1
Population growth in African focus countries



Source: Based on World Bank jobs data.

FIGURE 2
Population growth in comparator countries



Source: Based on World Bank jobs data.

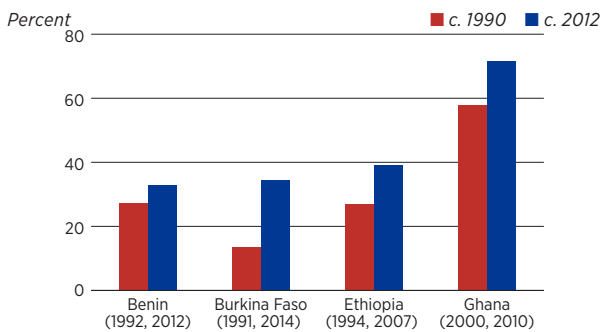
Education and skills mismatches

Thus, the supply of labor can hardly be considered a constraint on employment creation in Sub-Saharan Africa. Rather, skill mismatches between potential employees and firms due to lack or poor quality of education and training contribute to low levels of formal employment. Educational attainment is improving in low-income Africa but remains below that in comparator countries, as revealed by literacy statistics (figures 3–6). The low-income African countries generally had considerably lower literacy rates than the comparator countries for both men and women in 1990. In both groups of countries, substantial increases occurred over the next 26 years, except in Senegal. By 2016, male literacy rates in China, Mauritius,

and Viet Nam approached 100 percent, with female rates only slightly lower. Bangladesh experienced particularly rapid growth in literacy rates, especially for women. In the five low-income African focus countries, literacy rates also rose but remained well below those in the comparators, with the partial exception of Ghana, which has literacy rates similar to those of Bangladesh. (However, in Bangladesh, the difference between men's and women's rates is less than in Ghana, because women's rates rose especially quickly in Bangladesh.) Thus, education system weaknesses undoubtedly contribute to holding back remunerative employment in Africa.

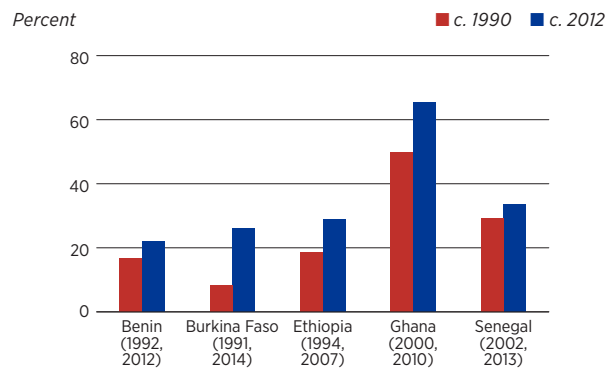
If education were a critical constraint on employment, people with higher educational attainment

FIGURE 3
Male literacy rates in African focus countries



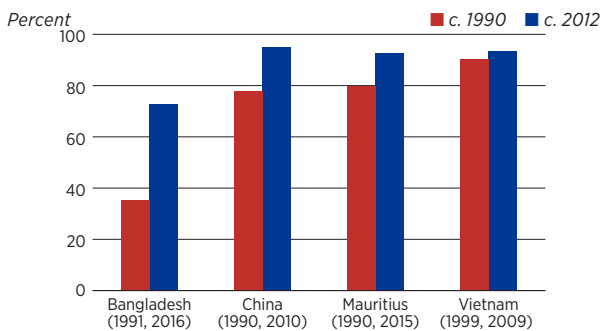
Source: Based on World Bank jobs database.
Note: Includes men ages 15 and up.

FIGURE 5
Female literacy rates in five African focus countries



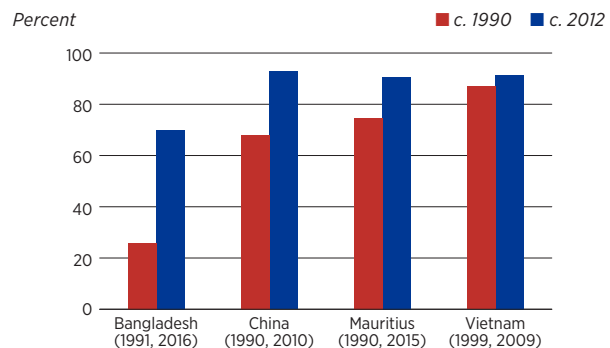
Source: Based on World Bank jobs database.
Note: Includes women ages 15 and up.

FIGURE 4
Male literacy rates in comparator countries



Source: Based on World Bank jobs database.
Note: Includes men ages 15 and up.

FIGURE 6
Female literacy rates in comparator countries



Source: Based on World Bank jobs database.
Note: Includes women ages 15 and up.

would be expected to have higher rates of employment. This, however, is not the case (table 8). For the five African focus countries, unemployment and non-labor force participation generally do *not* fall with educational attainment. In all five, the combined nonemployment rate is considerably higher for those with intermediate education than for the population as a whole. Except for Ghana, those with higher education have a nonemployment rate lower than those with intermediate education but higher and often considerably higher than the population as a whole. The higher nonemployment rates for the more educated reflect both higher open unemployment and higher non-labor force participation rates. For example, in Benin, the nonemployment rate for those with higher and intermediate education exceeds 50 percent, above the rate of 31 percent for the general population.

The situation is similar for Bangladesh, with very high nonemployment in general, even higher for those with intermediate and higher education (table 9). Viet Nam, on the other hand, has a very high participation rate for those with higher education. Thus, higher educational attainment by itself is important but not sufficient for landing a good job. Similarly, in North Africa, the African Development Bank reports that only 30 percent of young people with some tertiary education hold wage employment, while another 30 percent are in vulnerable employment, and the remaining 40 percent are unemployed, inactive, or discouraged. In North Africa, open unemployment also rises with educational attainment.¹⁰

Most enterprise surveys identify the lack of several key competencies in the workforce as a major constraint, despite rising educational attainments. This reflects the fact that the curricula in African schools are not well adapted to the labor market, although enrollments in secondary and higher education have risen impressively. And vocational training has lagged and is often poorly designed.¹¹

One study found that the Senegalese tuna fishing industry hired expatriate technicians with salaries up to 15 times higher than their local

counterparts, who lacked the requisite skills.¹² Recent surveys corroborate these findings. Africa lacks formal training programs for craft tradesmen such as plumbers, carpenters, mechanics, and electricians. Instead, workers learn skills through ad hoc training schemes such as apprenticeships, or in informal schools run by religious groups or charities.

Policy recommendations

Both general and vocational education must be targeted more at providing skills that enhance employment prospects. The education system remains oriented toward preparing students to be civil servants and fails to foster entrepreneurship. Yet, self-employment, almost all of it informal, constitutes more than 60 percent of employment in Africa. These informal entrepreneurs are industrious, willing to take risks, resilient in the face of the adverse business climate, and adept at providing goods and services that low-income people can afford. Much training takes the form of apprenticeships in the informal sector, often offered through Koranic schools or facilitated by kinship groups for their members.¹³ Nevertheless, without formal training in finance, management, and accounting, these businesses have limited potential to grow and expand employment.

INCREASING LABOR DEMAND IN AFRICA

Increasing labor demand is the overriding priority since higher education by itself is insufficient when firms are not hiring.

Analytical framework

Lewis's 1954 dualistic labor market model and its extensions

The Lewis model still provides the essential framework for understanding African dualism as resulting from low demand for labor in the modern sector (see the annex).¹⁴ The model features a large traditional sector with subsistence incomes

and a small modern sector paying much higher wages. The process of economic development involves expansion of the modern (formal) sector, gradually absorbing surplus labor from the subsistence (informal) sector. In 1970, Harris and Todaro elaborated Lewis's dualistic labor market model to include large-scale urban unemployment and underemployment, making migration endogenous.¹⁵ Surplus rural labor migrates to the higher-paid urban (modern) sector as long as the expected urban wage is higher than the rural wage. Migration ends when unemployment rises enough that the probability of a finding a high-paying job falls enough to equalize expected urban and rural wages. In 1975 and again in 1990, Fields extended the Harris–Todaro model by distinguishing unemployment and informal employment, so that the labor force includes four groups: workers in the urban modern sector, workers in the urban informal sector, the urban unemployed, and farmers in subsistence agriculture.¹⁶ In Fields's model, taking a low-paying urban informal job makes it easier than remaining in the countryside to search for a modern-sector job.

Fields's framework implies that urban informal earnings are below rural incomes.¹⁷ In reality, informal earnings are higher in urban areas than in agriculture, although urban informal earnings they could be lower, considering the higher pecuniary and non-pecuniary costs of urban living relative to village life.¹⁸

The Harris–Todaro and Fields' extensions highlight surplus labor manifested in subsistence agriculture, open unemployment, and urban informal employment. But the scarcity of high-paying modern sector jobs, as stressed by Lewis, remains the central problem underlying dualism.

The labor market reinterpreted under globalization

Lewis focused on labor in a closed economy, but historical experience highlights how labor-intensive exports boost income and employment. In successful emerging economies—Botswana and Mauritius in Sub-Saharan Africa; Chile and

Mexico in Latin America; and Bangladesh, China, Malaysia, and Viet Nam in Asia and Southeast Asia—exports played a leading role in long-term growth, sparking a cycle of investment, innovation, and poverty reduction.¹⁹ Most of these transformations began in labor-intensive industries and proceeded to higher-technology production. Other parts of Africa have made some progress in this area, but the continent still has far to go to attain international competitiveness and thus boost investment and job creation. While African exports—notably to China—have boomed, they are concentrated in capital-intensive mining and energy, creating few jobs.

Although the many informal sector workers in Africa have earnings as low as those of apparel workers in Bangladesh, Cambodia, and Viet Nam, little labor-intensive manufacturing has shifted to Africa as wages have risen in China and other East Asian countries. The scarcity reflects Africa's unit labor costs in formal manufacturing due to high formal sector wages.²⁰ It also reflects overvalued exchange rates, low labor productivity, and continued infrastructure and business climate deficiencies, most importantly in the notoriously expensive and unreliable supply of electric power. Africa could become competitive in light manufacturing, but only if productivity grows and formal sector wages align more closely with informal sector earnings. This would require easing labor market restrictions, ramping up infrastructure investments, and renewing efforts to cut red tape and reduce the harassment of formal sector firms.

Besides industrialization, boosting productivity in agriculture provides a possible path for modernization, shifting labor demand within the rural sector. Many analysts still see manufacturing as crucial for Sub-Saharan Africa,²¹ and much attention now focuses on raising the productivity of the urban informal sector.²² But others instead suggest agriculture, forestry, and tourism as opportunities for growth.²³ Urban informal sector products are predominantly nontradable services and artisanal manufacturing, with minimal exports.

TABLE 8
Labor force participation, unemployment, and nonemployment in African focus countries

Percent

Country and statistic	Non-labor force participation rate	Unemployment rate	Nonemployment rate
Benin, 2011			
Total population	29.1	1.9	31.0
Basic education	27.8	—	—
Intermediate education	58.7	3.5	62.2
Higher education	43.9	9.1	53.0
Burkina Faso, 2014			
Total population	33.3	4.3	37.6
Basic education	50.4	—	—
Intermediate education	61.4	4.3	65.8
Higher education	52.4	7.9	60.3
Ethiopia, 2012			
Total population	16.6	4.3	20.9
Basic education	38.8	—	—
Intermediate education	39.4	14.7	54.1
Higher education	5.7	16.6	22.3
Ghana, 2015			
Total population	23.3	1.7	24.9
Basic education	34.5	—	—
Intermediate education	35.8	9.8	45.6
Higher education	19.7	4.7	24.5
Senegal, 2015			
Total population	43.1	2.8	45.8
Basic education	67.4	—	—
Intermediate education	76.0	2.8	78.8
Higher education	43.3	8.1	51.4

Source: Based on World Bank jobs data.

Note: For working-age population. Nonemployment is non-labor force participation plus unemployment.

— is not available.

Traditional and nontraditional agricultural cash crops, however, offer a viable alternative to manufacturing for labor-intensive export-led growth.²⁴

Seeking global comparative advantage

Although a broad consensus encourages low-income countries to accurately identify a niche of global comparative advantage and create a friendly investment environment to cultivate it, multiple viewpoints compete on how to achieve this goal. The conventional strategy is to focus on economy-wide improvements to the business climate, with both concrete and intangible features such as

maintaining ports, increasing access to stable electricity, curtailing corruption, and improving enforcement of contracts. Lin sorts these into “hard” and “soft” infrastructure improvements to lower transaction costs to business operations.²⁵ This approach relies on market forces to identify latent comparative advantages and enable businesses to participate in global value chains through foreign direct investment (FDI) and outsourcing, which may contribute to technology transfer and human capital development.

Not all countries, however, have followed that path to emerging market status. Adapting policies to local conditions is important.²⁶ One alternative uses industrial policy to actively develop specific industries and accelerate structural change. This strategy is based on the premise that market forces alone are inadequate because they burden first movers with excessive costs, disregard public goods aspects of information and innovation, and neglect the coordination problems of developing industries.²⁷ However, such an interventionist policy faces a key challenge in deciding which industries to prioritize and effectively implementing non-neutral policies.

Policymakers do not have a clear-cut choice. With the era of restrictive trade regimes over, African countries are left without an easily identifiable advantage over more developed nations. Increased mobility of capital and inputs allows FDI to shop around for the most favorable location, which has fragmented manufacturing across the globe.²⁸ Production now requires cooperation across different time zones, highlighting the increasing role of value chains in manufacturing.²⁹ Efficient border administration and strong telecommunication networks become crucial. In effect, the business environment itself becomes a source of competitive advantage.

A comparative analysis of the business environment

Globalization has amplified the importance of the business environment to an economy’s growth prospects. With manufacturing becoming

footloose and dynamic, developing nations seeking structural transformation must offer welcoming investment environments. Countries that correctly identify and alleviate bottlenecks for business are more likely to succeed and prosper from globalization.³⁰ When a government fails to provide public goods or harasses formal sector firms, domestic enterprises shut down or become informal and foreign investors look elsewhere. In Africa, the workforce has paid the price of an obstructive investment climate in the form of fewer employment opportunities and lower incomes.

In the long term, improving institutions and infrastructure is essential.³¹ Nevertheless, given the pervasive market failures in African economies, targeted government interventions may also be needed to jump-start economic upgrading and diversification.³²

World Bank Doing Business rankings

The 2018 World Bank *Doing Business* report measures key indicators of business regulation, focusing on areas relating to the interaction between government and entrepreneurship, especially those that can be directly influenced by policy.³³ The overall Ease of Doing Business measure ranks countries on their business environment, with the top-ranked country (number 1) having the most favorable business environment. The lower a country's ranking, the more difficult it is for businesses to flourish. This analysis compares the focus countries of Benin, Burkina Faso, Ethiopia, Ghana, and Senegal with the comparator countries of Bangladesh, China, Mauritius, and Viet Nam and with four additional countries to gain perspective, Botswana in Africa, Malaysia in Southeast Asia, and Chile and Mexico in Latin America (table 10).

All five focus countries ranked below the top 100 countries for overall ease of doing business in 2018. Only Burkina Faso and Senegal improved between 2008 and 2018, Burkina Faso by 13 places and Senegal by 22, while Benin stayed at 151. Both Ethiopia and Ghana fell notably in the rankings, Ethiopia from 102 in 2008 to 161 in 2018 and Ghana from 87 in 2008 to 120 in 2018.

TABLE 9

Labor force participation, unemployment, and nonemployment in two comparator countries

Percent

Country and statistic	Non-labor force participation rate	Unemployment rate	Nonemployment rate
Bangladesh, 2016			
Total population	43.6	2.5	46.0
Basic education	65.1	—	—
Intermediate education	71.6	4.6	76.2
Higher education	47.1	8.9	56.0
Vietnam, 2016			
Total population	21.8	1.6	23.4
Basic education	24.9	—	—
Intermediate education	29.6	1.8	31.4
Higher education	12.6	4.4	17.0

Source: Based on World Bank jobs data.

Note: For working-age population. Nonemployment is non-labor force participation plus unemployment.
— is not available.

TABLE 10

World Bank Doing Business overall ranking in African focus countries and comparator countries, 2008 and 2018

Country, by group	East of Doing Business rank		
	2008	2018	Change
Focus countries			
Benin	151	151	0
Burkina Faso	161	148	13
Ethiopia	102	161	-59
Ghana	87	120	-33
Senegal	162	140	22
Top Sub-Saharan Africa			
Botswana	51	81	-30
Mauritius	27	25	2
Asia			
Bangladesh	107	177	-70
China	83	78	5
Malaysia	24	24	0
Viet Nam	91	68	23
Latin America			
Chile	33	55	-22
Mexico	44	49	-5

Source: Based on World Bank Doing Business 2008, 2018.

Note: 2008 rankings are based on 178 countries; 2018 rankings are based on 190. The lower the ranking number, the better the business environment.

Mauritius maintained a strong position among the top 30 countries in the world in 2008 and 2018, consistently outperforming the Sub-Saharan region. Botswana dropped markedly in the rankings over the same period but remained in the top 100.

The most striking shift is for Bangladesh, which experienced a large deterioration in rank from 107 in 2008 to 177 in 2018. That subpar performance seems at odds with the sustained growth of its garment industry since the late 1970s (box 1).³⁴ With substantial manufacturing exports and an admirable growth record, Bangladesh would be expected to feature a more favorable business environment. And China, somewhat surprisingly, had an unspectacular business climate but experienced spectacular export-led growth. China ranked only 83 in 2008 and 78 in 2018—still considerably higher than the five African focus countries. The Southeast Asian comparator countries Malaysia and Viet Nam, however, had favorable business climate scores: Malaysia ranked 24 in 2008 and 2018, and Viet Nam made a large improvement from 91 in 2008 to 68 in 2018. The Latin American comparators both fell, Chile from its excellent position of 33 in 2008 to a still quite favorable 55 in 2018, and Mexico from 44 to 49.

Major constraints to business

Corruption is often viewed as a major constraint to private sector development (figure 7). In most

of the focus countries and comparator countries, more than a quarter of firms identified corruption as a primary impediment to growth. Only the Asian countries of China, Malaysia, and Viet Nam and Latin America's Chile had lower concerns about corruption. Concern about corruption is relatively low in Ethiopia and Senegal among the African focus countries. Corruption need not preclude economic development, as the case of Bangladesh illustrates, as long as key export industries are insulated from government harassment.

The Doing Business Enforcing Contracts ranking reveals similar ratings across regions (table 11). While Sub-Saharan Africa ranks poorly in general, the comparators, except for China, are not world leaders either—Bangladesh neared last place in both 2008 and 2018.

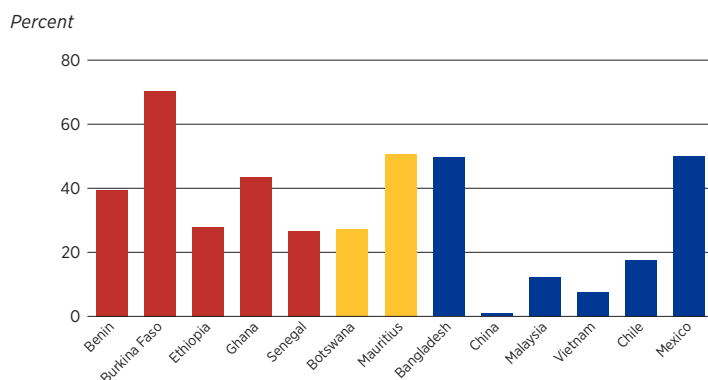
Electricity is vital to nearly every aspect of a modern economy, and its stable provision is a concrete

TABLE 11
Enforcing Contracts overall ranking in African focus countries and comparator countries, 2008 and 2018

Country, by group	Enforcing contracts rank		
	2008	2018	Change
Focus countries			
Benin	166	170	-4
Burkina Faso	109	163	-54
Ethiopia	77	68	9
Ghana	51	116	-65
Senegal	148	142	6
Top Sub-Saharan Africa			
Botswana	95	133	-38
Mauritius	78	27	51
Asia			
Bangladesh	175	189	-14
China	20	5	15
Malaysia	63	44	19
Viet Nam	40	66	-26
Latin America			
Chile	64	56	8
Mexico	83	41	42

Source: Based on World Bank Doing Business 2008, 2018.
Note: 2008 rankings are based on 178 countries; 2018 rankings are based on 190.

FIGURE 7
Share of firms identifying corruption as a major constraint in African focus countries and comparator countries



Source: World Bank Enterprise Survey data.

BOX 1

The garment industry in Bangladesh

In 2017, the apparel and textile industry in Bangladesh, the second largest garment exporter in the world after China, provided 90 percent of the country's exports.¹ Despite terrible infrastructure and prominent corruption when compared with its main competitors, the industry has grown rapidly for three decades and shows little sign of slowing down (see figure).² Such success in export manufacturing is surprising for a country with a seemingly uncompetitive business environment. But the expansion has fueled rapid GDP per capita growth, quality of life improvements, and women's empowerment.³

The positive social and economic consequences have been enormous. The industry employs about 4 million people, about 90 percent of them women. Bangladesh achieved several 2015 Millennium Development Goals ahead of schedule, including reducing under-five mortality, reducing the prevalence of underweight children, and attaining gender parity in primary and secondary education.⁴ As the garment sector expanded and the population began to urbanize, cities were flooded with unskilled labor, mostly rural women seeking employment. Their integration into economic activity led to positive changes in the political sphere and family structure: the country now features the eighth lowest political empowerment gender gap and has reduced gender-based infanticide as society shifts away from viewing women as economic liabilities.⁵

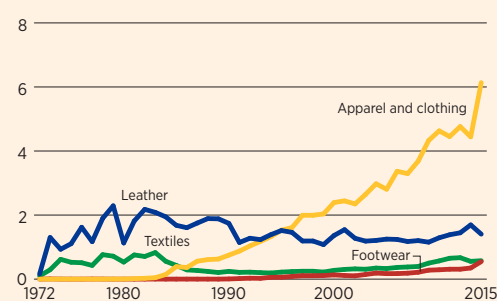
How is Bangladesh's impressive performance in garment exports possible with such low scores on business climate indicators? Favorable historical circumstances and very low labor costs have overcome other deficiencies. The development of the textile industry in Bangladesh began in 1978, when Daewoo of South Korea entered a collaborative agreement with Dosh Garments of Dhaka to start an apparel factory. While South Korean garments faced trade restrictions in Organisation for Economic Co-operation and Development countries through the Multi-Fibre Agreement (MFA), which set strict import quotas on international textiles, Bangladesh was not subject to such constraints and featured access to cheap labor.⁶ As part of their agreement, Dosh sent 130 Bangladeshi workers to Daewoo's state-of-the-art facility in South Korea for intensive training in sewing, factory management, and international marketing.⁷ After a few years, most of the original trainees started their own garment companies, setting off a rapid transmission of technical know-how across hundreds of factories.⁸

Bangladesh's largely unregulated labor market, with a history tracing back to before the country's independence from Pakistan, also contributed to its export-led growth. The 1947 Industrial Disputes Act restricted Indian and Pakistani firm's abilities to contract workers, severely limiting employment expansion. But during Pakistan's military regime, trade unions from the region that would later become Bangladesh eventually pushed the military to repeal the act, so after independence, Bangladesh inherited a labor environment better suited for manufacturing employment creation.⁹ The exceptionally low wages became more important among production costs as rising competition across all levels of the fashion industry cut into already thin profit margins.¹⁰ Despite

(continued)

Bangladesh's exports of garments and other manufactured products, 1972–2014

Percent of total world exports



Source: MIT Observatory of Economic Complexity database.

recent wage hikes in the garment sector, Bangladesh features the lowest minimum wage among its competitors, due in part to rising wages in China and Viet Nam.¹¹

Furthermore, the industry is supported by the powerful Bangladesh Garment Manufacturers and Exporters Association (BGMEA), which has been delegated administrative tasks for exports by the government and has obtained major tax breaks, subsidies, and exemptions from labor laws for the garment industry.¹² It stabilizes the industry by protecting it from crippling corruption and notoriously incompetent bureaucratic management. BGMEA and factory owners have a long-term perspective on technology absorption and extensive training programs for workers. In 2013, 85 percent of Bangladeshi workers were offered formal training, surpassing China's 70 percent. Factories have ramped up training opportunities to curb high turnover rates, in some cases investing up to two years in equipping new workers with knowledge, leading to productivity increases across the industry.¹³

In the short term, Bangladesh's garment exports are positioned for further growth. A 2017 fashion industry survey in the United States—Bangladesh's biggest export market—found nearly a third of fashion companies planned on increasing sourcing from the country in the next two years.¹⁴ But many measures of the business climate were more favorable a decade ago, and the sharp recent deterioration could reduce Bangladesh's longer-term prospects. The adverse climate faced by other industries has stifled development in both traded and nontraded sectors, such as pharmaceuticals and drug manufacturing.¹⁵

The 2012 Tazreen factory fire and 2013 Rana Plaza tragedy placed Bangladesh labor standards under international scrutiny and rightly placed garment manufacturers under intense pressure to improve worker safety.¹⁶ Stories of gross negligence, harsh labor conditions, and child labor practices have been exposed and condemned the world over and are going to gradually force an evolution from a model based on low labor costs.

Bangladesh's potential for export diversification and continued rising living standards will likely require substantial improvements in infrastructure and governance. In the long term, reliable electricity, good roads, and transparent government administration are essential.

Notes

1. International Trade Center n.d.
2. Mottaleb and Sonobe 2011; World Bank 2018.
3. Basu 2018.
4. UNDP 2015.
5. Khatiwada 2014; World Economic Forum 2017a.
6. Rhee 1990.
7. Mottaleb and Sonobe 2011.
8. Rhee 1990; Yunus and Yamagata 2012.
9. Basu 2018.
10. International Labour Organization 2014b.
11. International Labour Organization 2017.
12. Yardley 2013.
13. International Labour Organization 2017.
14. Lu 2017.
15. Asian Development Bank 2016.
16. Ahmed, Greenleaf, and Sacks 2014; Burke 2013; Lahirini 2018.

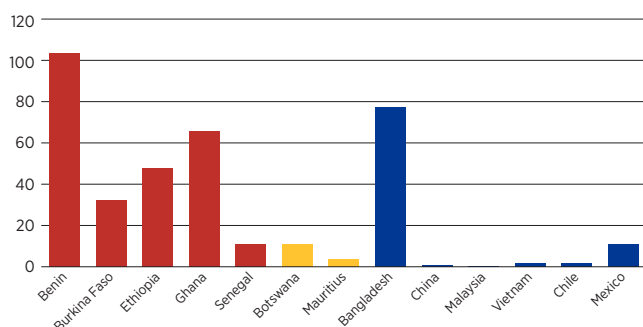
measure of infrastructure quality. Reliable access to electricity is severely lacking in the focus countries of Benin, Ghana, Ethiopia, and Burkina Faso—demonstrating inferior infrastructure in need of modernization—but not in most of the comparator countries (figure 8). Bangladesh is again an outlier among comparators, featuring the second

highest rate of outages across focus and comparator countries.

Labor market regulations could be a concern, especially for labor-intensive industries. The prevalence of firms in a country identifying labor regulation as a major constraint vary among focus

FIGURE 8
Reliable access to electricity in African focus countries and comparator countries

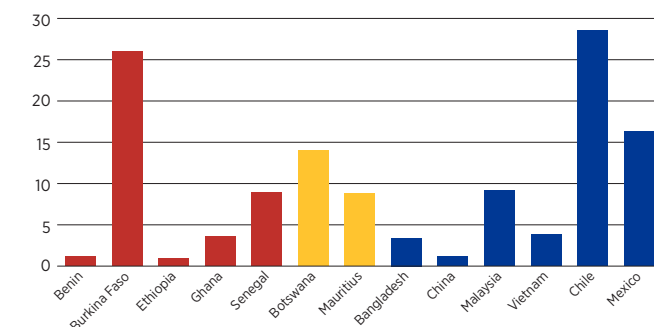
Average hours of power outages per month



Source: Based on World Bank Enterprise Surveys.

FIGURE 9
Share of firms identifying labor regulation as a major constraint in African focus countries and comparator countries

Percent



Source: Based on World Bank Enterprise Surveys.

countries and comparators (figure 9). A weighted index of labor market restrictions that covers hiring, minimum wage, working conditions, and dismissal regulations also shows surprising discrepancies (table 12).³⁵ In Bangladesh and Ethiopia, labor market regulations are not widely viewed as a major constraint, unlike some other dimensions of their business climates.

Although firms in Chile face some of the most lenient labor regulation by index and rank, the share of businesses identifying labor laws as a major constraint is the highest among the countries compared in figure 9. Benin and Ethiopia are in the reverse situation: both feature relatively high labor market regulation index scores, but few firms cite labor regulation as a major constraint.

Minimum wages show the absolute level of labor costs faced by foreign firms. Ultra-low minimum wages in Bangladesh, Benin, Botswana, Burkina Faso, Ghana, and Senegal place them at a clear competitive advantage in labor costs (figure 10).

But when minimum wages in the five focus African countries are scaled by average productivity (proxied by per capita GDP), they are very high compared with the others (figure 11). This result corroborates the findings of a 2018 study by Golub and coauthors that African manufacturing labor

TABLE 12
Indexes and rank of labor market regulation in African focus countries and comparator countries, 2015

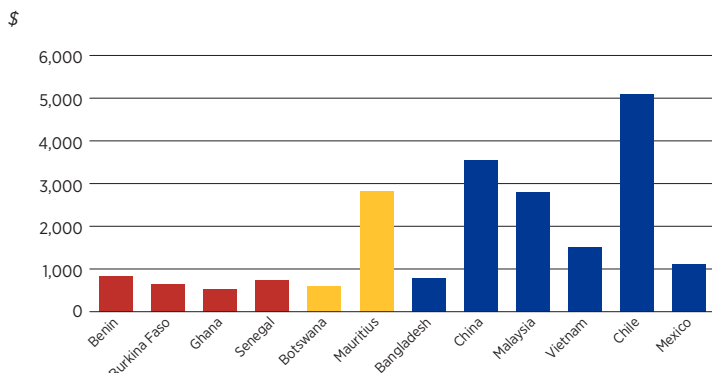
Country, by group	Labor market regulation	
	Index	Rank
Focus countries		
Benin	0.351	121
Burkina Faso	0.280	73
Ethiopia	0.339	114
Ghana	0.246	58
Senegal	0.596	187
Top Sub-Saharan Africa		
Botswana	0.205	41
Mauritius	0.301	92
Asia		
Bangladesh	0.292	38
China	0.266	67
Malaysia	0.176	21
Viet Nam	0.297	88
Latin America		
Chile	0.258	64
Mexico	0.339	116

Source: Golub, Mbaye, and Chwe (2015).
 Note: The index is on a 0-1 scale, with 0 being least regulated and 1 most regulated. The ranking is based on 189 countries, with rank 1 the least regulated.

costs are generally high.³⁶ Ethiopia was an exception, with unit labor costs as low as China's.

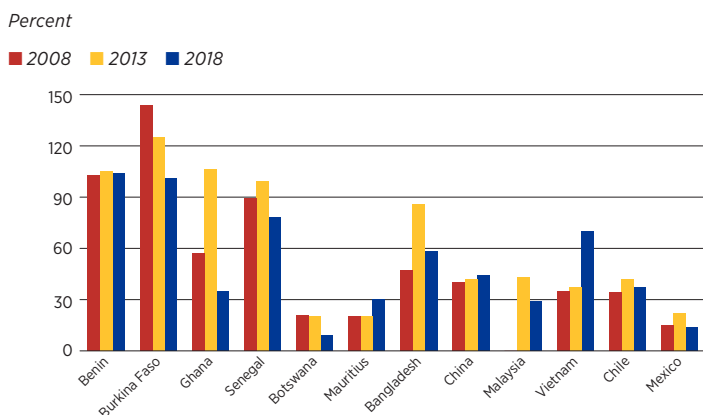
African labor costs are falling as a ratio of GDP per capita in the focus countries, while they are

FIGURE 10
Annualized minimum wage in African focus countries and comparator countries, 2018



Sources: Based on ILOSTAT data.
 Note: Bangladesh data is for garment worker wages. Ethiopia has no private sector minimum wage.

FIGURE 11
Minimum wage as a share of GDP per capita in African focus countries and comparator countries, 2008–18



Source: Based on ILOSTAT data.
 Note: Bangladesh data are for garment worker wages. Ethiopia has no private sector minimum wage.

increasing in the comparators.³⁷ Despite this convergence in wages relative to productivity, the Sub-Saharan countries of Benin, Burkina Faso, and Senegal clearly feature exceptionally high minimum wages that push employment opportunities to the informal sector, where minimum wages do not apply.

International trade

Countries can facilitate trade by lowering transaction costs for imports and exports. In the *Doing*

Business Trading across Borders ranking, the African focus countries lag far behind the comparators, with the notable exception of Bangladesh, whose position deteriorated to near the bottom of the rankings in 2018 (table 13). Botswana and Mauritius stand out with exceptionally low times to clear goods across borders (figure 12).

Overall, the five African focus countries perform worse on most measures of the business environment than the comparator countries. Countries that have successfully globalized have generally developed environments conducive to private sector development, although not necessarily in all respects or in the same ways. Evidence comes from across the globe. China in Asia, Chile in Latin America, Malaysia in Southeast Asia, and Mauritius in Sub-Saharan Africa all industrialized expeditiously and stood out among their neighbors with some combination of investing in

TABLE 13
Trading across Borders overall ranking in African focus countries and comparator countries, 2008 and 2018

Country, by group	Trading across Borders rank		
	2008	2018	Change
Focus countries			
Benin	124	136	-12
Burkina Faso	170	113	57
Ethiopia	150	167	-17
Ghana	61	158	-97
Senegal	136	135	1
Top Sub-Saharan Africa			
Botswana	145	50	95
Mauritius	17	70	-53
Asia			
Bangladesh	112	173	-61
China	42	97	-55
Malaysia	21	61	-40
Viet Nam	63	94	-31
Latin America			
Chile	43	68	-25
Mexico	76	63	13

Source: Based on World Bank Doing Business 2008, 2018.
 Note: 2008 rankings are based on 178 countries; 2018 rankings are based on 190.

infrastructure, limiting obstacles to starting businesses, enforcing contracts and trade activities, and limiting regulation of labor markets. Friendliness to markets and supportive government policies allowed businesses to build their country's niche industries, which led to a blooming of production and virtuous cycles of investment, innovation, and poverty reduction. As the countries graduate beyond middle-income status and their competitive advantages shift, they must remain open to learning and adjust appropriately.

Bangladesh appears in some respects to be a glaring exception since it rates very poorly on a substantial number of measures of the business climate and governance (see box 1). Recently the business climate has worsened dramatically in Bangladesh, and if it does not improve, long-term export diversification will almost certainly be derailed.

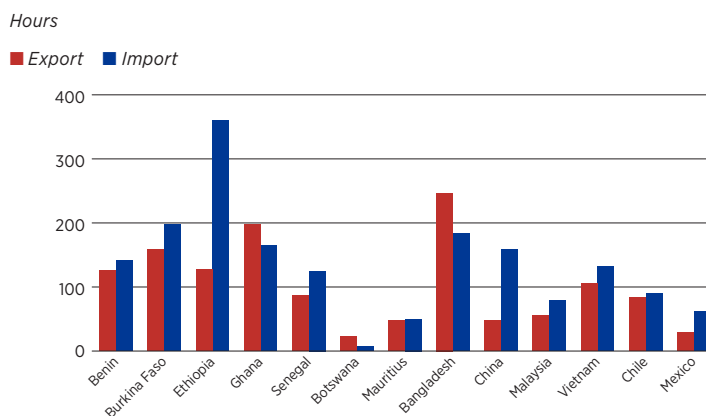
Investment climate policy

For the five African focus countries, improving governance, investing in infrastructure, and reducing impediments to business are essential. Despite low minimum wages and significant improvements in some areas (such as starting a business), Benin, Burkina Faso, Ghana, and Senegal have not enjoyed export-led growth largely because weak business environments created bottlenecks and barriers to firm entry that kept the country from experiencing sustained growth. The largest obstacles include prohibitive startup costs, terrible access to credit, and poor infrastructure quality—both hard and soft. They prevent foreign and domestic investors from exploring potential latent comparative advantages and ultimately impede private sector growth and employment generation.

Sub-Saharan countries face the challenging task of finding niche industries in an increasingly complex global market. However, the situation is far from hopeless, with Botswana and Mauritius providing examples of success. While there are multiple possible pathways to raising employment through labor-intensive export growth, improving the investment climate appears to be essential.

FIGURE 12

Time to export and import across borders in African focus countries and comparator countries, 2018



Source: Based on World Bank Doing Business 2018.

Targeted government policies to boost private sector development and exports

Structural transformation and diversification of production and exports need not await full institutional development, which can take a very long time.³⁸ Targeted policies to promote domestic business development and foreign investment can jump-start the process. Two such policies are export-processing zones (EPZs), which attempt to improve the business environment for firms in a circumscribed area, and incubator and accelerator programs, which aim to boost domestic small and medium enterprises.

Export processing zones to attract foreign investment

As the age of import substitution industrialization strategies ended and the era of globalization began, export processing zones (EPZs) quickly became the industrial policy tool of choice for developing countries seeking export-led growth. Today, even conservative estimates by the International Labour Organization estimate that more than 66 million workers are employed in 3,500 EPZs in more than 130 countries worldwide.³⁹ Maurer and Degain estimate that around one-fifth of developing country exports and almost 13 percent of their imports flow through EPZs.⁴⁰ But

BOX 2

History of export processing zones

The small Irish town of Shannon is often credited with establishing the world's first modern EPZ.¹ In 1959, in response to an economic crisis, local business leaders proposed creating a small zone near the airport where investors could benefit from lower taxation and less regulation than in other regions of the country. Once approved, the Shannon Free Zone offered lower corporate taxes, research grants for companies, and exemptions on value-added tax (VAT) for imports and goods used for export production.² The area experienced considerable growth in light manufacturing of textiles, cut diamonds, and consumer electronics, with factories employing mostly women.³ The United Nations Industrial Development Organization soon began promoting EPZs by facilitating information exchanges between Shannon and officials from China, Mauritius, and Southeast Asian countries, and their early successes quickly made them a popular industrial policy instrument.⁴

Today, although EPZs vary considerably, they typically operate under the same basic principles as the original Shannon Free Zone. Imports and exports are free of duties and exchange controls, licensing and other regulatory processes are more relaxed, and firms are exempt from VAT, corporate tax, or other local taxes.⁵ The zones generally aim to boost and diversify exports, attract foreign direct investment and generate foreign exchange, promote formal employment in a setting of high unemployment or underemployment, and serve as experimental regions and catalysts for wider economic development.⁶ EPZ achievement of these goals across the world is mixed. In some instances, EPZs have been effective at attracting FDI and generating employment, especially in East Asia and Latin America. The Chinese program in particular is hailed as a great success.⁷ But in Sub-Saharan Africa, EPZ programs have been disappointing, with only a few exceptions.

Notes

1. Zeng 2015.
2. Kennard and Provost 2016.
3. Neveling 2015.
4. Arthur 2017.
5. Farole 2011.
6. Farole 2010.
7. Farole 2011.

despite the rapid expansion of EPZs, their record of success is mixed and their effectiveness remains controversial.

EPZs aim to overcome investment constraints in a specific region of a country by providing investors with lower taxation, reliable utilities, privileged customs treatment, and so on. Improving the business climate in a circumscribed area would appear more feasible than doing so across the board.

But many Sub-Saharan countries have struggled to insulate firms in EPZs from inherently poor business environments. In some cases, although EPZs provide more reliable electricity and better roads than non-EPZ areas, the improvements are

insufficient to boost competitiveness.⁴¹ In Ghana, Lesotho, and Tanzania, EPZs perform worse than non-EPZs in critical ways, especially in export and import waiting times despite being located near major trade gateways. These problems show the difficulties of improving the business climate even within specially demarcated areas when institutions are weak.

China. China's experience with EPZs is a success story on all accounts and a prime example of using EPZs as a testing ground for innovative policies. China initially established four zones on its coasts (Shantou, Shenzhen, and Zhuhai in Guangdong Province, near Hong Kong, and Xiamen in Fujian Province, near Taiwan). Implementation varied,

ranging from free commercial zones to industrial and technology parks.⁴² Preferential policies included inexpensive land, rapid customs clearance, and unfettered repatriation of profits. In addition, the Chinese government experimented with granting local governments greater political and economic autonomy, including discretion over local tax structures and labor regulations.⁴³ Strong infrastructure and abundant labor, along with pragmatic governance, eventually attracted major FDI inflows, sparking a structural transformation unlike any the world had ever witnessed. Shenzhen, in particular, grew from a small fishing village to an industrialized metropolis within a generation.⁴⁴

Mauritius. Mauritius' EPZ is widely regarded as the most successful in Sub-Saharan Africa. After Mauritius gained full autonomy from the United Kingdom in 1968, its pro-business government sought to develop industry to diversify its monoculture sugarcane economy. An import substitution industrialization strategy failed to raise employment and drained government revenue when protected and subsidized domestic firms did not become competitive. The government then sent teams to study the export-oriented strategies of Hong Kong, Singapore, Taiwan, and other economies. The Mauritius Export Processing Zones Act was passed in 1971, offering tax holidays, the option to repatriate profits, and duty exemption on imports of machinery, equipment, and raw materials to "bonded factories," allowing them to locate wherever their needs were best met.⁴⁵ The program was a success from the start: by 1973, over 14,000 jobs and 34 new factories operated in the EPZ, mostly in apparel and textiles (see box 3 comparing EPZs in Mauritius and Senegal).⁴⁶ In 1985, Mauritian EPZs overtook sugar as the primary source of exports and employment in the country, accomplishing the main goals of diversification and employment creation.⁴⁷

Ethiopia. In late 2002, the government of Ethiopia devised a comprehensive industrial policy focused on developing agriculture and industry. Among policy instruments was the establishment of industrial zones to attract FDI, focusing

on the garment and footwear sectors.⁴⁸ The innovative program included both government- and foreign-led industrial parks operating in an EPZ-like environment, with China crucial in their financing and development. Ethiopia's program is considered to have had mixed success. It achieved rapid growth in manufacturing exports, but they remain very low in absolute terms, and recent macroeconomic pressures threaten the viability of the model and future growth prospects (box 4).

Ghana. Ghana officially instituted an EPZ program in 1994 as a response to sluggish growth. Uniquely, its program introduced "single unit" free zones, a type of licensing that allowed firms to operate anywhere in Ghanaian territory but receive all the benefits typical of an EPZ. The industrial sector initially responded positively but saw only a marginal increase in growth.⁴⁹ During the 2000s, Ghana experienced large-scale investment and export growth in its free zones program, with most FDI flowing through single unit zones. Although EPZs represent a large share of total FDI in the country, the overall level of investment remains low. Total employment generation is minimal, with EPZs accounting for less than 4 percent of industrial sector employment.⁵⁰

Senegal. Senegal offers an example of a less-than-successful EPZ program (see box 3). The Dakar EPZ was established in 1974 and became operational in 1976, but it failed to create much employment or substantially increase FDI or foreign exchange.⁵¹ The zone, much like its competitors, offered exemptions from customs duties, corporate income taxes, and taxes on machinery, along with unrestricted repatriation of capital and profits. Employment in the Dakar EPZ reached a high of 1,200 in 1986 only to fall back to 600 in 1990.⁵² The Dakar EPZ experiment ended in 1999, when it hosted only 14 active enterprises with 940 employees.⁵³ Its failure to spark employment growth reflected failure to insulate firms from labor market rigidities, high utility and transportation costs, and cumbersome bureaucratic procedures. These problems were estimated to add 25 percent to final export costs.⁵⁴

BOX 3

Mauritius and Senegal: Success and failure with export processing zones

Mauritius and Senegal's EPZ programs were in some ways similar. Both were among the earliest—only three years apart in the 1970s—and they offered similar tax incentives. The countries also have social, political, and geographical similarities. Both are very small but have favorable coastal locations for reaching developed country markets, and they have longstanding cultural and economic ties to other regions of the world. Both benefited from trade preferences in developed countries and were unconstrained by the 1974 Multi Fibre Agreement restricting textile exports. Both are among the few countries that had maintained democratic elections and ethnic harmony ever since their independence in the 1960s.

Yet the EPZ program outcomes could not have been more different. Mauritius experienced major FDI inflows, diversification of industry, and employment generation. Senegal failed by every measure.

Analyses of Mauritius' success in export diversification identified several crucial economic and political characteristics¹:

- Tax revenue from sugar exports was used to finance EPZ development and increase social spending, particularly on education, raising domestic labor productivity and easing social tensions.
- The foreign exchange value of the Mauritian rupee remained competitive.
- Infrastructure was relatively well developed.
- Domestic wage rates were kept low to promote labor-intensive industry, partially by exempting EPZs from labor legislation.

Analyses agree less on the role import barriers played. Most important, as Bheenick and Shapiro put it, "Above all, the government must be persistent, flexible, responsive, and realistic. An unwieldy and unprofessional bureaucracy, disdainful of market incentives and concerned only with limited political considerations, would almost certainly have led to failure."²

In Senegal, in contrast, economic and social policies have been much less favorable. Senegal suffered from prolonged currency overvaluation following independence, which eventually ended in 1994 with a massive 50 percent devaluation.³ Infrastructure investment and education lagged. Major policy differences from Mauritius hindered the development of domestic industry. Whereas in Mauritius, domestic firms invested heavily in the EPZ—at first in joint ventures with foreign firms⁴—in Senegal, domestic exporting firms were explicitly prohibited from entering the EPZ and faced higher taxation that increased the anti-export bias of import protection measures.⁵ More generally, firms in Senegal complained, they received the promised incentives late, if at all, and they were not in practice exempt from highly restrictive labor laws.

At bottom, Mauritius's institutional environment and political commitment were much better than Senegal's. While Mauritius was far from perfect, it featured a better business environment overall, leading to the country's description as "one big EPZ."⁶ On the other hand, Senegal's poor infrastructure, failure to deliver incentives promptly, and inability to insulate firms from onerous labor-market regulations and union agitation undermined both the zone and single-firm free trade points.⁷ The Mauritian government did what it took to make the EPZ a success. Senegal was largely stymied by powerful interest groups engaged in rent-seeking.

Notes

1. Bheenick and Shapiro 1991; Frankel 2012; Mosley 2018.

2. Bheenick and Shapiro 1991, 267.

3. Cisse, Choi, and Maurel 2017.

4. Baissac 2011.

5. Cisse, Choi, and Maurel 2017; Farole 2011.

6. Madani 1999.

7. Farole 2010.

Like Ghana, Senegal later implemented single unit EPZ licensing. In 2008, an estimated 350 firms operated on a licensing basis, compared with 50 firms in region-based EPZs.⁵⁵ Nevertheless, Senegal has yet to experience sustained growth of export-oriented manufacturing.

Characteristics of success. Numerous factors contributed to China's impressive EPZs track record—first and foremost, the government's commitment and flexibility. China forged its own path from a centrally planned economy to a market orientation, with pragmatic leadership that created a supportive business climate. For example, as part of the government's decentralization, local governments were entrusted with responsibility for roads, gas, water, sewage, telephone, electricity, and port infrastructure, funded primarily through government investment but also through public-private partnerships when faced with capital constraints. Furthermore, the local governments competed vigorously to attract private investment and typically provided services such as legal, accounting, and management consulting depending on the needs of local companies.⁵⁶ Zones offered differing packages of programs and incentives.⁵⁷

More generally, successful EPZs tend to feature, at least initially, host country government support, good infrastructure, streamlined bureaucracy, private development and operation, and open trade policy. Failed EPZs commonly suffer from subpar location, excessive bureaucracy hampering the delivery of incentives and public services, rigid labor regulations without practical exemptions for the EPZ, poor coordination between government regulators and private investors, and excessive reliance on tax holidays as a primary incentive.⁵⁸ High subsidies can lead to fiscal difficulties, support for inefficient firms, and rent-seeking behavior so that the costs of the EPZ outweigh the benefits.

Challenges for African EPZs. The unprecedented era of rapid globalization in which China and Mauritius's EPZ programs were implemented contributed to their success. Developing countries today face a more competitive environment.⁵⁹ In the earlier

time, trade regimes were more closed than today, so duty and tariff exemptions provided a straightforward competitive advantage. And EPZs were not so common, so they faced fewer competitors (but Senegal shows that being among the first was no guarantee of success). Except for Mauritius, Senegal, and, in 1974, Lesotho, African countries are latecomers, and few EPZs experience rapid growth in their first 5–10 years of operation.⁶⁰ Since most Sub-Saharan EPZs became fully operational in the mid-2000s, it is perhaps too early to classify the rest of these programs as successes or failures.

The structure of employment in EPZs has varied widely across countries but is often a source of controversy among civil society groups. The International Labour Organization stresses that working conditions and worker rights in EPZs often fail to meet world standards, especially regarding freedom of association and collective bargaining.⁶¹ In Madagascar, for example, the Free Zone has disproportionately drawn women from the low-wage informal sector to relatively well-paying export processing industries with jobs like others in the formal sector, but the zone's excessive work hours and high turnover may limit long-term opportunities for women.⁶²

In any case, the literature considers EPZs today to be a second-best intervention since they do not directly address the problems constraining manufacturing growth. Instead, they introduce distortions to the existing environment to attract investment, typically in sectors with no inherent competitive advantage.⁶³ More traditional, first-order recommendations prefer overall open trade, improved infrastructure, and high-quality institutions to the EPZ approach.⁶⁴

Even in the most successful Sub-Saharan EPZ programs, cost-benefit analyses have not clearly shown major welfare improvements. The Mauritian EPZ, despite reducing unemployment and raising foreign exchange, remains a topic of debate. A cost-benefit analysis by Sawkut, Vinesh, and Sooraj finds an overall negative effect on the country's economy, arising primarily from the

BOX 4

Ethiopia's adaptation of China's model

China has become increasingly influential development in Sub-Saharan Africa. China's structural transformation has made its economy complementary with economies in the region, because its status as a resource-scarce country with an aging population, rising wages, high savings, and infrastructure overcapacity matches well with the abundant mineral resources and underemployed labor that Sub-Saharan Africa can provide.¹ As China begins to delocalize labor-intensive activity and export its unique economic zone model, Ethiopia has been especially open to adapting it, showcasing the potential benefits and challenges for African countries that work with the Asian country.

Since the early 2000s, Ethiopia has followed a two-pronged approach to boost FDI and promote industrialization by employing both government- and foreign-led industrial parks. It has emphasized the garment, textile, and leather product industries, which are very labor-intensive and can support backward linkages to the agricultural sector. Ethiopia's history of cotton growing, spinning, weaving, and knitting, along with largely untapped live-stock resources, makes local sourcing possible.²

The government-led economic zones, such as the Bole Lemi I Industrial Zone, provide serviced industrial land, prebuilt factory facilities, and improved infrastructure, including water supply, sanitation, and electrical substations. The privately run areas, such as the Eastern Industrial Zone (EIZ), are entirely run by foreign investors: businesses are offered land on a concessional basis and given responsibility for developing infrastructure within the zone, with the Ethiopian government covering 30 percent of the cost.³ The EIZ is owned and managed by the Jiangsu Qiyuan Group, with major financial support from China in grants and long-term loans sourced from its economic cooperation zones program.

By some measures, this innovative approach to industrial policy has succeeded. Between 2002 and 2014, Ethiopia's manufacturing employment increased from fewer than 40,000 workers to more than 200,000; of that, employment in foreign-owned manufacturing grew from fewer than 3,000 to more than 50,000.⁴ In the same period, apparel and textile exports grew from less than \$20 million to nearly \$120 million.⁵ However, Ethiopia's export growth is still largely dominated by minerals and agricultural products, especially cut flowers.⁶ Skill transfer and backward and forward linkages to the local economy remain weak due to logistical issues and the inferior quality of local inputs. And China, facing rising Ethiopian public debt and foreign exchange shortages, is starting to show signs of reducing investment in Ethiopia.⁷

Notes

1. Francoise 2017.
2. Francoise 2017.
3. IPRCC and UNDP 2015.
4. Ansu, McMillan, Page, and te Velde 2016.
5. Staritz and Lindsay 2017.
6. Francoise 2017.
7. Aglionby and Feng 2018.

excessive costs of the incentives for producers in the EPZ, which were higher than the returns.⁶⁵ Cost-benefit analyses in other countries have typically found only marginally positive welfare effects.⁶⁶ Planning for EPZs should carefully weigh the benefits to be offered to investors (see box 3).

Policy recommendations for successful export processing zones. Despite the unclear evidence of their effectiveness, EPZs remain popular worldwide. In Africa, more than 10 countries have recently declared plans to expand EPZs and similar programs, and many others may have similar plans.⁶⁷

In planning these zones, policymakers should consider several important issues. First, the traditional EPZ model is unlikely to succeed in today's environment. Ultra-low tax rates and cheap surplus labor may be insufficient to create a globally competitive zone for labor-intensive manufactures such as clothing and shoes, especially since these programs continue to grow in popularity. Thus, countries must seek other niches of competitiveness. The investment climate—particularly infrastructure and trade facilitation both inside and outside the EPZ—shapes success and should be a primary focus. If a country cannot capture positive spillovers from the EPZ into the larger economy, the program risks becoming an unsustainable enclave of foreign exchange instead of a catalyst for structural transformation. Furthermore, countries that adopt a licensing or “single-firm” arrangement must address the overall business climate as a possible obstacle to investment.

Second, countries must consider potentially unsustainable costs, both financial and social, of an EPZ program. Ethiopia, for example, should see that activities in private industry-led zones align with its own interests, instead of foreigners'. More generally, countries must avoid a race to the bottom strategy featuring lavish incentives and tolerance of human rights abuses. Rather than rely on distortionary and costly subsidies, governments should ensure that costs of doing business are low and predictable through simplified procedures and efficient public services.

Third, EPZs should be considered only as part of a larger development framework. Although EPZs have an impressive potential for kick-starting growth, they are a way to experiment but typically not a way to directly generate substantial wealth. In China and Mauritius, the most successful cases, EPZs were certainly valuable for generating employment, but even more so for sparking the eventual expansion and diversification of domestic industry. To achieve this requires competent governance to identify what works in the zone and subsequently transfer those characteristics to the rest of the country or else integrate the domestic market into the region. Improving the overall business environment complements special measures in the EPZs, and a hostile environment may expose the EPZs to general risks and prevent EPZ investment from spilling over into the wider economy. Ethiopia and other countries with innovative programs show exciting potential in pursuing an improved business environment.

Incubator and accelerator programs to assist small and medium-size enterprises

Incubator and accelerator programs, which aim to boost small and medium-size businesses, are another form of targeted government policy to promote business development and foreign investment. New entrepreneurs start with few factors under their control. Historically, new firms relied on traditional sources of funding, such as bootstrapping. By minimizing personal expenses, selling personal assets, using low-cost or free techniques, and turning fixed costs into variable costs, entrepreneurs would start ventures with modest capital and little debt and build them slowly.⁶⁸ Developing a clientele usually takes a long time. During the initial period in which most businesses make little or no income, the unavoidable costs of rent, labor, capital, and marketing can lead to serious cash-flow problems in the absence of an adequate financial plan.

Business incubators. A business incubator can help newly created enterprises address some of the challenges by providing them professional advice, management tools, and pooled physical facilities.

Incubator services generally include improved access to finance and workspaces at low rents with low-cost access to telephone, internet, and electricity service. The incubator can provide the facilities and services at reduced costs because donors, or governments provide subsidies, an incubator encompassing many firms provides economies of scale, and the incubator's credibility increases bank confidence and thus firms' access to financing. Incubators also provide mentorship (learning from seasoned entrepreneurs), networking opportunities with other entrepreneurs within the same incubator, and technical support and professional services (bookkeeping, tax returns, market research, and so on).

Business incubators can influence the long-term economy because they enhance entrepreneurial culture, support new businesses with high growth potential, help new businesses establish closer ties with other entrepreneurs in the same sectors, transmit knowledge from partner research centers and universities, and thus considerably increase the rate of survival and success of small and medium-size enterprises. The longevity of businesses that graduate from these programs is a commonly used measure of success. In Canada, where over 150 incubators flourish, 87 percent of incubated businesses make it to their fifth year, compared with just 51 percent of non-incubated businesses.⁶⁹

During the 1990s, the business incubator model changed. Incubators shifted their focus from providing physical and financial resources toward offering a broader range of more intangible high value-added services.

Business accelerators. The rise of accelerator programs also provides a new focus.⁷⁰ Like incubators, accelerators support and develop new businesses. Whereas incubators are usually nonprofit entities such as universities and national or local government agencies, accelerators are for-profit venture capital organizations that provide financing, expertise, and technical and logistical support in return for a stake in the business. Whereas

incubators typically feature an open-ended timeline and are concerned with the longevity of businesses, accelerators operate on a limited timeline with a focus on growing companies quickly and sustainably.⁷¹ Accelerators can be understood as holistic business advisory services, often bearing strong resemblance to traditional management consulting practices but adjusted to fit small and medium-size organizations.⁷²

Policy recommendations for business incubators

In Africa, incubators and accelerators have both risen in popularity. Increased smartphone adoption, lower overall internet costs, and the large African market have drawn significant investment from high-profile investors and tech giants such as Facebook and Google, leading to the rapid development of what are locally known as “tech hubs” across Africa. As of early March 2018, 442 active incubators, accelerators, and co-working spaces were recorded on the continent, a 40 percent increase over the past two years.⁷³

Although incubators, accelerators, and tech hubs are relatively new to Africa, experiences elsewhere provide policy lessons. For example, some nascent firms in incubators may be incompatible with their business environment, so they can survive only inside the incubator but not outside it.⁷⁴ Recent developments suggest that organic, multistakeholder ecosystems work better than initiatives led by government, academia, or the private sector alone.⁷⁵ In general, large government assistance programs for small and medium-size enterprises have proven unsuccessful since massive template approaches miss heterogeneous business needs. Entrepreneurs are better assisted either by other entrepreneurs or by established industry experts.⁷⁶ The sheer number of tech hubs in Africa presents a considerable opportunity for improving the entrepreneurial environment, but the absence of links to academic centers of innovation is seen as inhibiting the cross-pollination of ideas and skills.⁷⁷

COUNTRY CASE ANALYSES: THE FIVE AFRICAN FOCUS COUNTRIES

Senegal

Senegal is one of the most stable democracies in Africa, with fair elections, ethnic harmony, and religious tolerance. It is well situated on the West African coast to access European and North American markets. Its limited resource endowment has shielded it from the “resource curse” of economic distortion, corruption, and violence associated with mineral rents. Although rainfall is erratic, irrigation potential is considerable. Yet, economic performance since independence in 1960 has been disappointing. Social indicators such as life expectancy and literacy have improved, but real GDP per capita is barely above the level of 50 years ago, poverty remains pervasive, and underemployment in the informal sector is the norm. At the World Bank threshold of \$3.10 a day, two-thirds of the population were poor in 2011—nearly unchanged from 2005, though somewhat better than in the early 1990s, when the poverty rate was above 80 percent.

Employment structure

Senegal’s weak economic growth, combined with unabated population expansion, has created a growing gap between labor supply and demand. Employment prospects are bleak, especially for women and young people.⁷⁸ The population increased by more than 50 percent over the past 15 years to 15.5 million in 2016, and formal employment opportunities have not kept pace. The growing working-age population has been almost entirely absorbed into the informal sector, either in agriculture or, especially, in urban informal work. As a result, living standards and economic prospects for young people are dismal. As a 2017 Millennium Challenge Corporation report points out, for much of the population, the situation has barely improved over the past 20 years.⁷⁹

Employment as a share of the working-age population in 2015 was 59 percent for men and only 32.8 percent for women.⁸⁰ Employment is

overwhelmingly informal in Senegal as in other low-income African countries. Fewer than 10 percent of the labor force are employed in the formal sector, more than 75 percent work in the informal sector, and the remaining 15 percent are unemployed (in the labor force and actively looking for work). In a working-age population of more than 8 million and a labor force of about 6 million, only 500,000 are formal sector employees receiving regular pay and benefits in the public and private sectors. Along the same lines, the National Agency of Statistics and Development reports that over 95 percent of employers and independent workers are informal.⁸¹

Labor market constraints

Over the past 30 years, employment creation in the formal private sector has stagnated, while the public sector has shed jobs. Most recently, improved economic growth in Senegal, led by non-tradable sectors such as commerce, construction, communications, and information technology, has moderately boosted formal employment. But about two-thirds of those jobs are temporary.⁸²

For women and young people, the labor market is especially difficult. In 2011, 46 percent of young people (ages 15–35) still lacked formal education, though education levels have been rising. Some 40 percent of young people classified as outside the labor market are “discouraged workers”—those who have ceased looking for work due to poor prospects. Those with jobs are overwhelmingly in the informal sector.⁸³

Although Senegal’s constitution guarantees gender equality, women and girls are disproportionately affected by poverty. Especially in rural areas, women experience discrimination in education, inheritance, and family gender roles. Women suffer from domestic violence, genital mutilation, and limited reproductive rights, including restrictive abortion regulations.⁸⁴ Women face unfair inheritance laws, have little access to formal employment, face obstacles in completing their education, and possess little authority in decisions on marriage or land acquisition.⁸⁵ More active female

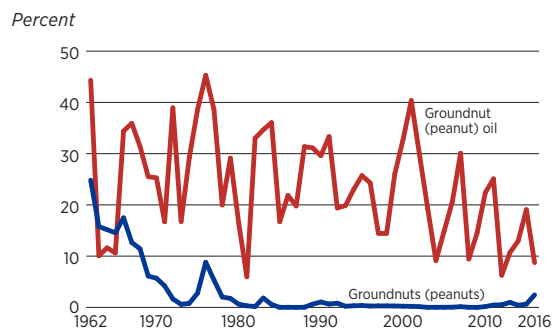
economic participation will increase women's financial independence and political power, changes that will reduce the gender gap.

Although the informal sector provides livelihoods of last resort to millions of people, it is characterized by low incomes, lack of benefits, and no security. Informal sector earnings average about one-fourth public sector earnings and one-third formal private sector earnings.⁸⁶ The unsatisfactory informal sector employment conditions and continuing gender inequalities highlight the critical importance of creating formal job opportunities.

Potential labor-intensive exports

Groundnuts. Groundnuts (peanuts) have historically been Senegal's most important cash crop, with the vast majority processed and exported as groundnut oil. Senegal remains one of the world's largest exporters of groundnut oil (figure 13), but its exports have dropped considerably due to a decline in world demand for groundnut oil and Senegal's declining productivity and competitiveness. Edible groundnuts are now a much more promising export than groundnut oil. High quality edible groundnuts can command much higher prices and therefore provide higher farmer incomes than groundnut oil. Until the 1970s, Senegal was a major exporter of green groundnuts. In late 1960s, scientists discovered that improperly stored groundnuts may develop mold that contains aflatoxin, a poisonous substance known to cause cancer. Senegal, like many other developing countries, did not have the technology and storage infrastructure to preserve the groundnuts, which led to their contamination with aflatoxin. Partly as a consequence, Senegalese raw groundnut exports declined sharply in the 1970s. The industry began to gradually recover in 2010 with exports of groundnuts to China, but exports of green groundnuts are still very limited. With modern storage technologies and increased credit, edible groundnuts would have the potential to provide much-needed employment and accelerate economic growth, but these improvements have not materialized.⁸⁷

FIGURE 13
Senegal's world market share of exports of green groundnuts and groundnut oil, 1962–2016



Source: MIT Observatory of Economic Complexity database.

The groundnut value chain, though critical for economic growth and poverty alleviation in Senegal, has proved difficult to organize. Like other cash crop systems engaging smallholder farmers, the groundnut value chain faces a fundamental tradeoff between coordination and competition in pricing, provision of credit and inputs, collection of the crop, payment to farmers, and research and extension, as Poulton and coauthors described for the cotton industry.⁸⁸ For input provision and quality control, smallholder farming requires organization and assistance by either the state or large private firms, which is difficult to reconcile with decentralized competition. Infrastructure, such as storage facilities and transport systems, is also critical. Opportunistic behavior by either farmers or input providers can threaten such an integrated system. It was hoped that privatization would improve the situation. In principle, a large multinational firm with groundnut cultivation and distribution expertise could institute an input distribution system and build some infrastructure, while government could invest in other infrastructure and regulate firms that had a substantial market share. But in Senegal, disorganization and opportunistic behavior have continued due to difficulties of enforcing and monitoring contracts, and the groundnut industry remains in crisis.

Fishing. Fishery products emerged as one of Senegal's main exports in the early 1970s, but fish

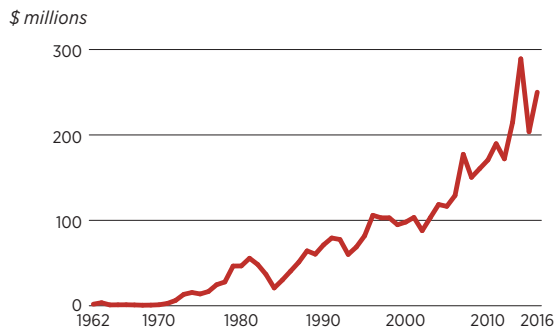
stocks are threatened by overfishing and inefficient processing. Notably, tuna canning factories have been unable to compete with Asian producers. Fish exports are still rising in absolute terms, but the viability of the sector is at risk (figure 14). The government has repeatedly announced initiatives to reduce overexploitation, but implementation has been weak.

Manufacturing. The French colonial system left Senegal with an established textile industry, but it consisted mainly of inefficient and highly protected enterprises.⁸⁹ Over the past few decades, the large textile firms have gone bankrupt. Clothing has been identified by various government administrations as possibly offering a comparative advantage, but Senegal has been unable to develop a competitive clothing industry. A weak business climate and competition from Asia undermine Senegal's comparative advantage in high-quality, African-designed printed cloth and labor-intensive garment exports.

Recently, manufactured exports have increased considerably as a share of Senegal's exports, but they consist overwhelmingly of capital-intensive goods, mainly cement and phosphoric acid and other chemicals related to processing phosphates (figure 15). Correspondingly, exports of labor-intensive products such as clothing, textiles, and footwear have dropped to near zero as a share of exports (figure 16).

Horticulture. Despite a climate and location favorable for off-season exports of horticulture products to the European market, horticulture remains underexploited. Senegalese producers face supply-chain constraints in equipment, water supply, and access to inputs. The increasing necessity of global Good Agricultural Practices quality certification and the entry of multinational firms into Senegalese horticulture have led to consolidation, but most firms remain small. Donor support for horticulture in Senegal has been so substantial that the multitude of external actors and the lack of coordination have undermined the effectiveness of aid. Land tenure and access

FIGURE 14
Senegal's fishing exports, 1962–2016



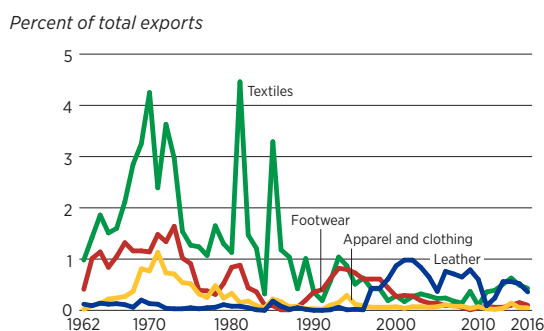
Source: MIT Observatory of Economic Complexity database.

FIGURE 15
Senegal manufactured exports, 1962–2016



Source: MIT Observatory of Economic Complexity database.

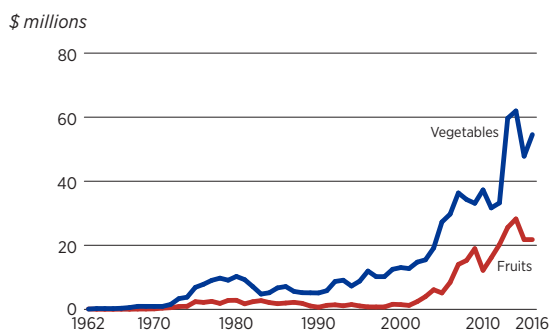
FIGURE 16
Senegal's exports of labor-intensive manufactured goods, 1962–2016



Source: MIT Observatory of Economic Complexity database.

to inputs are also issues.⁹⁰ Exports of fruits and vegetables rose until very recently but dropped during the world recession following the global financial crisis of 2008–09. Rice has emerged as an export since 2012 (figure 17).

FIGURE 17
Senegal's exports of fruits and vegetables, 1962–2016



Source: MIT Observatory of Economic Complexity database.

Policy recommendations for Senegal

In the 2000s, the governments of presidents Abdoulaye Wade and Macky Sall continued the Senegalese tradition of announcing ambitious plans to promote private sector development and transform Senegal into an emerging market economy. Wade's 2005 *Stratégie de Croissance Accélérée* (SCA) targeted industrial clusters in sectors such as tourism, agriculture, light manufacturing, and telecommunications with little discernible effect, while Senegal continued to rank near the bottom of the World Bank Doing Business indicators and other measures of the business environment. More recently, the Sall administration unveiled the *Plan Sénégal Émergent* (PSE) in 2014, which aims to make Senegal an emerging economy through high and inclusive growth, targeting similar sectors to those identified by the SCA.⁹¹ Unlike some previous plans, the PSE showed signs of success as Senegal experienced strong growth in 2015–16. Perhaps not coincidentally, Senegal's rank in the Doing Business indicators improved from 178 of 189 countries in 2013 to 147 in 2016.⁹²

Overall, Senegal's economic performance has been disappointing, despite favorable political and geographic circumstances and numerous ambitious reform plans. Senegal has made progress in opening to trade but, despite some recent improvements, ranks poorly in indicators of the business climate. Most perniciously, growth has often been limited to capital-intensive sectors. As in many

other Sub-Saharan countries, lack of employment opportunities, especially for youth and women, is the most pressing development problem. Senegal needs stronger and more labor-intensive growth. Rising growth in the past two years and the tentative emergence of new sectors with employment-generating potential have offered recent signs of improvement.

Senegal has several sectors that could expand employment. They include both traditional sectors such as groundnuts and fishing (whose continuing potential is underutilized), newly emerging export sectors such as hides and horticulture, and possibly labor-intensive manufacturing, notably clothing production (which is almost nonexistent in Senegal, but whose potential should not be abandoned). These sectors face daunting constraints in the institutional environment—red tape, excessive labor market regulations, and underinvestment in and undermaintenance of basic infrastructure.

Ethiopia

Since 1999, Ethiopia has experienced higher labor force participation, largely due to higher female participation in rural areas, and lower unemployment in both the informal and formal sectors.⁹³ Formal sector employment was less than 10 percent of the labor force in the mid-2000s.⁹⁴ Since 2010, the proportion of informal workers has declined, though the available data do not allow precise estimates.

The structure of output has shifted notably from agriculture to services.⁹⁵ From 1996 to 2011, the share of employment in agriculture declined by 3 percentage points (from 81 to 78 percent),⁹⁶ and the share of employment in manufacturing increased only slightly, from 0.2 percent to 0.3 percent.

Ethiopia's government has been attempting with some success to emulate East Asian export-led growth of manufacturing through industrial policy. Chinese investments in industrial parks have attracted a great deal of attention. But

manufacturing production and exports, while growing, remain very small, and Ethiopia's growth has been driven largely by public investment, construction, and agriculture.⁹⁷

Education and the labor market

According to the World Bank, Ethiopia is not creating enough jobs for workers with primary and secondary education.⁹⁸ In 2012, the non-labor force participation rate was 38.8 percent for workers with basic education, and the sum of non-labor force participation and unemployment was 54.1 percent for workers with intermediate education (see table 8). According to the World Bank's 5th Economic Update for Ethiopia, the service sector is the primary employer of workers with little education but accounted for only 22 percent of employment in 2016.⁹⁹

Workers with higher education also experience the consequences of the mismatch between labor supply and labor demand. Although rising college enrollments reflect Ethiopia's expansion of higher education—from 10,000 students in 1990 to more than 360,000 in 2015—the labor market has struggled to absorb them.¹⁰⁰ For instance, in the 2009/10 academic year, 66,999 students graduated from college and entered the labor force, but the country had only about 6,020 vacancies for skilled workers.¹⁰¹ The increase of college graduates is expected to continue, since more than 10 new public universities and several private colleges are planned.¹⁰² Seid and coauthors suggest that the expansion of higher education partially explains high unemployment rates and long unemployment duration among college graduates in Ethiopia.¹⁰³ The unemployment rate for workers with higher education was 16.6 percent (see table 8), and one study estimated that unemployment lasted 45 months on average among new college graduates.¹⁰⁴

High rates of unemployment can also result from a skills mismatch between job seekers and newly created jobs. According to the World Bank, manufacturing firms in Ethiopia struggle to recruit workers with sufficient technical and soft skills.¹⁰⁵

Labor productivity in manufacturing rises with education, perhaps because educated workers are easier to train or are higher-quality workers. Dinh and coauthors found that the productivity gap between Ethiopia and China is caused by less education and worse equipment for Ethiopian than Chinese workers.¹⁰⁶

Although the Ethiopian government tried to make primary and secondary graduates employable by developing technical and vocational education and training (TVET), few firms recruit TVET workers.¹⁰⁷ A World Bank survey found that only 14 of 60 firms reported contacting TVET institutions to fill outstanding technical positions, and only half of them reported hiring directly from TVET institutions.¹⁰⁸

Sectors with potential comparative advantage and employment

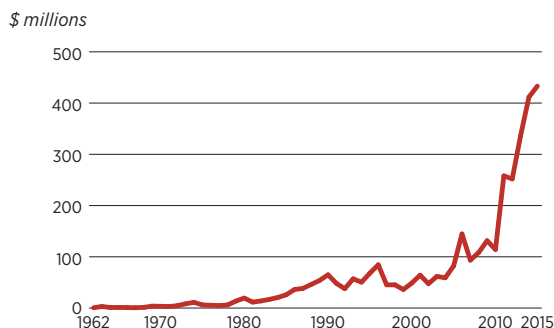
The Ethiopian government has modeled its industrial policy on East Asia's export-oriented and interventionist policies, targeting the leather, footwear, and textile industries.¹⁰⁹

Manufacturing. Government industrial policy for manufacturing has had considerably success with a boost from recent Chinese investments. Further diversification is possible. In late 2017, the Chinese pharmaceutical company Humanwell approved an investment of \$100 million in Ethiopia's pharmaceutical sector.¹¹⁰ In addition, Ethiopia received \$10.7 billion in loans from China from 2010 to 2015, most being used for Chinese infrastructure projects in Ethiopia.¹¹¹ According to the deputy commissioner of the Ethiopian Investment Commission, Ethiopia plans to create 2 million manufacturing jobs by 2025.

Although manufactured exports have increased sharply, they remained low at \$500 million in 2015 (figure 18), and they have declined as a share of total exports, reflecting booming agricultural exports.

Ethiopia has a strong comparative advantage in leather due to its huge livestock inventory and a

FIGURE 18
Ethiopia manufacturing exports, 1962–2014



Source: MIT Observatory of Economic Complexity database.

tradition of shoe manufacturing. The industry slumped in the early 2000s as cheap Chinese imports flooded the domestic market, while exports were limited by the low quality of the domestic value chain, from skinning to tanning. The government responded energetically with consulting, training, and marketing programs to boost the quality of locally produced shoes. It also set export and productivity targets and worked with firms to help them meet or readjust goals. The efforts contributed to a revival of the industry.¹¹² Leather remains the largest manufactured export, and export growth has been very strong in recent years (figure 19).

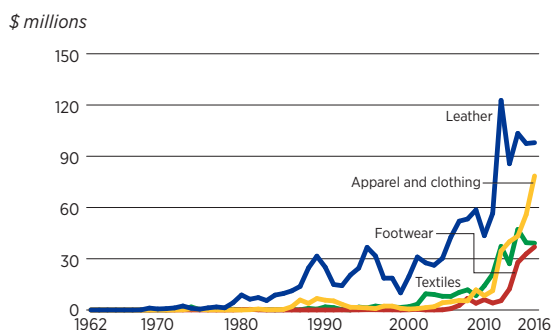
Floriculture. Investor incentives and a favorable climate have propelled Ethiopia’s cut flower industry. Floriculture has grown rapidly, with

flowers almost overtaking coffee as the main export (figure 20). The industry initially evolved without sector-specific support from the government, and unlike the leather industry, it has been dominated by foreign firms. Cut flower firms benefited, however, from the tax holidays and import duty exemptions given to all exporters. The government later built a close relationship with growers and recently created a semiautonomous agency to provide services to horticulture exporters.¹¹³ Although government incentives and services have helped the cut flower industry develop, it is unclear whether they should continue for a now somewhat developed sector. Vegetable exports have also boomed, while fruit exports are minimal.

Policy recommendations for Ethiopia

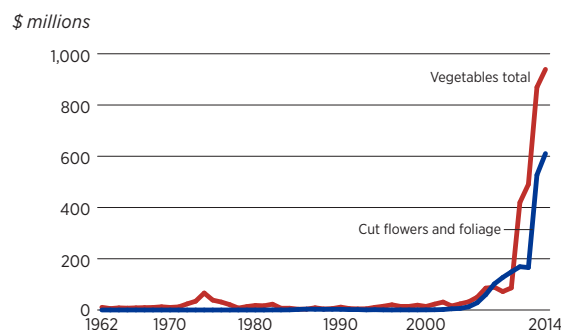
Governance has improved greatly, and Ethiopia has seen strong growth since the early 2000s. Macroeconomic management has generally been sound, and activist industrial policies along with Chinese investment have boosted export-oriented manufacturing and agriculture. In the early 2000s, the business climate improved considerably, but political unrest has since weakened it, and macroeconomic stability has come into question. Wages in the formal sector are unusually competitive for Sub-Saharan Africa, and infrastructure has improved substantially.¹¹⁴ Export diversification has made progress in recent years, with manufacturing and horticulture exports rising sharply.

FIGURE 19
Ethiopian exports of leather, footwear, textiles, and clothing, 1962–2014



Source: MIT Observatory of Economic Complexity database.

FIGURE 20
Ethiopia exports of cut flowers and vegetables, 1962–2014



Source: MIT Observatory of Economic Complexity database.

The Ethiopian government is modeling its economic strategy on activist East Asian industrial policies. Overall, the government's sector-specific interventions seem well crafted, but their effects are partially offset by general weaknesses in the business climate. The government has targeted manufactured exports, and they are growing, although from a low base. The Ethiopian government has been far more effective than most others in operating EPZs. However, the interventionist approach has downsides. Limited competition, restrictions on foreign investors, and the privileged access of large state-owned enterprises to resources and to policymakers inhibit further diversification and productivity growth. The business climate, after improving in the early 2000s, has worsened markedly, possibly discouraging further FDI. In short, the results of Ethiopia's industrial policy are promising, but a full assessment is not yet possible.

Ethiopia has succeeded more dramatically in promoting horticultural than manufactured exports. The private sector has played a larger role in horticulture than in manufacturing, underscoring the importance of fostering a dynamic private sector and supporting market forces' role in finding and taking advantage of diversification opportunities.

The macroeconomic context for export diversification is also crucial.¹¹⁵ Industrial policies will have little effect if they are offset by overvalued exchange rates and weak infrastructure. Ethiopia's 2017 depreciation of the currency is a positive step but has not completely reversed overvaluation. Further real depreciation and maintenance of a competitive exchange rate are crucial because of the risks posed by high external debt and limited foreign exchange reserves, which concern the International Monetary Fund. Competitive exchange rates, investment in infrastructure and education, and macroeconomic stability were crucial to the economic success all East Asian countries—arguably more than targeted industrial policies. The Ethiopian government has done well in pursuing these, but risks to fiscal and external balance stability require prioritization among government

investments and greater reliance on private sector investment.

For the labor market, Ethiopia should invest further in job training for workers of all education levels.¹¹⁶ Ethiopia could also support job searches by low-skilled and unemployed workers by providing safety nets, labor market programs, and job vacancy information through information and communications technology.

Benin

Employment in Benin is even more overwhelmingly informal than in other low-income Sub-Saharan countries. In 2011, a staggering 96.2 percent of Benin's nonagricultural employment was in the informal sector.¹¹⁷ That figure reflects the reliance of Benin's economy on subsistence agriculture (about 25 percent of GDP) and informal re-export trade with Nigeria (about 20 percent of GDP). Agriculture employs more than 70 percent of the economically active population.¹¹⁸

Employment in cotton

Benin relies heavily on cotton as a cash crop. The cotton value chain (production, processing, cotton oil, and research) directly provides 40 percent of rural jobs and involves 50 percent of the total population.¹¹⁹ The cotton industry makes up 13 percent of GDP, and incomes from the cotton value chain have multiplier effects on the art, transport, commerce, and construction sectors.¹²⁰

The reliance on cotton creates numerous challenges. Benin's economy is poorly diversified, has low productivity, and is vulnerable to external shocks such as unpredictable rainfall. It thus experiences volatile growth.¹²¹ Worse, the cotton sector has been in a structural crisis for two decades, and output is far below potential. In the 2000s, cotton production and exports plummeted, primarily due to domestic mismanagement of the sector (figure 21).

In the 1990s, African countries, including Benin, began to liberalize their cotton sectors, previously

FIGURE 21
Benin's share of world cotton exports, 1962–2016



Source: MIT Observatory of Economic Complexity database.

controlled by government marketing boards.¹²² Although liberalization made sense in theory, because cotton is not characterized by significant economies of scale, Benin lacked the institutions to give domestic entrepreneurs a larger role in running the sector. For instance, to purchase inputs (such as seed and fertilizer), cotton producers need access to credit, but without strong contract enforcement, banks are unwilling to lend to smallholders. In this environment, farmers have an incentive to evade their credit contracts and sell their cotton at a higher price, while cotton ginners have an incentive to poach cotton from other ginners. In addition, the government sometimes intervenes in favor of special interest groups.

The World Bank recommended clarifying the government's role and concentrating the cotton sector by consolidating into a single dominant firm the functions of ordering inputs, providing credit, negotiating prices, and establishing contracts.¹²³ But the situation has remained largely unresolved, with repeated ad hoc interventions by the government, often in favor of politically connected cotton ginning firms.¹²⁴

Employment in cross-border trade

Benin's informal sector engages in extensive cross-border trade and smuggling, mainly with Nigeria, with which Benin shares a long border. Benin re-exports imported goods to Nigeria, including, rice, cloth, used cars, and frozen poultry, to take advantage of Nigeria's very high import

barriers.¹²⁵ Benin, with relatively low tariffs, deliberately fosters a customs regime that facilitates official imports that are then smuggled into Nigeria, and the value of goods imported in transit or for re-export is more than twice the value of those imported for domestic use. In 2008, Benin's gross re-export trade made up more than 60 percent of GDP. Cross-border trade generates many employment opportunities for workers who handle merchandise at ports and transport it to Nigeria. Used car markets in Benin's capital, Cotonou, directly employ 10,000 to 15,000 people in importing, selling, storing, and driving cars, and they employ thousands more indirectly.¹²⁶ While cross-border trade is one of Benin's most important industries, it is highly vulnerable to the vagaries of Nigerian policy, and it promotes a culture of rent-seeking and illegality unconstructive for long-term development. Benin should shift to legitimate entrepôt roles by improving its port and trade institutions and infrastructure and cracking down on smuggling.

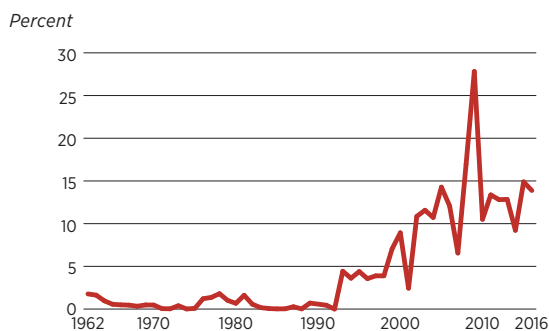
Export diversification opportunities

Over the past decade, Benin's economy has faced a challenging business environment and volatile growth caused by weaknesses in education, total factor productivity, and public investment efficiency.¹²⁷ It remains a low-income country with annual per capita income of \$790 in 2015.

Diversifying agricultural exports could raise growth rates, reduce output volatility, and improve within-sector productivity.¹²⁸ Consolidating cotton exports and expanding cashew and pineapple exports present possibilities. Benin's nut exports, mainly cashews, have recently increased (figure 22). However, some of those exports may be lower quality cashews smuggled from Nigeria. Benin, like other African producers, does very little domestic processing, but improved infrastructure and technology could increase cashew production and support domestic processing for export.¹²⁹

Pineapples have also long been identified as a product in which Benin has a strong comparative advantage, but progress has been limited. Benin has

FIGURE 22
Share of edible nuts in Benin's export value, 1962-2016



Source: MIT Observatory of Economic Complexity database.

distinctively favorable soil and climate conditions for growing pineapples, which have a reputation for very good flavor. Scaling up production is limited by deficient quality control and infrastructure, such as cold storage facilities. The underlying problem for cashews, cotton, and pineapples is the deterrent to agriculture and agro-processing posed by weak policies and institutions in an environment dominated by rents from cross-border trade.¹³⁰

Policy recommendations for Benin

Employment in Benin is dominated by informal labor in cotton cultivation (in the agricultural sector) and cross-border trade (in services). Both of these key sectors are precarious, with considerable potential for raising employment and incomes if reformed.

Stabilizing the cotton sector is the top priority. Benin has a strong comparative advantage in cotton, but the sector's current structure does not optimize the tradeoff between competition and coordination that is at the heart of agricultural value chains. In some respects, Benin now suffers from the worst of both worlds: limited competition and limited coordination due to weak institutions for enforcing compliance. Compliance in the sector could become more self-enforcing by a move toward a more concentrated but market-driven system, obviating the need for an elaborate institutional structure. Many people employed at all levels of the value chain would benefit.

The re-export trade's dynamism, ingenuity, and organizational sophistication indicate a high potential for a thriving market economy. In some ways, infrastructure such as border storage depots and institutions such as import value chains operate far more efficiently in the re-export trade than in the formal economy. Benin's challenge is to channel this energy and creativity in a more sustainable direction. Benin is well placed to serve as a regional trading and service center, benefiting from its proximity to Nigeria, but it must do so legally within the rules of the Economic Community of West African States (ECOWAS). Competitive advantage as a regional trading hub will require an improved business environment. Benin's infrastructure and governance, though better than Nigeria's, are deficient. Benin's low-quality public services extend to the port and customs administration, whose quality is critical for a country with ambitions to serve as a trading center.

To reach emerging market status, Benin must develop its capacity to produce goods and services for regional and international markets, instead of just transshipping goods produced elsewhere. Agriculture offers promising diversification opportunities, notably in pineapples and cashew nuts, but they too are stymied by the weak investment climate. The industrial sector currently makes up only 13 percent of GDP, driven mostly by cotton ginning. Developing a stronger industrial sector could raise productivity in Benin, but thus far pervasive smuggling, low education levels, and poor institutions have impeded that. Escaping the culture of rent-seeking and illegality, developing sustainable business in formal industry and commercial agriculture, and creating employment require improving infrastructure, adopting financial system reforms, and strengthening property rights protection.

Burkina Faso

Burkina Faso's landlocked economy relies largely on agriculture, which employs almost 80 percent of the economically active population. Exports have historically concentrated on cotton, but the

country has experienced a rise in gold mining in recent years. The manufacturing and industrial sectors are underdeveloped, and the services sector, consisting primarily of informal activity in urban areas, is the largest contributor to GDP.¹³¹ In 2016, 91.5 percent of total employment was classified as vulnerable, meaning the sum of own-account workers and contributing family workers.¹³² Among women, 93.1 percent are in vulnerable employment, and among men, 86.7 percent.¹³³ The threat of Islamic terrorism remains a concern, though political stability has been restored.

Employment in cotton

Since 2000, Burkina Faso has been one of the top 10 global exporters of cotton, and it has become the largest African exporter.¹³⁴ Cotton is an important source of employment along all parts of the production value chain. Burkina Faso has created a more successful institutional framework than most other African producers of cotton, particularly Benin. Burkina Faso's share of world cotton exports has grown steadily (figure 23), unlike Benin's.

However, cotton-led growth faces several challenges.¹³⁵ First, although cotton's profitability is uncertain in the volatile world commodities market, cotton represents about 60 percent of Burkina Faso's total exports. Second, increased cotton production in the 2000s relied on the accumulation of

factors of production (land, labor, and inputs), not increases in productivity. Improving technology in agriculture and the overall economy would generate more sustainable growth but is constrained by corruption, high tax rates, low education levels, and limited access to electricity. Furthermore, although cotton sector growth could spill over into more productive sectors such as textiles, these sectors would need to be expanded first.

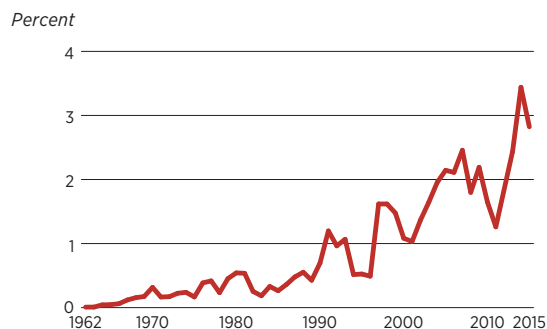
Sources of export diversification

Agriculture provides Burkina Faso's most promising sources of export diversification. The country has a comparative advantage in several fruits and vegetables such as beans, onions, tomatoes, and especially mangoes. Recently, horticultural exports have been boosted with World Bank assistance.¹³⁶ Vegetable and especially fruit exports have risen sharply in recent years (figure 24), and farmer incomes have risen substantially. Nevertheless, the amount of exports remains small, and most agriculture is still subsistence farming.

Burkina Faso is attempting to develop EPZs and growth poles. Several EPZs in the capital, Ouagadougou, have had limited success.

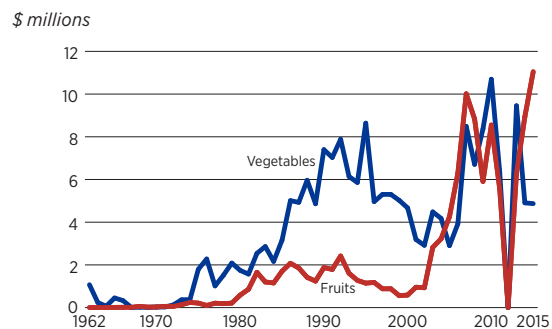
Regional growth poles are perhaps more promising in an agriculture-based economy such as Burkina Faso. The World Bank has worked closely with the government to develop a growth pole in

FIGURE 23
Burkina Faso's share of world cotton exports, 1962–2014



Source: MIT Observatory of Economic Complexity database.

FIGURE 24
Value of Burkina Faso exports of fruits of vegetables, 1962–2014



Source: MIT Observatory of Economic Complexity database.

the Bagré region—to improve the business environment, develop critical infrastructure, and provide services to small and medium-size firms.¹³⁷ The project aims to increase jobs, agricultural production, and private investment. It is slated to close in November 2020. The strategy centers on developing roads and constructing a dam for hydroelectricity, as well as on simplifying the land tenure system to provide land to smallholders and ease access for larger investors establishing plantations. The project is also developing storage facilities and markets, aiming to privatize them eventually.¹³⁸ Although very promising, the project has experienced delays, cost overruns, and controversies about displacing small farmers. Private sector investment has been slower than hoped. But the World Bank argues that the project has substantial potential and offers a model for developing other growth poles. In March 2018, arguing that additional financing can address the project's problems, the World Bank approved an additional \$50 million.¹³⁹

Youth education and employment

Youth education levels are particularly low in Burkina Faso. The youth literacy rate was only 50.1 percent in 2014, whereas the Sub-Saharan average is 71 percent.¹⁴⁰ Only 28 percent of students meet math and reading competence requirements after completing their primary education.

Although youth literacy is low, youth employment is relatively high, reaching 42.1 percent of those ages 5–14.¹⁴¹ Youth work in carpentry, cotton harvesting, and, increasingly, gold mining. But child trafficking and sexual exploitation are also common in Burkina Faso, reflecting the paucity of remunerative activities. The World Bank's Burkina Faso–Youth Employment and Skills project, slated for completion in December 2018, aims to increase access to temporary employment opportunities for not-in-school youth, mainly through labor-intensive public works.¹⁴²

Policy recommendations for Burkina Faso

Burkina Faso is overwhelmingly agricultural, and efforts should focus on raising incomes through

higher quality and value chain productivity for cotton and other export crops. The country has boosted cotton exports and diversified agricultural exports into horticulture, but much agriculture remains subsistence-level production. Further growth is promising due to strong European and regional demand for products in which Burkina Faso has comparative advantage, notably mangoes and cashews. The European market, supplied by both sea and air routes, is lucrative, and Burkinabe mangoes could be highly competitive if production and distribution improve. Increased export of onions to regional markets also has considerable potential.

Further progress will require more institutional support for farmers and investment in infrastructure, notably irrigation. Until recent unrest, Mali made important progress in these areas, which Burkina Faso could emulate. Quality norms in developed country markets, a major challenge to scaling up fruit and vegetable exports, call for increased foreign investment and technical assistance. The government should streamline certification for exporters, working with private and official foreign organizations.

Burkina Faso's authorities should also promote the processing of agricultural commodities, especially cotton. Although Burkinabe textile production seems unlikely to be competitive anytime soon, other cotton products such as animal feed and biogas could create employment.

The Bagré growth pole is an interesting innovation that could provide lessons on targeting a region for a big push in infrastructure development and thus attracting private investment.

Ghana

Until recently, Ghana's progress in GDP growth and job creation have been among the best in Sub-Saharan Africa. In 2007, Ghana attained middle-income status when its per capita GDP exceeded \$1,000. In 2011, it reached a peak GDP growth rate of 15 percent, although that figure was driven

primarily by a recalculation of GDP that included sectors not previously counted.¹⁴³ From 1991 to 2012, the share of its population living in poverty dropped from 52 percent to 24 percent.¹⁴⁴ At the same time, the share of employment in agriculture fell from 61 percent to 24 percent, while the share of employment in services rose from 36 percent to 48 percent.¹⁴⁵ Accompanying sectoral transformation, job creation has grown consistently by 3–4 percent a year. Whether the jobs created amid Ghana's recent economic gains are high in quality is a concern.

Employment structure

Although Ghana's employment has shifted from agriculture to services, most new jobs in services have been informal and low-productivity, according to Aryeetey and Baah-Boateng.¹⁴⁶ From 1984 to 2013, the informal sector's share of employment rose from 83.8 percent to 88 percent. Earnings differentials among the informal sector, private formal sector, and public sector show the inequality that has accompanied Ghana's growth: in 2013, informal sector earnings were only 37.5 percent of public sector earnings and 32.1 percent of private formal sector earnings.¹⁴⁷

Ghana's limited creation of formal sector jobs may be due to the concentration of its economic growth in capital-intensive oil and mining, rather than in more labor-intensive manufacturing and agriculture. The World Bank's 3rd Economic Update on Ghana suggests that Ghana could be suffering from early-stage Dutch disease.¹⁴⁸ As evidence, the economic update observes that the rise of extractive industries seems to be limiting growth in agriculture. In 2011, when Ghana began oil production, the agriculture sector grew by only 0.8 percent while the industrial sector grew by over 41 percent. Over 2010–16, the share of agriculture in GDP fell from 29.8 percent to 18.9 percent, while the services and industrial sectors both benefited from the oil and gas boom.¹⁴⁹

Labor market constraints

To combat growing inequality and become a modern middle-class economy, Ghana will need jobs

that are productive, better quality, and higher paying. Ghana's business environment remains quite unfavorable, though better than many in Sub-Saharan Africa. The two largest constraints on firm productivity are access to credit and to technology.¹⁵⁰ Firms in Ghana, especially micro and household enterprises, face high interest rates and struggle to invest in technology while covering the costs of trade. The constraint cited second most frequently by firm managers was inadequate electricity supply: without power, firms cannot take advantage of information technology or capital equipment to produce at night.

To absorb the increasing number of entrants to the labor market, Ghana will need to create 300,000 jobs a year.¹⁵¹ Creating more productive jobs also requires educating the labor force for them. On the supply-side, Aryeetey and Baah-Boateng argue, the low quantity and quality of education, as well as the skills mismatch between supply and labor market demand, constrain job opportunities.¹⁵² According to their findings, 8 of 10 Ghanaians have less than a secondary education, but most job openings in the formal sector require at least a secondary education. Although education levels have increased in Ghana, the quality of education is low—in 2010, one in five third graders could not read a single word, and one in five could not perform subtraction.¹⁵³ Even students with secondary and higher education have high rates of non-labor force participation, showing the failure of education to provide skills that employers seek.

Corroborating the skill mismatch, Aryeetey and Baah-Boateng found that Ghana has a shortage of high-skilled and semiskilled workers.¹⁵⁴ They cite anecdotal evidence that when Ghana started commercial oil production, the industry relied on workers from Côte d'Ivoire and Nigeria for engineering, drilling, production, and operation because Ghana lacked workers with those specialized skills. In 2012, 45 percent of workers were underqualified for their jobs, 49 percent were correctly matched, and only 6 percent were overqualified.¹⁵⁵

Sectors with potential comparative advantage

Gold. Gold has become Ghana's largest export, but gold mining is not labor intensive.

Cocoa. Ghana is one of the world's leading producers of cocoa, but its world market share is well below its level 30 years ago (figure 25). Cocoa farming is relatively lucrative, and poverty is low among cocoa farmers. However, production has declined. The World Bank faults the price-setting and organizational functions of Cocobod, the Ghanaian government marketing board.¹⁵⁶ Cocobod provides stability to the system, pays farmers promptly, and has raised quality so that Ghanaian cocoa receives a small premium over world prices. Nevertheless, implicit taxation of farmers is higher than in Côte d'Ivoire and Asia. Providing more autonomy to farmers and reducing the government's implicit taxation of cocoa exports would encourage farmers to expand production and quality and boost producer incomes.

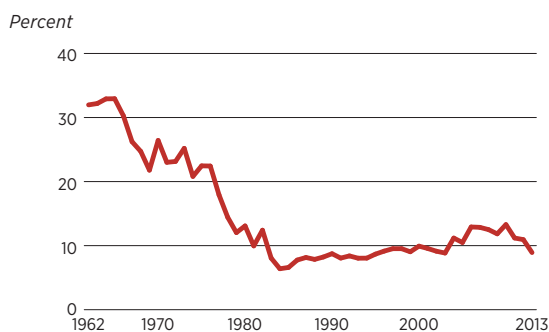
In the longer term, a general modernization of the cocoa sector through more capital investment (mechanization) and more skilled labor would raise productivity and incomes. The average cocoa farm is less than 50 acres, and the average age of cocoa farmers is above 50. Land tenure is contentious because of chieftaincy disputes, making it difficult to develop large-scale farms. Ghana's neighbor, Côte d'Ivoire, by mechanizing cocoa

farming, has surpassed Ghana's production. Also, Ghanaian cocoa farmers have less than a secondary school education on average, making it difficult for new improvements in farming to catch on.

Horticulture. Ghana has enormous potential in horticulture. Pineapples, in particular, are regarded as promising, and pineapple exports to the European Union grew rapidly between 2000 and 2010. But a new variety developed in Costa Rica in the mid-2000s has proved very popular in Europe. The drop in demand for Ghanaian pineapples, along with difficulties in meeting European quality norms, led to a steep decline in Ghana's fruit exports after 2010 (figure 26). Vegetable exports have also dropped.

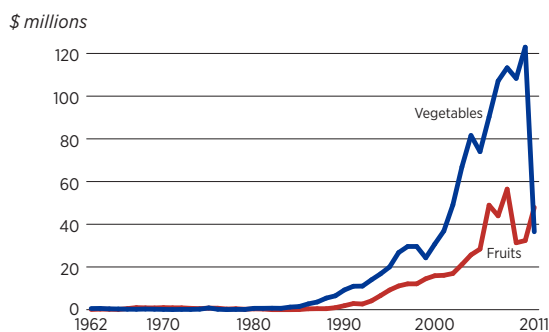
Horticultural performance has been constrained by a low-end strategy, which enabled exports to the European Union at low prices but earned Ghana a reputation for poor quality. External assistance is needed to repair the sector's interrupted cold chain, which contributes to that negative image and constrains horticultural development in Ghana and elsewhere in Sub-Saharan Africa. Quality standards and Good Agricultural Practices certification, which have been reached by the largest exporters, must be extended to all horticultural players through donor-funded awareness programs and technical support. Although external aid is crucial, Ghana suffers from an ill-coordinated overabundance of external support

FIGURE 25
Ghana's share of the world cocoa market, 1962–2016



Source: MIT Observatory of Economic Complexity database.

FIGURE 26
Ghana's exports of fruits and vegetables, 1962–2012



Source: MIT Observatory of Economic Complexity database.

agencies and their domestic partners, many of them ineffective.¹⁵⁷

Services. Ghana may do better in developing services than manufacturing. Given many English-speaking graduates, such services as tourism and business process outsourcing have high potential. The tourism sector is, however, underdeveloped compared with that in other African countries, and the government seems unaware of the employment opportunities and foreign exchange flows tourism brings. Attracting outsourcing services, such as call centers, is impeded by weak telecommunications infrastructure. Unions that agitate for higher wages are also viewed as a problem.¹⁵⁸

Policy recommendations for Ghana

To improve the quality of jobs as its population continues to grow, Ghana should create more jobs in the formal sector and more productive jobs in agriculture and the informal sector, where most Ghanaians work. To improve informal sector productivity, Ghana should adopt policies that upgrade technology, improve access to markets, and provide better access to credit.¹⁵⁹

The government needs a more nuanced policy for the informal sector, assisting small firms with financing and capacity building while forcing large firms to register and pay taxes. The Francophone countries of West Africa have instituted a two-tiered framework for formal and informal firms that taxes informal firms at a low lump sum. Although that scheme is far from perfect, Ghana could benefit from moving in a similar direction.

Improved education and infrastructure are key for boosting labor-intensive exports in services, agriculture, and manufacturing. Investing in education to improve the labor force's skills would be vital to meeting labor demand in new and more productive jobs.

Ghana's strongest comparative advantage is in agriculture and agro-processing. Mechanization and increased use of skilled labor would boost agricultural exports. Cocoa farming, even with

some mechanization, is labor-intensive, holding the potential to create high-paying jobs and reduce poverty. Although Cocobod's management of the cocoa sector has some significant advantages, increased farmer autonomy and reduced implicit taxation would foster greater production and quality. Processing agricultural produce can create synergies between agriculture and manufacturing.¹⁶⁰

For nontraditional export crops such as horticultural products, attracting more foreign investment offers opportunities for building skills and market access. Multinational food distributors have the know-how to form outgrower networks with small farmers that boost productivity and quality.

The government should encourage young university graduates to enter cash crop farming in cocoa and horticulture. Publishing data on earnings in cash crop farming would be one simple step. If young people perceive the returns on farming to be high, they will enter farming rather than migrate to cities.

Ghana, as an English-speaking country with good political and economic stability, has high potential for tourism and exports of business services. These sectors particularly would benefit from improved education and infrastructure investment, especially in telecommunications.

CONCLUSIONS AND POLICY RECOMMENDATIONS

Low- and low-middle-income African economies have a massive underemployment problem. Approximately 90 percent of the labor force is employed in the informal sector, with very low wages, no social protections, and irregular working hours. Thus, poverty levels remain elevated and social discontent simmers in the face of limited opportunities, especially for women and youth.

This study has described the conditions of the labor market and attempted to diagnose the underlying

causes of underemployment. It has focused on five Sub-Saharan countries: Benin, Burkina Faso, Ethiopia, Ghana, and Senegal, and four comparator countries that have achieved poverty reduction through rapid absorption of the labor force into formal sector employment. The analytical framework identifies supply-side and demand-side constraints on employment using a combination of quantitative and qualitative approaches.

Supply side

On the supply side, the labor market confronts working-age populations that are growing rapidly with little evidence of a major demographic transition toward lower population growth. Although educational attainment has improved significantly in the African focus countries, it lags behind that in the comparators. Alarmingly, workers with secondary and tertiary education have high levels of nonemployment—they are out of the labor force or unemployed—suggesting that higher levels of education alone do not guarantee employment. That shows the importance of improving the quality of education as well as its quantity. The education system often fails to impart the practical skills sought by employers. Vocational training must also be improved through additional resources and, equally important, through collaboration with the private sector to ensure that workers receive training useful to employers.

Demand side

The demand side of the labor market is even more important. Improving education and skills is only useful for boosting employment if labor-intensive sectors of the economy are growing and demanding the services of skilled workers. The lessons of the comparator countries are clear: export-led growth of labor-intensive manufactured goods such as clothing and shoes played a crucial role in boosting employment, particularly for women, in Bangladesh, China, Mauritius, and Viet Nam. Although wages are typically very low among competitive exporters, at least initially, the incomes and security of factory jobs are a


vast improvement over subsistence farming and street-hawking. Further, over time, export-oriented industries upgrade technologically and wages rise, as China illustrates most dramatically. Equally important, rising incomes and opportunities for women promote a demographic transition, lowering births and population growth, and eventually contributing to redressing the imbalance of supply and demand in the labor market.

The analysis suggests the importance of fostering export competitiveness by attracting foreign investment and technology, while keeping wages low until productivity rises. Are targeted government policies or general improvements in the business climate the key to international competitiveness and labor-intensive exports? This study has argued that both are important and mutually reinforcing.

Supportive policies and a reasonably well-functioning business climate have been crucial to the successful low-income exporters. Countries such as China, Mauritius, and Viet Nam lured foreign investment through a combination of low wages and good infrastructure. However, countries pursue different strategies, and a range of approaches are possible. Bangladesh, for example, with an early start, very low wages, and a strong business association has developed a booming garment export industry employing millions of women, while ranking poorly on many measures of the investment climate, including corruption and infrastructure quality. This was made possible by a powerful business association that organized the garment sector and insulated it from government corruption and mismanagement.

Improvements in economy-wide infrastructure and institutions, moreover, may take a long time. Short-cuts are possible in the form of export processing zones (EPZs) or regional growth poles, and business incubators have proved useful in some circumstances, especially in Asia.

EPZs have proven useful in a number of Asian and Latin American economies, most famously China,



in attracting foreign investment in manufacturing and building domestic capabilities. In Africa, however, EPZs have largely failed. The most successful has been in Mauritius, where it was the starting point for the structural transformation of a mono-crop economy (based on sugar) into a clothing exporter, creating employment for many people, particularly women (as in Bangladesh). The Mauritian case reveals the potential of EPZs for Africa. However, the experience of Senegal also reveals the pitfalls. The timing and design of the EPZs in Senegal and Mauritius were similar, yet in Senegal the EPZ utterly failed. In Senegal, progress was slow in employment growth, population growth, and poverty decline, while in Mauritius, employment rose, population growth dropped, and poverty plummeted. The fundamental differences appear to be the overall investment climate and the government's commitment to make the EPZ work. As Madani put it, Mauritius was in effect "one big EPZ."¹⁶¹ This result underlines the importance of combining targeted measures such as EPZs with overall sound policies such as investing in education and infrastructure and maintaining competitive exchange rates. More recently, Ethiopia, working closely with Chinese investors, provided another positive example of targeted industrial development, although political instability and macroeconomic pressures suggest caution in evaluating the Ethiopian case.

EPZs mainly aim at larger firms. But the pervasive informal sector, comprising very small enterprises, is a common feature of African economies. Assisting small and medium-size enterprises boost productivity is another important way of improving employment opportunities. Business incubators, like EPZs, are designated areas for bringing together and assisting firms—in this case small

and medium-size firms that require technical assistance (finance, marketing, accounting, managerial, and so on). Incubators aim to provide firms with business services and to connect them with experienced mentors. Like other business assistance programs, incubators will succeed only if governments work closely with the private sector to learn the needs of their clients and display resourcefulness and flexibility in meeting those needs.

The general lesson for African countries is that expanding employment rapidly requires creating jobs through labor-intensive exports and domestic private sector development while taking individual countries' circumstances and comparative advantages into consideration. Manufacturing is not the only vehicle for exports of labor-intensive products—agricultural exports are an alternative in many countries. Traditional primary products such as groundnuts and cocoa, as well as horticulture (fruits, vegetables, and cut flowers), share many features of manufacturing: in the African context, they are labor-intensive, confront the demanding quality and reliability standards of developed-country markets, and are subject to technological upgrading. Other sectors, such as fishing and tourism, also offer potential for labor-intensive exports.

In the end, raising employment in the formal sector requires a commitment of public policy to improve the competitiveness of labor-intensive production, through interventions on both the supply and demand sides of the labor market—developing the practical skills of workers through more and better education, and improving the business environment for firms that hire workers.

ANNEX

THE LEWIS AND HARRIS–TODARO MODELS OF EMPLOYMENT IN THE FORMAL AND INFORMAL SECTORS

Lewis model

Lewis viewed economic development as the expansion of the modern sector, raising formal employment as labor is absorbed from the subsistence sector. Lewis mostly identified the subsistence sector with smallholder farming, but he also explicitly recognized its affinity to what is now known as the urban informal sector:

What we have is not one island of expanding capitalist employment surrounded by a vast sea of subsistence workers, but rather a number of such tiny islands.... We find a few industries highly capitalized such as mining or electric power side by side with most primitive techniques, a few high class shops surrounded by masses of old style traders, a few highly capitalized plantations, surrounded by a sea of peasants.¹⁶²

More formally, the Lewis model focuses on the allocation of labor between the between rural/informal sector (r) and modern/formal (m) sector. MPL is the marginal productivity of labor, and W the real wage. Due to a “surplus” of labor, MPL is very low, with the modern sector consequently facing a perfectly elastic supply of labor at a very low subsistence wage level. For reasons not specified by Lewis, however, W_m is set exogenously well above the subsistence level W_r . This could be due to union power, minimum wages, and/or efficiency wage-setting. Modern sector expansion due to capital investment

and/or technological progress raises MPL_m , boosting employment in the formal sector and absorbing labor from the traditional sector. Eventually, the absorption of labor in the modern sector reaches the “Lewis turning point,” and incomes begin to rise above subsistence levels in the traditional sector.

The modern sector’s output may be modeled using a Cobb–Douglas function (subscript m suppressed),

$$Q = F(A, K, L) = AK^{\alpha}L^{1-\alpha}$$

where A is technology, K is capital, and L is labor. Labor market equilibrium implies $MPL = W$.

Denoting $\dot{L} = \frac{dL/dt}{L}$ and likewise for other variables, it is easy to show that:

$$\dot{L} = \frac{\dot{A} + \alpha\dot{K} - \dot{W}}{\alpha}$$

That is, the rate of growth of modern-sector employment depends on technological progress, capital accumulation, and real wage moderation in the formal sector.

Harris–Todaro Model

The Harris–Todaro (1970) equilibrium may be stated as:

$$W_m \frac{L_m}{L - L_r} = W_r$$

where $L - L_r$ is the urban labor force and $\frac{L_m}{L - L_r}$ is the probability of finding a job in the modern sector. This model explains why rural–urban migration continues despite high urban unemployment.

NOTES

The authors thank Célestin Monga for inviting them to write this study. Kazuatsu Shimizu of Swarthmore College contributed very helpful research assistance.

1. Golub and Hayat 2015.
2. Benjamin and Mbaye 2012; Mbaye et al. 2018.
3. Gollin and Ranis 2014.
4. Fox and Pimhidzai 2013; Fields 2012.
5. Informal employment in table 1 is slightly higher than wage employment in Fox and Pimhidzai (2013) because informal employment includes some part-time and informal wage employment.
6. Benjamin and Mbaye 2012; Benjamin and Mbaye 2014; and Golub and Mbaye (forthcoming).
7. The ILO measure of vulnerable employment for Ethiopia seems to have a break in definition of vulnerable employment, as the data show an implausible drop from about 80 percent to 50 percent in 2015.
8. Table 4 does not include unemployment as unemployment rates are not available by gender.
9. Benjamin and Mbaye 2012; Mbaye et al. 2015.
10. African Development Bank 2012.
11. African Development Bank 2012; Gollin and Ranis 2014; Page 2012.
12. Golub and Mbaye 2002.
13. Golub and Hansen-Lewis 2012.
14. Lewis 1954. This section draws on Golub and Hayat (2015) and Golub, Bernhardt and Liu (2011).
15. Harris and Todaro 1970.
16. Fields 1975; 1990.
17. Fields 1975.
18. Gaal and Fox 2008.
19. Golub, O'Connell, and Du 2007.
20. Golub et al. 2018.
21. Rodrik 2016; Stiglitz et al. 2013.
22. Fox and Sohnesen 2012.
23. Fox and Thomas 2016; Golub, O'Connell, and Du 2007; Jourdan 2013. Lewis himself recognized that the distinction between traditional and modern activities did not coincide with rural and urban (see the annex).
24. Brenton, Newfarmer, and Walkenhorst 2009; Golub, O'Connell, and Du 2007.
25. Lin 2011.
26. Rodrik 2014.
27. Lin and Monga 2010.
28. Golub, Jones, and Kierzkowski 2007.
29. Monga 2014.
30. Golub, Jones, and Kierzkowski 2007.
31. Dollar and Kraay 2003.
32. Rodrik 2014.
33. World Bank 2018d.
34. Yunus and Yamagata 2012.
35. Golub, Mbaye, and Chwe 2015.
36. Golub et al. 2018.
37. Golub et al. 2018.
38. Lin and Monga 2010; Rodrik 2014.
39. International Labour Organization 2014.
40. Maurer and Degain 2010.
41. Farole 2010.
42. Auty 2011.
43. Zeng 2010.
44. Brautigam and Xiaoyang 2011.
45. Bheenick and Schapiro 1991.
46. UNIDO 2016.
47. Baissac 2011.
48. Mulu 2013.
49. Ackah, Adjasi, and Turkson 2016.
50. Farole 2010.
51. Madani 1999.
52. Madani 1999.
53. Curran et al. 2009.
54. Keesing 1992.
55. Farole 2010.
56. Zeng 2010.
57. Zeng 2015.
58. Curran et al. 2009.
59. Zeng 2010.
60. Newman and Page 2017.
61. International Labour Organization 2014.
62. Glick and Roubaud 2006.
63. Cirera and Laksham 2017.
64. Madani 1999.
65. Sawkut, Vinesh, and Sooraj 2009.
66. Zeng 2015.
67. Newman and Page 2017.
68. Hoffman and Radojevich-Kelley 2012.
69. Canadian Association of Business Incubation. <http://www.canadabusiness.ca/eng/blog/entry/3607/>.
70. Pauwels, Clarysse, Wright, and Van Hove 2016.
71. Zajicek 2017.
72. Sepulveda 2012.

73. Bayen and Giuliani 2018.
74. Cohen 2013.
75. Kelly and Firestone 2016; World Bank 2016b.
76. Fal 2013.
77. Adegoke 2018.
78. Golub, Mbaye, and Chwe 2015.
79. Millennium Challenge Corporation 2017.
80. ANSD 2016.
81. ANSD 2016.
82. Golub, Mbaye, and Chwe 2015.
83. Ministère de la Jeunesse 2014.
84. Office of the United Nations High Commissioner for Human Rights 2015.
85. Africa for Women's Rights n.d.
86. Benjamin and Mbaye 2012; Golub and Hayat 2015. In some large informal sector firms, wages are closer but still below those of the formal sector (Benjamin and Mbaye 2012).
87. Mbaye 2005; World Bank 2017a.
88. Poulton et al. 2004.
89. Golub and Mbaye 2002.
90. English 2016.
91. English 2016; IMF 2017.
92. English 2016.
93. Seid, Taffesse, and Ali 2015.
94. Broussard et al. 2014; Golub and Hayat 2015.
95. Martins 2014.
96. Alternatively, the World Bank Jobs database estimates the decline in the share of agriculture in employment from 1996 to 2011 to be from 88.6 to 75.5 percent.
97. World Bank 2015a.
98. World Bank 2016a.
99. World Bank 2016a.
100. Ministry of Education 2015.
101. Specifically, there were 46,304 reported total vacancies, 13 percent of which were for skilled workers (Ministry of Education 1999–2015, Ministry of Labour and Social Affairs 2009–10).
102. Seid, Taffesse, and Ali 2015.
103. Seid, Taffesse, and Ali 2015.
104. Serneels 2007.
105. World Bank 2015a.
106. Chandra et al. 2012.
107. The reason for firms' low demand of TVET workers is has not been investigated.
108. World Bank 2015a.
109. Altenburg 2010; Gebreeyesus 2016.
110. Sun 2017.
111. Donahue 2018.
112. Altenburg 2010.
113. Altenburg 2010.
114. Golub, Mbaye, and Chwe 2015.
115. IMF 2018b.
116. World Bank 2016a.
117. Charmes 2018.
118. République du Bénin 2014. Alternatively, the World Bank Jobs database estimated that 41.32 percent of employment was in agriculture in 2016. See table on sectoral breakdown of employment.
119. PASCIB 2013.
120. Mbaye et al. 2018.
121. IMF 2018.
122. World Bank 2009.
123. World Bank 2009.
124. World Bank 2015b.
125. Golub 2012.
126. Golub 2012.
127. IMF 2018.
128. IMF 2018b; Papageorgiou, Perez-Sebastian, and Spatafora 2013.
129. World Bank 2015.
130. World Bank 2015.
131. Vitale 2018.
132. World Bank 2017b.
133. Odusola et al. 2017.
134. Vitale 2018.
135. Kaminski 2011.
136. World Bank 2017c.
137. World Bank 2018b.
138. Enhanced Integrated Framework 2014.
139. World Bank 2018b.
140. World Bank 2017a; World Bank 2017c.
141. Bureau of International Labor Affairs 2016.
142. World Bank 2018b.
143. Aryeetey and Baah-Boateng 2015.
144. Honorati and de Silva 2016.
145. Alternatively, the World Bank Jobs database estimates that from 1991 to 2012, the share of agriculture in employment fell from 56 to 43 percent, while the share of services in employment rose from 30 to 42 percent. See the table on sectoral breakdown of employment for Ghana.
146. Aryeetey and Baah-Boateng 2015.

147. Aryeetey and Baah-Boateng 2015.
148. World Bank 2018a.
149. The services sector's share of GDP grew from 51.1 percent in 2010 to 56.9 percent in 2016, and the industrial sector's share of GDP has been 26 percent since 2010.
150. Honorati and de Silva 2016.
151. Honorati and de Silva 2016.
152. Aryeetey and Baah-Boateng 2015.
153. Cloutier, Reinstadtler, and Beltran 2011; Honorati and de Silva 2016.
154. Aryeetey and Baah-Boateng 2015.
155. Using the International Labour Organization's quantitative measures of overeducation and undereducation. Honorati and de Silva 2016.
156. World Bank 2018a.
157. Golub and McManus 2008.
158. Oppong 2013.
159. Honorati and de Silva 2016.
160. Aryeetey and Baah-Boateng 2015.
161. Madani 1999.
162. Lewis 1954, 147.

REFERENCES

- Ackah, C., C. Adjasi, and F. Turkson. 2016. "Industrial Policy In Ghana." In C. Newman, J. Page, J. Rand, A. Shimeles, M. Soderbom, and F. Tarp (Eds.), *Manufacturing Transformation: Comparative Studies of Industrial Development in Africa and Emerging Asia* (pp. 50–71). Oxford: Oxford University Press.
- Adegoke, Y. 2018. "The problem with simply growing more tech hubs in Africa." *Quartz Africa*. <https://qz.com/1305289/africa-needs-more-tech-hubs-to-drive-innovation-and-entrepreneurship/>.
- Africa for Women's Rights. n.d. "Senegal." http://www.africa4womensrights.org/public/Dossier_of_Claims/SenegalENG.pdf.
- African Development Bank. 2012. *African Economic Outlook 2012: Promoting Youth Employment*. Tunis: African Development Bank.
- Aglionby, J., and E. Feng. 2018. "China Scales Back Investment in Ethiopia." *Financial Times*. <https://www.ft.com/content/06b69c2e-63e9-11e8-90c2-9563a0613e56>.
- Ahmed, F., A. Greenleaf, and A. Sacks. 2014. "The Paradox of Export Growth in Areas of Weak Governance: The Case of the Ready Made Garment Sector in Bangladesh." *World Development* 56: 258–271.
- Altenburg, T. 2010. "Industrial Policy in Ethiopia." German Development Institute, Bonn, Germany.
- ANSD. 2016. "Enquête Nationale sur L'Emploi au Senegal 2015."
- Ansu, Y., M. McMillan, J. Page, and D. W. te Velde. 2016. *African Transformation Forum 2016 Promoting Manufacturing In Africa*. African Center for Economic Transformation.
- Arthur, C. 2017. *A tiny Irish town and China's rise to superpower status*. Retrieved from UNIDO.org: <https://www.unido.org/stories/tiny-irish-town-and-chinas-rise-superpower-status>.
- Aryeetey, E., and W. Baah-Boateng. 2015. *Understanding Ghana's growth success story and job creation challenges*. WIDER Working Paper No. 2015/140, UNU-WIDER, Helsinki.
- Asian Development Bank. 2016. *Bangladesh: Consolidating Export-led Growth: Country Diagnostic Study*. Mandaluyong City, Philippines: Asian Development Bank. Retrieved from <https://www.adb.org/publications/bangladesh-consolidating-export-led-growth>.
- Auty, R. 2011. "Early Reform Zones: Catalysts for Dynamic Market Economies in Africa." In T. Farole, and G. Akinci (Eds.), *Special Economic Zones* (pp. 207–226). Washington, DC: World Bank.
- Baissac, C. 2011. "Planned Obsolescence? Export Processing Zones and Structural Reform in Mauritius." In T. Farole and G. Akinci (Eds.), *Special Economic Zones* (pp. 227–244). Washington, DC: World Bank.
- Basu, K. 2018. "Why Is Bangladesh Booming." *Project Syndicate*. <https://www.project-syndicate.org/commentary/bangladesh-sources-of-economic-growth-by-kaushik-basu-2018-04>.
- Bayen, M., and D. Giuliani. 2018. *1000 Tech Hubs are Powering Ecosystems in Asia Pacific and Africa*. Retrieved from GSMA: <https://www.gsma.com/mobilefordevelopment/programme/ecosystem>

- accelerator/1000-tech-hubs-are-powering-ecosystems-in-asia-pacific-and-africa/.
- Benjamin, N. and Mbaye, A. A. (2012). *The Informal Sector in Francophone Africa: Firm Size, Productivity and Institutions*. Washington DC: World Bank.
- . 2014. “Informality Growth and Development in Africa.” In C. Monga and J.Y. Lin (eds.), *Oxford Handbook on Africa and Economics*. New York: Oxford University Press.
- Bheenick, R., and M. Schapiro. 1991. “The Mauritian Export Processing Zone.” *Public Administration and Development* 11: 263–267.
- Brautigam, D., and T. Xiaoyang. 2011. “African Shenzhen: China’s Special Economic Zones in Africa.” *Journal of Modern African Studies* 49 (1): 27–54. doi:10.1017/S0022278X10000649.
- Brenton, P., R. Newfarmer, and P. Walkenhorst. 2009. “Avenues for Export Diversification: Issues for Low-Income Countries.” Working Paper No. 47, Commission on Growth and Development, Washington, DC.
- Broussard, N. H., J. Page, T. Gebrekidan, T. Ferede, and H. T. Reda. 2014. “Ethiopia.” In Hiroyuki Hino and Gustav Ranis (Eds.), *Youth and Employment in Sub-Saharan Africa: Working but Poor*. New York: Routledge.
- Bureau of International Labor Affairs. 2016. “Findings on the Worst Forms of Child Labor.” Washington, DC: United States Department of Labor.
- Burke, J. 2013. “Majority of Bangladesh Garment Factories ‘Vulnerable to Collapse.’” Dhaka, Bangladesh: Guardian News and Media Limited.
- Canadian Association of Business Incubation. 2010. “Hatching your start-up through business incubation.” Blog post. Canada Business Network. <https://canada.business.ca/blog/hatching-your-start-up-through-business-incubation-1/?it=eng/blog/entry/3607/>.
- Chandra, V., F. Cossar, H. T. Dinh, and V. Palmade. 2012. *Light Manufacturing in Africa: Targeted Policies to Enhance Private Investment and Jobs*. Washington DC: World Bank.
- Charmes, J. 2018. *Informality, Solidarities, Unpaid care work. Forms of Resilience in Developing Countries*. Springer.
- Cirera, X., and R. W. Laksham. 2017. “The Impact of Export Processing Zones on Employment, Wages, and Labour Conditions in Developing Countries: Systematic Review.” *Journal of Development Effectiveness* 9 (3): 344–360. doi:10.1080/19439342.2017.1309448.
- Cisse, F., J. E. Choi, and M. Maurel. 2017. “Industrial Policy in Senegal.” In C. Newman, J. Page, J. Rand, A. Shimeles, M. Soderbom, and F. Tarp (Eds.), *Manufacturing Transformation: Comparative Studies of Industrial Development in Africa and Emerging Asia* (pp. 136–154). Oxford: Oxford University Press.
- Cloutier, M. H., C. Reinstadtler, and I. Beltran. 2011. “Making the Grade: Assessing Literacy and Numeracy in African Countries.” DIME Brief, World Bank, Washington, DC.
- Cohen, S. 2013. “What Do Accelerators Do? Insights from Incubators and Angels.” *Innovations: Technology, Governance, Globalization* 8 (3–4): 19–25. https://doi.org/10.1162/INOV_a_00184.
- Curran, S., J. Cook, K. Hampton, C. Clark, G. Yorgey, and L. C. Anderson. 2009. *The Impacts of Special Economic Zones*. Evans School of Public Affairs, Evans School Policy Analysis and Research (EPAR). Seattle, WA: University of Washington.
- Dollar, D., and A. Kraay. 2003. “Institutions, Trade, and Growth.” *Journal of Monetary Economics* 50 (1): 133–162.
- Donahue, B. 2018. “China is Turning Ethiopia into a Giant Fast-Fashion Factory.” *Bloomberg*. <https://www.bloomberg.com/news/features/2018-03-02/china-is-turning-ethiopia-into-a-giant-fast-fashion-factory>.
- English, P. 2016. “Senegal: A Service Economy in Need of an Export Boost.” Draft, UNU-WIDER, Helsinki.
- Enhanced Integrated Framework. 2014. *Burkina Faso Etude Diagnostique sur l’Intégration Commerciale* (Diagnostic Trade Integration Study). Geneva.
- Fal, M. 2013. “Accelerating Entrepreneurship in Africa.” *Innovations: Technology, Governance, Globalization* 8 (3–4): 149–168. https://doi.org/10.1162/INOV_a_00193.
- Farole, T. 2010. *Second Best? Investment Climate and Performance in Africa’s Special Economic Zones*. Washington, DC: World Bank.

- . 2011. *Special Economic Zones in Africa*. Washington, DC: World Bank.
- Fields, G. S. 1975. "Rural-urban migration, urban unemployment and under-development, and job-search security in LDCs." *Journal of Development Economics* 2 (2): 165–187.
- . 1990. "Labor Market Modelling and the Urban Informal Sector: Theory and Evidence." In D. Turnham, B. Salomé, and A. Schwartz (Eds.), *The Informal Sector Revisited*. Paris: Organisation for Economic Cooperation and Development.
- . 2012. *Working Hard, Working Poor*. New York: Oxford.
- Gaal, M. S., and L. Fox. 2008. *Working Out of Poverty: Job Creation and the Quality of Growth in Africa*. Washington DC: World Bank.
- Fox, L., and O. Pimhidzai. 2013. "Different Dreams, Same Bed: Collecting, Using, and Interpreting Employment Statistics in Sub-Saharan Africa—the Case of Uganda." Policy Research Working Paper No. 6184, World Bank, Washington, DC.
- Fox, L., and T. P. Sohnesen. 2012. "Household Enterprises in Sub-Saharan Africa: Why They Matter for Growth, Jobs, and Livelihoods." Policy Research Working Paper No. 6184, World Bank, Washington, DC.
- Fox, L., and A. Thomas. 2016. "Africa's Got Work to Do: A Diagnostic of Youth Employment Challenges in Sub-Saharan Africa." *Journal of African Economies* 25: i16–i36.
- Francoise, N. 2017. *Chinese Investors in Ethiopia: The Perfect Match?* Paris: Institut Français des Relations Internationales.
- Frankel, J. 2012. *Mauritius: African Success Story*. Cambridge, MA: Harvard University Center for International Development.
- Gebreeyesus, M. 2016. "Industrial Policy and Development in Ethiopia: Evolution and Present Experimentation." Learning to Compete Working Paper No. 6, Brookings Institution, Washington, DC.
- Glick, P., and F. Roubaud. 2006. "Export Processing Zone Expansion in Madagascar: What are the Labor Market and Gender Impacts?" *Journal of African Economies* 15 (4): 722–756. doi:10.1093/jae/ejk016.
- Gollin, D., and G. Ranis. 2014. *Youth and Employment in Sub-Saharan Africa*. London: Routledge.
- Golub, S. S. 2012. "Entrepot Trade and Smuggling in West Africa: Benin, Togo and Nigeria." *The World Economy* 35 (9): 1139–1161.
- Golub, S. S., and A. A. Mbaye. 2002. "Obstacles and Opportunities for Senegal's International Competitiveness: Case Studies of the Peanut Oil, Fishing and Textile Industries." Africa Region Working Paper Series No. 37, World Bank, Washington, DC.
- Golub, S. S., R. W. Jones, and H. Kierzkowski. 2007. "Globalization and Country-Specific Service Links." *Journal of Economic Policy Reform* 10 (2): 63–88.
- Golub, S. S., S. O'Connell, and W. Du. 2007. "Export Competitiveness and Development in Least-Developed Countries." Swarthmore, PA: Swarthmore College.
- Golub, S. S., and J. McManus. 2008. "Horticulture Exports and African Development." Paper prepared for UNCTAD, Geneva.
- Golub, S. S., A. Bernhardt, and M. Liu. 2011. "Development and Trade Strategies for Least Developed Countries." Paper prepared for UNCTAD, Geneva.
- Golub, S. S., and J. Hansen-Lewis. 2012. "Informal Trading Networks in West Africa." In N. Benjamin and A. A. Mbaye (Eds.), *The Informal Sector in Francophone Africa*. Washington, DC: World Bank.
- Golub, S. S., and F. Hayat. 2015. "Employment, Unemployment and Underemployment in Africa." In J. Y. Lin and C. Monga (Eds.), *Handbook of Africa and Economics*. New York: Oxford University Press.
- Golub, S. S., A. A. Mbaye, and H. Chwe. 2015. "Labor Market Regulations in Sub-Saharan Africa, with a Focus on Senegal." Development Policy Research Unit Working Paper 201505, DPRU, University of Cape Town.
- Golub, S.S., J. Ceglowski, A. A. Mbaye, and V. Prasad. 2018. "Can Africa Compete with China in Manufacturing?" *The World Economy*.
- Golub, S. S., and A. A. Mbaye (Eds). Forthcoming. *The Informal Sector in Central and West Africa*. Cape Town: University of Cape Town Press.

- Harris, J. R., and M. P. Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review* 60 (1): 126–142.
- Hoffman, D. L., and N. Radojevich-Kelley. 2012. "Analysis of Accelerator Companies: An Exploratory Case Study of Their Programs, Processes, and Early Results." *Small Business Institute Journal* 8 (2): 54–70.
- Honorati, M., and S. J. de Silva. 2016. *Expanding Job Opportunities in Ghana*. Washington, DC: World Bank.
- IMF (International Monetary Fund). 2017. "Senegal: Selected Issues." Country Report, IMF, Washington, DC.
- . 2018a. "Benin: Selected Issues." Country Report, IMF, Washington, DC.
- . 2018b. "The Federal Democratic Republic of Ethiopia: 2017 Article IV Consultation." Country Report 18/18, IMF, Washington, DC.
- ILO (International Labour Organization). 2014a. *Trade Union Manual on Export Processing Zones*. Bureau for Workers' Activities. Geneva.
- . 2014b. *Wages and Working Hours in the Textiles, Clothing, Leather and Footwear Industries*. Geneva: ILO Publications.
- . 2017. *Upgrading Skills in Bangladesh: Lower Staff Turnover, Higher Benefits for Employers and Employees Alike*. Geneva. http://www.ilo.org/global/about-the-ilo/newsroom/features/WCMS_577464/lang--en/index.htm.
- . 2018. *Export Processing Zones*. Geneva. http://www.ilo.org/actrav/areas/WCMS_DOC_ATR_ARE_EPZ_EN/lang--en/index.htm.
- . n.d. ILOSTAT [database]. Geneva.
- International Trade Center. n.d. *Bangladesh Trade Indicators*. Retrieved from International Trade Center Trade Map: <https://www.trademap.org/Index.aspx>.
- IPRCC (International Poverty Reduction Center in China) and UNDP (United Nations Development Programme). 2015. *If Africa Builds Nests, Will the Birds Come?* New York and Beijing.
- Jourdan, P. 2013. "Toward a Resource-Based African Industrialization Strategy." In J. Stiglitz, J. Lin, and J. Esteban (Eds.), *The Industrial Policy Revolution II* (pp. 364–385). London: Palgrave Macmillan.
- Kaminski, J. 2011. "Cotton dependence in Burkina Faso: Constraints and opportunities for balanced growth." In P. Chuhan-Pole and M. Angwafo (Eds.), *Yes Africa Can: Success stories from a dynamic continent* (pp. 107–124). Washington, DC: World Bank.
- Keesing, D. 1992. *Trends in Export Processing Zones*. Washington, DC: World Bank.
- Kelly, T., and R. Firestone. 2016. *Digital Dividends: How Tech Hubs are Helping to Drive Economic Growth in Africa*. Washington, DC: World Bank. Retrieved from <https://openknowledge.worldbank.org/handle/10986/23645>.
- Kennard, M., and C. Provost. 2016. "Shannon: A Tiny Irish Town Inspires China's Economic Boom." *The Guardian*. <https://www.theguardian.com/cities/2016/apr/19/story-of-cities-25-shannon-ireland-china-economic-boom>.
- Khatiwada, S. 2014. "A Quiet Revolution: Women in Bangladesh." International Labour Organization. http://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_234670/lang--en/index.htm.
- Lahirini, T. 2018. "One chart shows the pressure from the global supply chain that imperils garment workers." *Quartz*. <https://qz.com/1261588/five-years-after-rana-plaza-the-supply-chain-dynamics-that-imperil-garment-workers-are-still-doing-their-thing/>.
- Lewis, W. A. 1954. "Economic Development with Unlimited Supplies of Labor." *The Manchester School* 22 (2): 139–191.
- Lin, J. Y. 2011. *From Flying Geese to Leading Dragons*. Mauputo: World Bank.
- Lin, J. Y., and C. Monga. 2010. "Growth Identification and Facilitation: The Role of the State in the Dynamics of Structural Change." Policy Research Working Paper No. 5313, World Bank, Washington, DC.
- Lu, S. 2017. *2017 Fashion Industry Benchmarking Study*. Washington, DC: United States Fashion Industry Association.
- Madani, D. 1999. *A Review of the Role and Impact of Export Processing Zones*. Washington, DC: World Bank.

- Martins, P. 2014. "Structural change in Ethiopia: an employment perspective." Policy Research Working Paper 6749, World Bank, Washington, DC.
- Maurer, A., and C. Degain. 2010. *Globalization and Trade Flows: What You See is Not What You Get!* Geneva: Economic Research and Statistics Division, World Trade Organization.
- Mbaye, A. A. 2005. "Sanitary and Phytosanitary Requirements and Developing Country Agro Food exports: An Assessment of the Senegalese Groundnut Sector." Agriculture and Rural Development Discussion Paper, World Bank, Washington, DC.
- Mbaye, et al. 2015. Secteur informel, environnement des affaires et croissance économique: une analyse comparative de l'Afrique de l'Ouest et du centre.
- Mbaye, A. A., A. Bèye, A. Guèye, B. Lokonon, and Y. Ndione. 2018. "Generating employment and increasing income in agricultural value chains and thereby fostering food security: Case studies of rice and cotton in Benin and Senegal." Discussion Paper 270850, University of Bonn, Center for Development Research, Bonn, Germany.
- Millennium Challenge Corporation. 2017. "Senegal Constraints Analysis Report." <https://www.mcc.gov/resources/doc/report-senegal-ii-constraints-analysis>.
- Ministère de la Jeunesse, de l'Emploi et de la Promotion des Valeurs Civiques. 2014. "L'Emploi des Jeunes au Sénégal: une Priorité Nationale." Dakar.
- Ministry of Education. 1999–2015. Education Statistics Annual Abstracts. Addis Ababa: Ministry of Education, Federal Republic of Ethiopia.
- Ministry of Labor and Social Affairs. 2009–10. "Labor Market Information Bulletin 2009/10." Addis Ababa: Ministry of Labor and Social Affairs, Federal Republic of Ethiopia.
- Monga, C. 2014. "The False Economics of Preconditions: Policymaking in the African Context." *Journal of African Development* 16 (2): 121–140.
- Mosley, P. 2018. "Why Has Export Diversification Been So Hard to Achieve in Africa?" *The World Economy* 41 (4): 1025–1044.
- Mottaleb, K., and T. Sonobe. 2011. "An Inquiry into the Rapid Growth of the Garment Industry in Bangladesh." *Economic Development and Cultural Change* 60 (1): 67–89.
- Mulu, G. 2013. *Industrial Policy and Development in Ethiopia: Evolution and Present Experimentation*. Helsinki: UNU-WIDER.
- Neveling, P. 2015. "Export Processing Zones and Global Class Formation." In J. Carrier and D. Kalb (Eds.), *Anthropologies of Class: Power, Practice, and Inequality* (p. 164). Cambridge University Press.
- Newman, C., and J. M. Page. 2017. *Industrial Clusters: The case for Special Economic Zones in Africa*. Helsinki: UNU-WIDER.
- Odusola, A., R. Lal, R. Dhliwayo, I. Sabo, and J. Neuhaus. 2017. "Drivers of Income Inequality in Burkina Faso, Ghana and the United Republic of Tanzania: A comparative analysis." In *Income Inequality Trends in sub-Saharan Africa: Divergence, determinants and consequences* (pp. 316–341). New York: United Nations Development Program.
- Office of the United Nations High Commissioner for Human Rights. 2015. "Women in Senegal: Breaking the Chains of Silence and Inequality." Press Release. Dakar and Geneva. <http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=15857&LangID=E>.
- Oppong, N. A. 2013. "Call Centre Outsourcing: Comparative Assessment of Ghana's Readiness as a Provider." *European Journal of Business and Management* 20 (5).
- Page, J. 2012. "Youth, Jobs, and Structural Change: Confronting Africa's "Employment Problem." Working Paper No. 155, African Development Bank, Abidjan, Côte d'Ivoire.
- Papageorgiou, C., F. Perez-Sebastian, and N. Spatafora. 2013. "Structural Change through Diversification: A Conceptual Framework." Washington, DC: International Monetary Fund.
- PASCIB. 2013. "La Filière Coton au Bénin: Regard et Analyses Prospectives de la Société Civile." Cotonou Bulletin No. 4, Cotonou, Benin: Friedrich Ebert Stiftung.
- Pauwels, C., B. Clarysse, M. Wright, and J. Van Hove. 2016. "Understanding a new generation incubation model: The accelerator." *Technovation* 50: 13–24.
- Poulton, C., P. Gibbon, B. Hanyani-Mlambo, J. Kydd, M. Larsen, W. Maro, A. Osorio, D. Tschirley, and B. Zulu.

2004. "Competition and Coordination in Liberalized African Cotton Market Systems." *World Development* 32 (3): 519–536.
- République du Bénin. 2014. "Analyse Globale de la Vulnérabilité et de la Sécurité Alimentaire." Cotonou: INSAE.
- Rhee, Y. 1990. "The Catalyst Model of Development: Lessons from Bangladesh's Success with Garment Exports." *World Development* 18 (2): 333–346.
- Rodrik, D. 2014. "The Past, Present, and Future of Economic Growth. Challenge." 57 (3): 5–39. doi: 10.2753/0577-5132570301.
- . 2016. "An African Growth Miracle?" *Journal of African Economies* 1–18. doi:10.1093/jae/ejw027.
- Roubaud, F., and C. Torelli. 2013. "Employment, Unemployment and Working Conditions in Urban Labor Markets of Sub-Saharan Africa: Main Stylized Facts." In P. de Vreyer and F. Roubaud (Eds.), *Urban Labor Markets in Sub-Saharan Africa* (pp. 37–80). Washington, DC: World Bank.
- Sawkut, R., S. Vinesh, and F. Sooraj. 2009. "The Net Contribution of the Mauritian Export Processing Zone Using Cost-Benefit Analysis." *Journal of International Development*, 21 (3): 379–392. doi:10.1002/jid.1489.
- Seid, Y., A. S. Taffesse, and S. N. Ali. 2015. "Ethiopia: An agrarian economy in transition." Working Paper No. 2015/154, UNU-WIDER, Helsinki.
- Sepulveda, F. 2012. *The Difference Between a Business Accelerator and a Business Incubator?* Retrieved from Inc.com: <https://www.inc.com/fernando-sepulveda/the-difference-between-a-business-accelerator-and-a-business-incubator.html>.
- Serneels, P. 2007. "The Nature of Unemployment among Young Men in Urban Ethiopia." *Review of Development Economics* 11 (1): 170–86.
- Staritz, C., and W. Lindsay. 2017. *Made in Ethiopia: The Emergence and Evolution of the Ethiopian Apparel Export Sector*. Roskilde, Denmark: Roskilde University.
- Stiglitz, J., J. Lin, C. Monga, and E. Patel. 2013. "Industrial Policy in the African Context." The World Bank, Office of the Chief Economist, Development Economics. World Bank.
- Sun, I. Y. 2017. "The World's Next Great Manufacturing Center." *Harvard Business Review* (May–June). <https://hbr.org/2017/05/the-worlds-next-great-manufacturing-center>.
- UNDP (United Nations Development Programme). 2015. *Millennium Development Goals Bangladesh Progress Report*. General Economics Division, Planning Commission. <http://www.bd.undp.org/content/bangladesh/en/home/library/mdg/mdg-progress-report-2015.html>.
- UNIDO (United Nations Industrial Development Organization). 2016. *Industrial Free Zones Boost Mauritius' Export-Led Manufacturing*. Vienna. https://50.unido.org/impact/index.html?_ga=2.196832684.1820042042.1528824894-1343307561.1528824894#home/1969-mauritius.
- Vitale, J. 2018. *Economic importance of cotton in Burkina Faso*. Rome: Food and Agriculture Organization of the United Nations.
- World Bank. 2009. "Benin Country Economic Memorandum." Report No. 48233, World Bank, Washington, DC.
- . 2013. *World Development Report 2013: Jobs*. Washington DC: World Bank.
- . 2015a. "4th Ethiopia Update: Overcoming Obstacles to the Manufacturing Sector." Working Paper 97916, World Bank, Washington, DC.
- . 2015b. "Benin Diagnostic Trade Integration Study Update." Report No. 97242-BJ, World Bank, Washington, DC.
- . 2016a. "5th Ethiopia Economic Update: Why so idle? Wages and employment in a crowded labor market." Working Paper 110730, World Bank, Washington, DC.
- . 2016b. *Tech Hubs In Africa*. Washington, DC. <http://wbfiles.worldbank.org/documents/dec/Tech-Hubs-in-Africa.html>.
- . 2017a. "Senegal Groundnut Value Chain Competitiveness and Prospects for Development." Working Paper 117011, World Bank, Washington, DC.
- . 2017b. "Burkina Faso: Agriculture as a Powerful Instrument for Poverty Reduction." Project Brief, World

- Bank, Washington, DC. <http://www.worldbank.org/en/results/2017/06/29/burkina-faso-agriculture-as-a-powerful-instrument-for-poverty-reduction>.
- . 2018a. “3rd Ghana Economic Update: Agriculture as an Engine of Growth and Jobs Creation.” Working Paper 123707, World Bank, Washington, DC.
- . 2018b. “Burkina Faso: Bagré Growth Pole Project.” Washington, DC. <http://projects.worldbank.org/P119662burkina-faso-bagre-growth-pole-project?lang=en>.
- . 2018c. “Burkina Faso: Youth Employment and Skills Development.” Washington, DC. <http://projects.worldbank.org/P130735/bf-youth-employment-skills-development?lang=en>.
- . 2018d. *Doing Business 2018: Reforming to Create Jobs*. Washington, DC: World Bank.
- World Economic Forum. 2017a. *Global Gender Gap Report*. Cologny, Switzerland: World Economic Forum. <https://www.weforum.org/reports/the-global-gender-gap-report-2017>.
- . 2017b. *The Global Competitiveness Report 2017–2018*. Cologny, Switzerland: World Economic Forum. <https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018>.
- Yardley, J. 2013. “Garment Trade Wields Power in Bangladesh.” *The New York Times*. Dhaka, Bangladesh: New York Times. <https://www.nytimes.com/2013/07/25/world/asia/garment-trade-wields-power-in-bangladesh.html>.
- Yunus, M., and T. Yamagata. 2012. *The garment industry in Bangladesh*. Chiba, Japan: IDE-JETRO.
- Zajicek, H. 2017. “Accelerator vs. Incubator: Which Is Right for You?” *Entrepreneur*. <https://www.entrepreneur.com/article/294798>.
- Zeng, D. Z. 2010. *Building Engines for Growth and Competitiveness in China*. Washington, DC: World Bank.
- . 2010. “How Do Special Economic Zones and Industrial Clusters Drive China’s Rapid Development?” In D. Z. Zheng (Ed.), *Building Engines for Growth and Competitiveness in China* (pp. 1–53). Washington, DC: World Bank.
- . 2015. *Global Experiences with Special Economic Zones*. Washington, DC: World Bank.

SELECTED PROGRAMS AND TOOLS FOR YOUTH EMPLOYMENT FROM THE AFRICAN DEVELOPMENT BANK

Jobs for youth in Africa

Youth are Africa's greatest asset. Africa's youth population is growing rapidly and expected to double to more than 830 million by 2050. If properly harnessed, this increase in the working-age population could support higher productivity and stronger, more inclusive economic growth across the continent. But two-thirds of nonstudent youth are unemployed, discouraged, or only vulnerably employed—despite gains in education access over the past several decades.

Jobs for Youth in Africa is a Bank-wide strategy (2016–25) to create 25 million jobs and equip 50 million youth with the right skills to succeed in the digital economy. The Bank and its regional member countries intend to become engines of job creation for young Africans. First, youth employment considerations are incorporated into Bank projects, staff, and systems. This includes the provision of financial and technical assistance to include a youth employment component in the design of Bank projects across sectors and to add youth employment indicators to monitoring and evaluation systems. Second, the Bank will provide technical and financial support to regional member countries to pursue policies and plans that contribute to better

youth employment outcomes. These efforts will build institutional capacity and position RMCs to increase their employment effects throughout the next decade.

The Bank will work with partners to incubate, implement, assess, and scale promising models to develop youth entrepreneurs and enhancing the skills of youth to meet private sector needs. The models are tailored to country contexts, implemented with the private sector, evaluated, and then refined and scaled up to meet demand. The initial focus is on the Bank's high-priority sectors of agriculture, industry, and information and communication technology. Over time, additional programs will be designed and implemented for other sectors in line with the Bank's High 5 priority areas.

Dedicated financial and human resources are being put in place to achieve the strategy's goals, notably the Youth Entrepreneurship and Innovation Multi-donor Trust Funds and the Boost Africa Investment Fund.

From January 2016 to December 2018, the Bank invested more than \$19 billion in 318 projects integrating job creation, youth entrepreneurship, and equipping young people with employable skills. The projects are expected to create 4.2 direct million jobs over the next five years, more than half of them in low-income

countries and close to a quarter in countries of fragility. The projects will also support more than 200,000 small and medium enterprises and develop the skills of more than 650,000 youth.

Tapera Jeffrey Muzina,
African Development Bank

Digital skills and coding

With the world on the brink of a fourth industrial revolution, the demand for digitization across all sectors has never been greater, generating job opportunities in the information and communication technology (ICT) value chain. Yet, more than 70 percent of Africans still lack access to the internet or digital infrastructures.

The Bank's Coding for Employment Program supports demand-driven ICT curriculum and then matches graduates directly with ICT employers. It also nurtures digital entrepreneurs to enhance youth participation in the rapidly unfolding technological revolution. With funding support from the Rockefeller Foundation (\$2 million), the Bank is leveraging partnerships with Microsoft, Facebook, and Safaricom (in kind support estimated at \$3 million) to help beneficiary institutions develop curricula, hire facilitators, and create content for training and online learning platform.

FOCUS 6

Over 10 years, the program is expected to create more than 9 million jobs, train 234,000 youths, and establish 130 ICT centers of excellence in Africa. A key outcome is that young people will be able to build their own enterprises, creating a ripple effect with their innovation not only creating employment for other young people but also enabling them to access the skills through mentorships and peer-to-peer learning.

Since the program's launch in June 2018, 1,327 young men and women have been trained and an additional 2,750 youth are expected to receive training by the end of 2019. The program is developing 14 innovation centers of excellence. In Senegal and Cabo Verde, the Bank has already invested €80 million to develop technology parks equipped with innovation hubs and demand-driven training and data centers. Other technology parks in development include Angola, Ethiopia, and Nigeria. In Rwanda, the Bank invested \$13 million to develop the Carnegie Mellon University Information and Communication Technology Center of Excellence, with advanced plans to establish a first coding school.

Uyoyo Edosio,
African Development Bank

Multi-donor trust fund for youth entrepreneurship and innovation

The fund is a grant facility created in November 2017 to strengthen the African entrepreneurship ecosystem, with priority to fragile countries and economic hotspots of migration. The fund has grown to almost \$40 million in formal

commitments from Denmark, Norway, Italy, Sweden, and the Netherlands.

The Bank is engaging with continental and national incubators and accelerators to provide tailored business development services, programs, and access to finance youth-led businesses.

- The Tony Elumelu Foundation in Nigeria, as part of its \$100 million program to support 10,000 entrepreneurs from across Africa over 2015–25, is providing \$6.2 million for 1,000 youth beneficiaries in 2019–20, while the Bank provides \$5 million.
- The Africa Guarantee Fund for SMEs is providing access to finance and business development services through partners in 38 countries, unlocking \$1.4 billion and reaching more than 19,000 SMEs.
- The Innovation Village in Uganda is leveraging technology to support 5,000 entrepreneurs, with 40 percent participation by young women.
- Anza in Tanzania is building the capacity of 300 young entrepreneurs in five urban and rural regions in Tanzania (Kilimanjaro, Arusha, Dar Es Salaam, Lindi, and Mtwara) in clean energy, agriculture, education, financial inclusion, and water, sanitation, and hygiene.

The fund will support nearly 4,000 entrepreneurs, 3,000 small enterprises, 100 challenge prize awardees, and create more than 11,000 direct jobs in the next five years. The fund is also supporting research on entrepreneurship ecosystem and feasibility studies for preparation of high employment projects of the Bank.

Ilyes Bdioui,
African Development Bank

The dashboard for enabling youth employment

The EYE Dashboard provides a comprehensive view of a country's youth employment situation, allowing for comparisons over time and across countries. It tracks the state of youth employment and highlight the barriers to, and enablers of, youth participation in economic activities.

The dashboard provides policymakers and researchers with a rich source of information to appreciate the nexus between youth empowerment and economic development in order to formulate and implement the right youth employment policies and action programs. The dashboard has two core indicator groups. The Job Barometer will measure youth employment outcomes, such as job quantity, job equity, and job quality. The Job Enabler will measure the policy and regulatory environment for youth employment, such as the extent to which countries have implemented a set of policies that are known to benefit youth employment.

Youth employment policy and action plans are vital for reviewing key labor market indicators, policies, and institutions for youth employment, identifying key problems for policy priorities, and developing a framework to ensure a comprehensive and coherent approach to youth employment policy. The plans guide the design of objectives, targets, and outcomes for youth employment programs and the roles and respective responsibilities of lead institutions, establishing coordination mechanisms and monitoring

and evaluation arrangements. Some good practices from similar initiatives include:

- Strengthening the (youth) labor market governance system.
- Improving the employability of young people by reforming vocational education and training, introducing a competency-based training system, and establishing an adult learning accreditation system and career guidance services.
- Fostering youth employment by reorienting investment and sectoral policies, linking enterprise and human resource development policies, introducing work-training contracts for fresh entrants to the labor market, and establishing dedicated youth entrepreneurship services.
- Improving decent work prospects for youth by reforming the labor inspectorate to take action against informal employment, promoting the move of young workers and enterprises to the formal economy, and raising awareness of youth on their rights at work.
- Promoting inclusion through better design and targeting of active labor market policies and integrating employment and social services to address multiple layers of disadvantage.

Rosemond Offei-Awuku,
African Development Bank

Empowering youth in agribusiness

The Enable Youth Program (Empowering Novel Agri-Business-Led Employment) is empowering youth at each stage of the agribusiness value chain as “agripreneurs” by harnessing new skills,

technologies, and financing approaches so that youth can establish viable and profitable agribusinesses. The goal is to support the creation of 300,000 youth-led enterprises and 15 million jobs by 2025.

The program has three main components.

- *Enabling environment* covers policy dialogue on issues such as skills development, land tenure with respect to youth and employment services, and changing the “mindset/attitude” of agriculture as a viable and profitable business.
- *Agribusiness incubation* involves training agripreneurs along the agricultural value chain for business development skills such as marketing, financial management, and business plan development—along with mentorship and job attachment.
- *Access to finance* realigns incentives for commercial banks and other financial institutions to reduce lending risks for the financing institutions and building the capacities of agripreneurs through such instruments as risk sharing facilities and start-up seed grants.

The program is also equipping youth by linking them to technical training and learning good practices from countries outside Africa. These include the youth technical training program in Brazil (30 youths), agribusiness SME training in Korea (25 youths in 2 cohorts), the scale-up conference at Purdue University (7 youths), the World Food Prize ceremony in Iowa (8 youths), and the African Green Revolution Forum (8 youths).

The Bank has invested \$374 million in 12 countries over the past four years to

reach 22,000 direct and 110,000 indirect youth beneficiaries. The countries include Cameroon, Democratic Republic of the Congo, Ghana, Guinea, Kenya, Madagascar, Malawi, Mozambique, Senegal, Sudan, Uganda, and Zambia. With greater access to the agribusiness enterprise, and institutional support, youths, with their passion and energy, can become the driving force for Africa’s agricultural transformation.

Edson Rurangwa Mpyisi,
African Development Bank

Boost Africa

Small and medium enterprises make up the majority of businesses in Africa, accounting for some 80 percent of employment. To promote youth employment, it is crucial to support their growth and innovation. But one of the biggest issues facing SMEs is their difficulty in accessing finance.

A joint initiative between the African Development Bank and the European Investment Bank, Boost Africa is one of the flagship initiatives of the Jobs for Youth in Africa Strategy. It promotes investments in the venture segment, including seed funds, incubators, accelerators, follow-on funds, business angel funds, equity-crowd platforms, and venture capital funds to support innovative and highly scalable start-ups and SMEs.

- The investment program spans the venture segment, including seed funds, incubators, accelerators, follow-on funds, business angels funds, equity-crowd platforms, and venture capital funds to support innovative and highly scalable start-ups and

FOCUS 6

SMEs. It focuses on ecosystem builders able to generate first-rate opportunities in terms of quality, creativity, impact, and innovation, from fund managers to accelerators, incubators, and business angels. The investment component is structured as a co-investment partnership between EIB and AfDB, who each commit up to €50 million. Third-party investors from the public and the private sector will be invited to co-invest with the ultimate aim to mobilize a combined amount of €200 million, and leverage €1 billion in additional investments through financial intermediaries. Deploying a blended finance approach, the program expects to build a portfolio of 25 to 30 funds over a 7–8 year period.

- The technical assistance pool provides capacity building and disseminate best practices for the investment readiness of intermediaries, especially first-time local fund managers; the

business and technical training of investee companies/entrepreneurs; and the creation of investors' networks, notably for business angels.

- The innovation & information lab (The Lab) acts as a catalyst for innovation, knowledge, and partnerships by supporting Africa's entrepreneurship ecosystem, incubating, and piloting promising new ideas and assessing best practices for existing interventions in support of youth employment. In addition, the Lab will provide knowledge resources to help mitigate the constraints and challenges entrepreneurs face in Africa and allow them to successfully launch and grow their businesses.

Under the program, the Bank is supporting funds that invest in youth start-ups, and in 2018, it approved two equity investments. For Africa Tech Ventures, the Bank invested \$7.5 million in equity under the Boost Africa program, with a

seat on the advisory committee. To generate 2,500 direct jobs, the fund targets tech start-ups and early-stage innovators and will invest, through syndication, in businesses from West and Southern Africa, with plans to scale up in East Africa. For the Partech Africa Special Limited Partnership, the Bank's equity participation of €7 million will support the development of an ecosystem facilitating the growth of new innovative companies using proven technologies by investing in high value-generating companies to create around 2,800 direct jobs and 19,000 indirect jobs.

Through this integrated approach, Boost Africa will both provide financial capital and develop human capabilities, helping fund managers and entrepreneurs to deal with the many obstacles that arise when building new funds and new enterprises.

Absa Ndeye Gningue,
African Development Bank



HOW MANY JOBS DOES AFRICA NEED TO CREATE?

Arabo Ewinyu, University of Cape Town
Mumbi Kimani, University of Cape Town
Morné Oosthuizen, University of Cape Town
Christopher Rooney, University of Cape Town
Francois Steenkamp, University of Cape Town
Derek Yu, University of the Western Cape and University of Cape Town

African countries have achieved high economic growth over the past 20 years but have succeeded less at growing jobs. Most new workers have only found informal sector employment. And the working age population is about to surge in many countries, posing an immense challenge. Between 2013 and 2063, more than four-fifths of global working age population expansion will take place in Africa.

A detailed analysis of five national labor markets in Africa reveals low youth labor force participation rates and high unemployment rates compared with older workers. Most youth are employed as unskilled or semiskilled workers. Youth in all five countries are less likely than older people to enter the labor market and, when they do, are less likely to find employment.

Between 2013 and 2033, population growth is expected to concentrate primarily in the child and youth cohorts, and the two youngest cohorts will still constitute at least half the working age population in 2063. Policies fostering youth employment should thus remain central, but between now and 2030, countries should also create sustainable systems for elderly support (pensions, social care).


During 2013–63, most African countries will see a demographic window of opportunity when dependent children and dependent older people are less than 45 percent of the population. With the working age population at its peak and the dependent populations relatively small, resources will free up for economic development, human capital,

and better living standards. Countries should invest in education and health, improve governance and transparency, and establish conditions supporting the creation of good quality jobs and inclusive economic growth.

Structural transformation from low-productivity to high-productivity economic activities that require skilled workers is a priority for employment growth, especially among youth. Further, developing entrepreneurial skills in the vast informal sector can improve employment quality and remuneration.

INTRODUCTION

Africa's economic fortunes have improved remarkably over the 2000s. Riding the commodities boom, many countries experienced rapid and sustained economic growth, recovering fairly quickly from the global financial crisis and subsequent economic slowdown. However, while economic output has grown, employment has stumbled. Most new labor market entrants have to settle for



employment in the informal sector because they are unable to find work in the formal sector, where wages are higher and conditions more favorable. As a result, African countries have generally made only slow progress in reducing poverty. And the pattern of employment growth combined with skills shortages means that inequality is becoming an increasing challenge in many countries.

The mammoth challenge of jobs

Unable to create enough jobs even under relatively favorable economic conditions, many African countries now stand on the brink of an unprecedented surge in the working age population. Between 2013 and 2063, the continent's working age population is projected to more than triple, from 627 million to almost 2.0 billion—an increase of more than 1.3 billion people. Growth in the working age population will outpace the continent's population growth over the period. The growth rate in the working age population—2.3 percent a year over the 50-year period—is almost triple the rate in Oceania, which has the second-fastest growth rate in the working age population.

Africa faces a challenge of mammoth proportions. Large cohorts of young people (ages 15–24)—often better educated, more closely integrated into global networks and social media, and more keenly aware of opportunities and conditions in other countries than older workers (ages 25–64)—are already entering the labor market. They bring with them expectations of a better future and, increasingly, the ability to organize and hold governments to account. Thus, countries are facing the challenge of large cohorts of jobseekers for whom there are too few good jobs. In different contexts this problem manifests in different ways, whether in open unemployment, involuntary engagement in informal sector activities, or underemployment in the form of reduced hours or overqualification for the job.

The aim of this study

This study analyzes the jobs challenge in the context of rapid and substantial demographic change.

It looks first at projected population trends over 2013–63, both in total population and in the working age population. Next, it considers the opportunities at both regional and national levels presented by this demographic shift (the demographic dividend). To illustrate the situation, it examines current labor market contexts in five countries (Egypt, Mali, Nigeria, South Africa, and Zambia), highlighting the labor market disadvantage experienced by youth. Then, current estimates of labor force participation and unemployment and projected figures for population growth are used in a multivariate analysis to estimate the labor market implications of demographic change and the number of new jobs needed each month at a regional level over the five decades 2013–63.

GLOBAL AND REGIONAL POPULATION TRENDS

Countries around the world continue to undergo rapid demographic change.¹ The global population is expected to grow by 3.1 billion between 2013 and 2063, 2.9 billion (92 percent) of them in just two regions: Asia and Africa (table 1). Africa alone is projected to account for 63 percent of the growth, boosting its share from 15.7 percent to 29.9 percent. Most of the population expansion over the 50 years between 2013 and 2063 will occur among the working age population in Africa, especially in Central, West, and East Africa.

Global trends in the working age population

The global population shift is even more marked for the working age population (ages 15–64). In 1963, over three-quarters of the working age population was located in just two regions: Asia (54.9 percent) and Europe (21.7 percent; figure 1). Africa accounted for 8.9 percent, while Latin America and the Caribbean and Northern America each had 7.0 percent. Between 1963 and 2013, Asia's share rose 13 percent, while Europe's share halved, to 10.5 percent. Africa's share rose 50 percent, to 13.3 percent. Between 2013 and 2063, the

TABLE 1

Projected global population trends, by region, 2013–63 (millions)

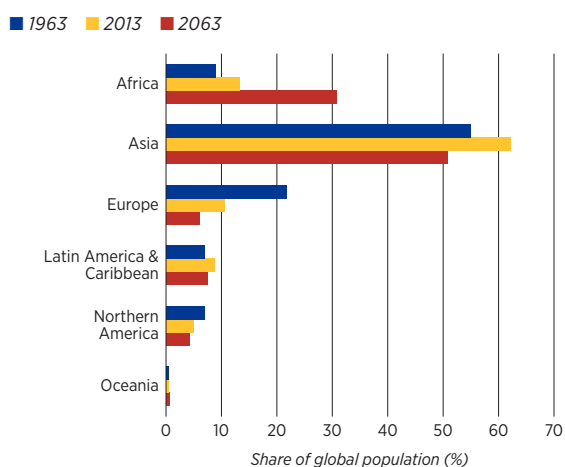
Region	Total population				Working age population			
	2013	2063	Change		2013	2063	Change	
	Number	Number	Number	Average annual (%)	Number	Number	Number	Average annual (%)
Asia	4,331	5,244	913	0.4	2,939	3,243	304	0.2
Europe	740	693	-47	-0.1	498	390	-108	-0.5
Latin America & Caribbean	619	787	168	0.5	411	473	62	0.3
Northern America	351	456	105	0.5	234	268	34	0.3
Oceania	38	62	24	1.0	25	38	13	0.8
Africa	1,135	3,095	1,960	2.0	627	1,969	1,342	2.3
World	7,213	10,338	3,124	0.7	4,734	6,381	1,647	0.6
Africa share (%)	15.7	29.9	62.8	na	13.2	30.8	81.4	na

Source: Calculations based on medium variant projections (UN 2017).

Note: See annex 1 for more detailed disaggregations.

FIGURE 1

Global distribution of the working age population, 1963, 2013, and 2063



Source: Calculations based on medium variant projections (UN 2017).

picture shifts dramatically, with all regions except Africa and Oceania projected to experience a decline in their share of the working age population. The biggest decline is projected for Asia, with its share of the global working age population dropping from 62.1 percent to 50.8 percent. Europe’s share will decline further, dropping from 10.5 percent to 6.1 percent. In contrast, Africa’s share will nearly triple, from 13.3 percent to 30.8 percent. Africa’s working age population will expand by

1.3 billion people, while the rest of the world sees just a 0.4 billion increase. Thus, by 2063, nearly 3 in 10 working age people will reside in Africa, up from 1 in 10 in 2013.

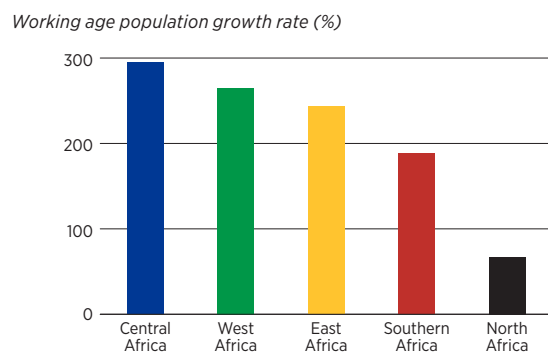
Trends in the working age population in Africa

African countries are at different stages of economic development, which influences their population dynamics. For example, Mauritius is an upper middle-income country, Angola a lower middle-income country, and Uganda a low-income country according to the World Bank classification. Besides income, demographic change is also differentially affected by such factors as level of education (particularly among women), female labor force participation rates, availability of contraceptives, social and economic institutions, and urbanization. In general, wealthier countries with more highly educated populations (especially of women) and higher rates of female labor force participation and urbanization tend to have lower rates of fertility.

In 2013, the largest shares of the working age population were in West Africa (28 percent) and East Africa (26 percent). They were followed by North Africa (19 percent), Southern Africa (15 percent), and Central Africa (12 percent).

These patterns are expected to change over the next 50 years, although all regions in Africa are likely to experience substantial increases in the working age population. Central Africa, the second poorest region (GDP per capita of \$879), is projected to experience the most rapid growth in the working age population over 2013–63, with an average annual growth rate of 2.8 percent (total increase of 295 percent by 2063; figure 2). It is followed by West Africa, the third poorest region (\$1,715), with an average annual growth rate in the working age population of 2.6 percent (total increase of 265 percent), and East Africa, the poorest region (\$798) with an average annual growth rate of 2.5 percent (total increase of 243 percent). Growth of the working age population will be slower in Southern Africa, the richest region (\$3,774), with an average annual growth rate of 2.1 percent (total increase of 188 percent), and slowest in North Africa, the second richest region (\$3,237), with an expected annual growth rate in the working age population of 1 percent (total increase of 66.6 percent). The slower expected growth in North Africa and Southern Africa reflects the generally more advanced state of the demographic transition in countries in these regions, in part because of the higher level of economic development than in other regions. Six countries (Algeria, Botswana, Libya, Mauritius, Namibia, and South Africa) in these two regions are classified as upper middle-income countries.

FIGURE 2
The growth rate of the working age population is projected to differ considerably by region in Africa, 2013–63

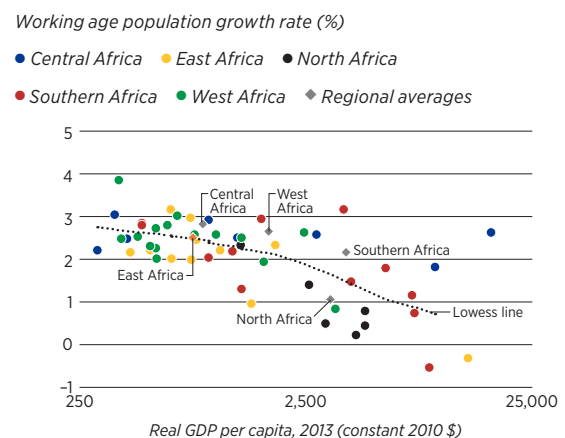


Source: Calculations based on medium variant projections (UN 2017).

Overall, there is a negative relationship in Africa between real GDP per capita in 2013 and the projected growth rate of the working age population over 2013–63 (figure 3): the correlation coefficient between them is -0.7 across countries, as indicated by the negative slope of the fitted regression line. In other words, richer countries are expected to see lower rates of growth in the working age population. This relationship is also evident at the regional level.

Countries with a GDP per capita of less than \$1,000 (in constant 2010 dollars) are clustered in the upper left corner, with working age population growth rates of 2–3 percent a year. This group includes a mix of countries from all five regions, although East and West African countries are more numerous. Among richer countries to the right in the figure, Southern African and North African countries are well represented, with only a small number of countries from other African regions. Indeed, 6 of the 17 countries with per capita GDP of \$2,000 or more are in Southern Africa, while 5 are in North Africa. Of the remaining six

FIGURE 3
There is a negative relationship between GDP per capita and projected working age population growth in African countries and regions, 2013–63



Source: Calculations based on GDP per capita (World Bank 2017) and the medium variant projections for working age population (UN 2017). Note: Real GDP per capita is estimated at a regional level as the population-weighted average of real GDP per capita for each country in each region. The dotted line is a fitted lowess (locally weighted scatterplot smoothing) line for all countries with GDP per capita of \$12,000 or less (all countries in Africa except Seychelles and Equatorial Guinea). Somalia is omitted as GDP per capita data are unavailable. GDP per capita for Eritrea is for 2011.

countries, two are in West Africa, one is in East Africa, and three are in Central Africa.

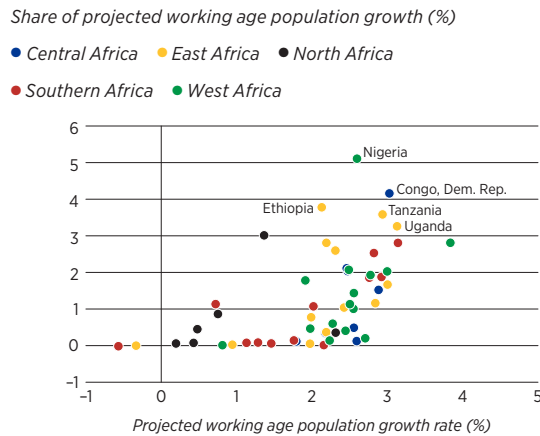
Of the 17 countries, Angola and Equatorial Guinea differ markedly from the others in having a higher projected growth rate of their working age populations. Angola's working age population is projected to increase by 3.1 percent a year over 2013–63, and Equatorial Guinea's by 2.6 percent a year, which is similar to the projected growth rates of countries that are much poorer, such as Senegal and Guinea. However, Angola and Equatorial Guinea are oil exporters, which means that their GDP per capita can fluctuate greatly from year to year.

Countries that are driving the growth of the working age population

While expansion of the total population and of the working age population are key indicators of population change, it is useful to understand which segments of the working age population are expanding most. If growth is concentrated among younger cohorts, the primary policy focus would be on education (to create a supply of skilled workers) and on finding ways to create enough jobs for these rapidly expanding new entrants to the labor market. If growth is concentrated among older working age adults, policies related to pensions and old age care would be more pressing.

Just five countries are expected to account for more than 45 percent of the growth in the working age population over 2013–63: Nigeria (17.7 percent), Democratic Republic of Congo (9.3 percent), Ethiopia (7.1 percent), Tanzania (6.3 percent), and Uganda (5.0 percent; figure 4). (Annex 2 discusses trends in these countries in more detail and analyzes their population dynamics and projected trends by age cohort for each decade between 2013 and 2063.) The next tier of countries includes Egypt, Niger, Kenya, and Angola, which are each expected to account for 3.6–4.1 percent of the expansion in the working age population. These nine countries together will account for 60.4 percent of the expansion in Africa's working age population. While these countries may not necessarily experience the

FIGURE 4
Projected working age population growth and share of working age population in Africa by country, 2013–63



Source: Calculations based on medium variant projections (UN 2017).

fastest growth in the working age population, they will arguably be confronted with the greatest labor market challenges in terms of the sheer numbers of jobs required over the coming decades.

As countries move through the demographic transition, rapid population growth will be expected first among younger members of the working age population and later among older cohorts. Differing rates of population growth across countries would be expected to be reflected in differences in the patterns of growth within their working age populations.

In most of the countries that will account for the largest shares of the growth in the working age population in Africa over the first two decades, population growth is expected to be driven by the two youngest cohorts (ages 15–24 and 25–34). Those cohorts are expected to account for more than 60 percent of population growth between 2013 and 2033 and more than 50 percent between 2023 and 2033, except for Ethiopia and Egypt. In Ethiopia, the child and youth age cohorts are projected to account for 40.9 percent of population growth between 2013 and 2023 and 26.4 percent between 2023 and 2033. For Egypt, the shares are 38.7 percent and 34.3 percent. After 2033, older

age cohorts (ages 55–64 and 65 years and older) are expected to account for around 20 percent of population growth in most countries, but with much higher shares in Ethiopia (45.3 percent over 2043–53 and 67.5 percent over 2053–63) and Egypt (40 percent in both decades, with a third of it among those ages 65 years and older).

With the projected aging of the population from 2030 on, countries should use the time to set up robust, sustainable systems for elderly support (pension systems and social care provision) before they are required by large portions of the population. But even with this projected aging of the working age population, the two youngest cohorts are still expected to constitute 50–60 percent of the working age population by 2063. This suggests that policies focusing on youth, especially on their employment opportunities, should remain a top priority. But while the proportion of youth as a share of the working age population is expanding, this will be the case for only a short period in each country, indicating that governments have a narrow window of opportunity to take advantage of the youth bulge. Finally, the Fourth Industrial Revolution (robotics, artificial intelligence) is expected to make many low-skilled jobs redundant, requiring programs to re-skill workers in order to avoid major labor market dislocations.

ECONOMIC DEPENDENCY AND DEMOGRAPHIC DIVIDENDS

Demographic change results in substantial shifts in the structure of national and regional populations. The effect of such shifts on the macroeconomy, as well as on the provision of social services and infrastructure, can be far-reaching, depending in part on changes in the dependency ratio and the demographic dividend made possible by an expanding share of prime-age workers.

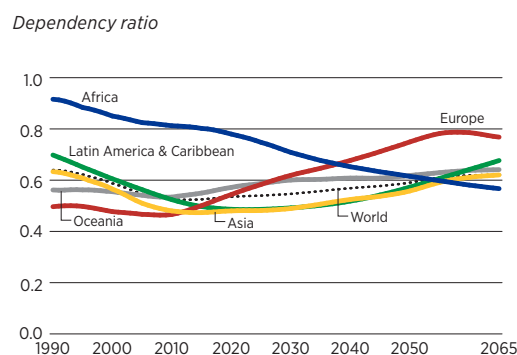
Dependency ratios

One way to assess the implications of a changing population age structure is to examine dependency

ratios—the ratio between the dependent or economically nonproductive population, mainly children and the elderly (the numerator) and the economically nondependent or productive population (the denominator). A higher dependency ratio indicates a larger share of dependents within the total population while a lower dependency ratio indicates a larger share of the productive population. Defining the productive and nonproductive populations in different ways results in different dependency ratios.

Total dependency ratios were calculated globally and for selected world regions. What is immediately evident is the extent to which Africa differs from other world regions (figure 5). Globally, the total dependency ratio fell throughout the 1990s and 2000s, reaching 0.52 in 2012 (meaning that there were 52 children and elderly individuals for every 100 working adults in 2012) before gradually rising again. This pattern is broadly observed for Asia (turning at 0.47 in 2014), Europe (0.46 in 2008), and Oceania (0.53 in 2009), with Latin America and the Caribbean being somewhat of an outlier (turning at 0.49 in 2022) but still conforming to the general pattern. In contrast, the total dependency ratio for Africa is projected to continue falling throughout the remainder of the

FIGURE 5
Total dependency ratio by global region, 1990–2065



Source: Calculations based on medium variant projections (UN 2017) and definitions of dependency and productive and nonproductive population (World Bank <http://databank.worldbank.org>).

Note: In calculating the total dependency ratio, the nonproductive population is defined as children (ages 0–14) and the elderly (ages 65 and older), while the productive population is defined as those ages 15–64.

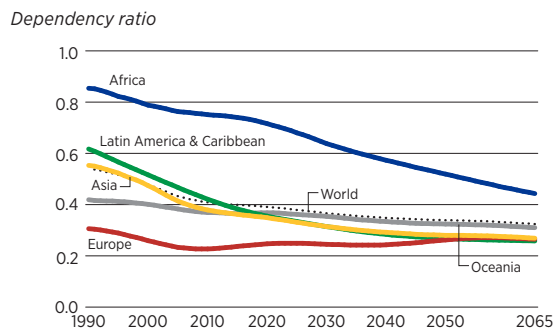
period to 2063, after falling from almost 0.92 in 1990 to 0.80 in 2017. And the dependency ratio in Africa is substantially above the global average in 2017 of 0.53. It is projected to remain higher than the global average until the mid-2050s, after falling below the ratio for Europe in the late 2030s. During 2053–63, Africa’s dependency ratio is projected to continue to fall further—below the global average and below the other regional averages.

The dependency ratio in Africa declined only gradually over 2006–17, falling between 0.1 percent and 0.5 percent annually. However, the continent is poised for an accelerated decline, with the total dependency ratio expected to fall by roughly 1 percent a year over 2024–35, slowing again to roughly 0.5 percent a year by 2063. While this represents a rapid structural change for the continent, the decline is not rapid in regional comparison. Between 1990 and 2010, for example, dependency ratios declined 1.3–1.5 percent annually in Latin America and the Caribbean and 1.2–2.3 percent annually in Asia.

Like the total dependency ratio, the child dependency ratio (the ratio of the child population under the age of 15 to the working age population ages 15–64) for Africa has been declining, falling from 0.85 in 1990 to an estimated 0.73 in 2017 (figure 6). The ratio is projected to continue falling, reaching 0.50 in 2053 and 0.45 by 2063. It is estimated to have fallen 11.1 percent over the 20 years 1993–2013 and is projected to fall a further 39.4 percent over the 50-year period 2013–63. The fall is the result of declining fertility rates, and even though the absolute number of births may continue to rise, children will represent a declining proportion of the overall population over time.

In contrast, the global child dependency ratio is estimated to have fallen faster than in Africa between 1993 and 2013, at 23.8 percent, but then at a slower 18.7 percent between 2013 and 2063. A similar pattern is observed in Asia (a 31.6 percent decline, followed by a 26.1 percent decline), while Europe will see its child dependency ratio rebound from the 0.23 recorded in 2010. At least for the

FIGURE 6
Child dependency ratios by global region, 1990–2065

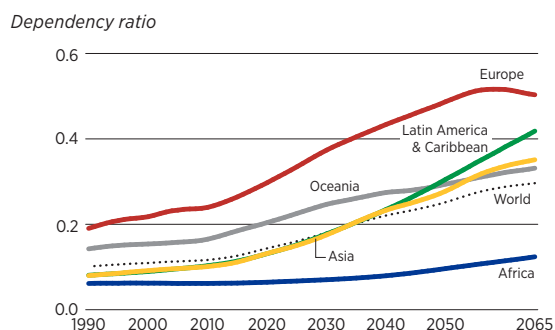


Source: Calculations based on medium variant projections (UN 2017).

initial 20 years of the 2013–63 period, falling child dependency ratios will lower the total dependency ratio in all regions in figure 6.

While child dependency ratios are projected to decline, elderly dependency ratios (ratio of the elderly population ages 65 years and older to the working age population ages 15–64) are expected to rise over the period (figure 7). The global average is projected to almost triple from 0.10 in 1993 to 0.29 in 2063, meaning that there will be 29 elderly people for every 100 working age individuals. At the regional level, particularly dramatic increases are expected for Asia (a 315.7 percent increase to 0.35) and Latin America and the Caribbean (a 384.1 percent increase to 0.40). Even with its youthful population, Africa will see a doubling of

FIGURE 7
Elderly dependency ratio by global region, 1990–2065



Source: Calculations based on medium variant projections (UN 2017).

the elderly dependency ratio from 0.06 to 0.12. Its low base and relatively slow rate of increase means that by 2063, the continent's elderly dependency ratio is projected to be only two-fifths of the global average, the only one of the five regions to be below the average.

It is the combination of a slowing decline in the child dependency ratio and an increasingly rapid rise in the elderly dependency ratio that will be causing the total dependency ratios of Europe, Asia, Oceania, and Latin America and the Caribbean to bottom out during the 15 years from 2008 onward. However, in Africa, the child dependency ratio begins the period at a much higher level and, combined with a muted rise in the elderly dependency ratio, results in the total dependency ratio falling continuously over the period. The result is a vastly different population structure for the continent: in 2013, there were an estimated 75 children and 6 elderly people (81 dependents in total) for every 100 working age individuals; by 2063, it is projected that there will be only 45 children and 12 elderly people (57 dependents in total) for every 100 working age individuals.

The demographic window of opportunity and the demographic dividend

Countries around the world are at different stages of the demographic transition—the transition from equilibria characterized by high mortality and high fertility rates to equilibria characterized by low mortality and low fertility. However, declines in fertility and mortality do not occur at the same pace; mortality, particularly among infants and children, declines first and is followed later by declining fertility. This means that fertility may remain at relatively high levels even after mortality has fallen. The result is the creation of “boom generations,” or unusually large cohorts that gradually move from childhood into prime working ages and eventually old age.

The demographic window of opportunity refers to a stage of the demographic transition during which the working age population comprises a

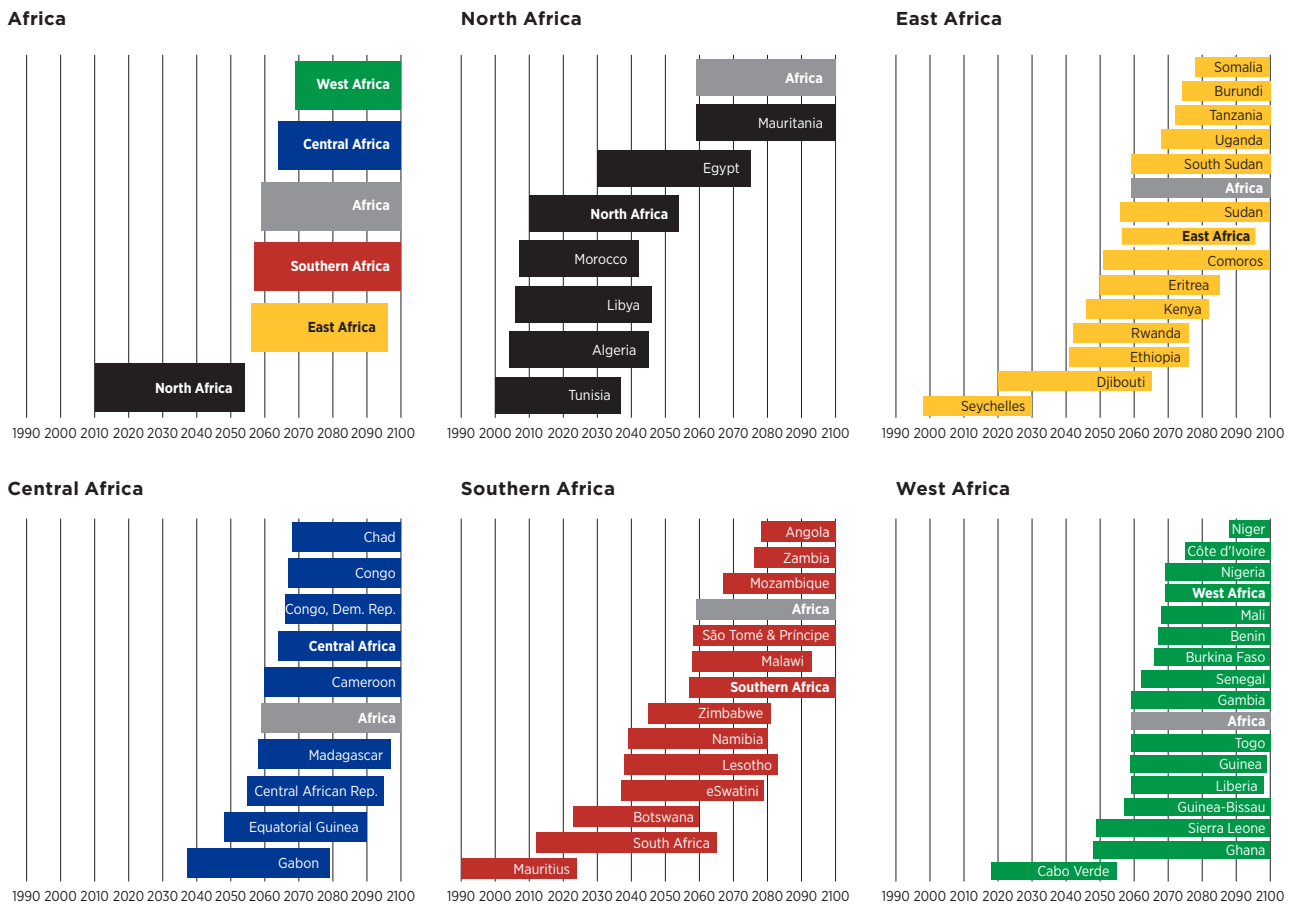
particularly large share of the population. With a relatively large working age population, it is easier for societies to make the necessary investments in human and physical capital to boost living standards and economic development.

While not defined precisely, the demographic window of opportunity is generally considered to open once the proportion of children and youth under age 15 falls below 30 percent of the population and the proportion of people ages 65 and older remains below 15 percent. While the window is open—a period typically lasting three to four decades—the working age population is particularly prominent (and dependency rates are therefore relatively low). An important determining factor is the rate at which fertility declines, with more rapid declines associated with greater impacts. However, “the more favorable this event, the shorter the golden age will be.”²

Figure 8 illustrates the periods during which the window of opportunity is projected to be open for Africa as a whole, for the five regions, and for 54 African countries. For Africa as a whole, the window of opportunity will not open until 2059 and will remain open into the next century. However, this figure obscures considerable geographic variation. In North Africa, for example, the window of opportunity opened in 2010 and is expected to remain open until 2054. In East Africa and Southern Africa, the window of opportunity is not expected to open until 2056 and 2057 (soon after the window closes for North Africa). For East Africa, the window will remain open until 2096, but for Southern Africa it will remain open beyond 2100. The window is projected to open for Central Africa in 2064, followed by West Africa five years later. Thus, only in North Africa and East Africa is the window of opportunity projected to close before the end of this century.

There is even greater variation at a national level. Southern and North African countries dominate the countries whose window of opportunity opens before 2040. Mauritius saw its window of opportunity open first, before 1990, followed by

FIGURE 8
Demographic window of opportunity for African regions and countries, 1990–2100



Source: Calculations based on medium variant projections (UN 2017).
 Note: Windows of opportunity are assessed between 1990 and 2100; in a large number of the countries presented, the window of opportunity is projected to remain open beyond 2100, while in Mauritius it opened prior to 1990.

Seychelles (1998), Tunisia (2000), Algeria (2004), Libya (2006), Morocco (2007), and South Africa (2012). West and Central African countries are more likely to see their window of opportunity open in the second half of the 21st century. Thus, half the North African countries had already seen their windows of opportunity open by 2006. This is not projected to occur until 2039 for Southern Africa, 2051 in East Africa, 2058 in Central Africa, and 2059 in West Africa.

Economic dependency and the demographic dividend

Dependency ratios assume that the population can be divided neatly into productive and

nonproductive (or nondependent and dependent) groups according to age, as described above. While this assumption is useful from an analytical perspective, the discrete changes between dependency and nondependency do not reflect social and economic realities, such as child labor, unemployment, gender differences in labor market participation, early retirement, or post-retirement age employment.

Constructing National Transfer Accounts

One way to get a better sense of the economic dependency of various age cohorts is to construct National Transfer Accounts (NTA) for analyzing the generational economy, defined as “the social institutions and economic mechanisms used by

each generation or age group to produce, consume, share, and save resources.³³ In essence, these institutions and mechanisms refer to the ways in which societies organize these functions and include aspects such as families, social and cultural norms, regulations, and government programs. NTAs comprise profiles of economic flows by single-year age cohorts, from age 0 to the very oldest. For any individual, resource inflows must equal outflows (sources must equal uses) and the following identity holds:

$$Y^l + Y^A + \tau^+ = C + \tau^- + S \quad (1)$$

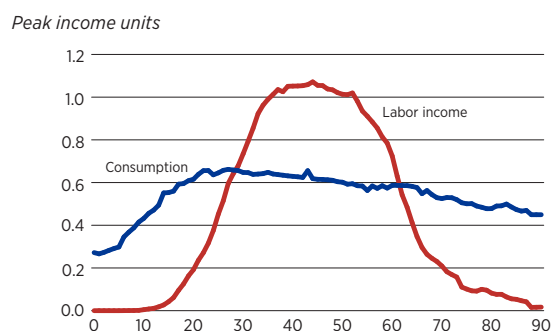
In other words, individuals can receive resources in the form of labor income (Y^l), asset income (Y^A), and transfer inflows (τ^+), while these resources can be used for consumption (C), transfer outflows (τ^-), or savings (S). This identity can be rewritten as:

$$(C - Y^l) = (\tau^+ - \tau^-) + (Y^A - S) \quad (2)$$

with the difference between consumption and labor income (the term on the left) known as the lifecycle deficit. These profiles are calculated as per capita values across the entire population (including individuals with zero values for a given flow). The resulting profiles take into account the many variables that affect these flows at different ages. For example, the labor income profile takes into account differences in labor force participation rates at different ages, as well as differences in wages, hours worked, unemployment rates, and many other factors.

Labor income and consumption profiles for 21 African countries for which NTA data are available are shown in figure 9. These are per capita profiles expressed as peak income units, defined as the mean labor income of individuals ages 30–49 and presented as median profiles. Profiles for individual countries will differ from these median profiles, depending on the country’s social, economic, institutional, and cultural context, but the general shape is consistent across the vast majority of countries globally. In effect, the profiles are

FIGURE 9
Labor income and consumption across the lifecycle, median profiles for 21 African countries with National Transfer Accounts data for 2017



Source: Calculations based on medium variant projections (UN 2017) and labor income and consumption data from the NTA database (Lee and Mason 2011).
 Note: Profiles are estimated as the median for all 21 African countries for which data are available.

the best approximation of the true profiles for the continent based on the data currently available.

The labor income curve begins at zero, since infants and very young children do not earn labor income. As children get older and some of them start working, the labor income profile slowly rises, accelerating during the teen years and the early 20s as more young people enter the labor market. Labor income peaks during the late 30s and the 40s and then begins to decline. Around age 60, it starts to fall rapidly, with the decline slowing somewhat from age 65 onward, especially after the late 70s.

The consumption profile begins relatively low, at 25–30 percent of peak labor income, and then rises rapidly as children enter the school-going years. Per capita consumption peaks during the 20s, 30s, and early 40s and then begins to decline gradually with age. The per capita consumption peak is considerably lower than the labor income peak, and the difference is either transferred or saved.

Estimating the size of the demographic dividend

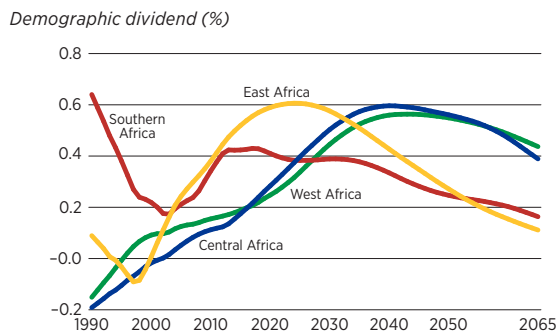
These per capita profiles can be combined with population projections to estimate the size of the demographic dividend by calculating the support

ratio. The support ratio is the ratio of aggregate labor income (the population-weighted labor income profile, often referred to as the number of effective producers) to aggregate consumption (the population-weighted consumption profile, or the number of effective consumers). A higher value for the support ratio means that the number of effective producers is high compared with the number of effective consumers, implying a lower level of dependence on the producers of labor income. Conversely, a lower support ratio means that the number of effective producers is low compared with the number of effective consumers, implying a higher level of dependence on the producers of labor income.

The rate of change in the support ratio captures the accounting effect of the demographic dividend.⁴ In other words, if all else is kept constant and only the population structure changes, a change in the support ratio results in a proportional change in per capita consumption. A rising support ratio implies an increase in the ratio of effective producers to effective consumers (falling dependency); this is the first demographic dividend.

Regional demographic dividends can be estimated for Africa by constructing regional labor income and consumption profiles using the median value at each age across all countries within the region for which there are NTA data (ranging from two countries in East Africa to eight countries in West Africa; NTA data are available for only one country in North Africa, so estimates are not provided for that region). These median profiles are then combined with projections of regional populations to estimate the support ratio and its rate of change (the first demographic dividend; figure 10). The magnitude of the demographic dividend (plotted on the y axis of figure 10) can be interpreted as the increase in consumption made possible in a given year by the changing population age structure. Since NTA data are not available for all countries, the estimates must be considered indicative rather than precise.

FIGURE 10
Simulated first demographic dividend by region in Africa, 1993-2063




Source: Calculations based on medium variant projections (UN 2017) and labor income and consumption data from the NTA database (Lee and Mason 2011).

Note: Simulated demographic dividends are based on regional population projections and median consumption and labor income profiles for each region, based on the countries for which National Transfer Accounts data are available. North Africa is not included due to insufficient data. East Africa includes Ethiopia and Kenya; Central Africa includes Cameroon, Central African Republic, Chad, and Gabon; Southern Africa includes Botswana, Mozambique, Namibia, São Tomé and Príncipe, South Africa, and eSwatini; and West Africa includes Burkina Faso, Côte d'Ivoire, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, and Senegal. Projections for global regional aggregates are in figure A1.3 in annex 1.

The first demographic dividend generally occurs much earlier than the opening of the demographic window of opportunity, which is expected to open in each of the four regions between 2050 and 2070, with North Africa's having opened much earlier. In contrast, all regions are already at different stages of experiencing the first demographic dividend.

Southern Africa is the frontrunner. A large proportion of the region's demographic dividend occurred before 1990, when the region is estimated to have been enjoying a large demographic dividend of close to 0.6 percent a year. This is in line with the region being relatively advanced in its demographic transition, as well as the disproportionate impact of the HIV/Aids pandemic on working age cohorts. South Africa, for example, is estimated to have experienced a positive demographic dividend beginning in the 1970s, with steep declines in its magnitude during the 1990s.⁵ Southern Africa experienced a rapid decline in the dividend during the 1990s, when it fell below 0.2 percent a year. Although the dividend has recovered slightly, to 0.4 percent a year, it is projected to fall gradually to below 0.3 percent in 2042 and below 0.2 percent in 2057.



East Africa's first demographic dividend began around 2000—although it was also positive before the mid-1990s—and is expected to peak at 0.6 percent a year in the mid-2020s. The dividend is expected to decline somewhat more steeply than in Southern Africa, falling below 0.4 percent a year by 2042 and below 0.2 percent in 2056. Thus, by the end of the period, the first demographic dividend in East Africa is projected to be at a similar level to that of Southern Africa.

The first demographic dividends in Central and West Africa are projected to follow similar trends. Having turned positive in the mid-1990s in West Africa and in the early 2000s in Central Africa, the dividends have remained low. However, the regions are at an inflection point, with the dividend projected to rise rapidly over the next two decades. For Central Africa, the peak is projected to arrive in the late-2030s and early 2040s, at just under 0.6 percent a year. In West Africa the peak will occur slightly later and at a slightly lower level. By 2063, the dividend is projected to be around 0.4 percent a year, two to three times the levels in East and Southern Africa.

These estimates of the demographic dividend are revealing in several ways. First, the demographic dividend is not decades in the future but has already begun in all four regions, with North Africa even further ahead. Thus, there is an urgent need to create policy environments that are favorable to reaping the full benefits of the first demographic dividend and that prepare for the second demographic dividend. Second, differences in population trends and age-related patterns of labor income and consumption mean that there is likely to be considerable variation across African countries in the timing and magnitude of the first demographic dividend. More national-level analysis of the impact of aging on the macroeconomy is needed to enable countries to craft appropriate policies. Third, the projected demographic dividends in Africa are muted compared with those in rapidly growing East and Southeast Asian economies, though longer lasting. Finally, these projected demographic dividends are based on

static profiles of labor income and consumption. Changes in these profiles may accentuate or mute the demographic dividends, meaning that specific improvements in aspects such as labor market outcomes could have a significant impact on a country's ability to secure the dividend.

Neither the demographic window of opportunity nor the first demographic dividend will materialize without declines in fertility. Development plans for countries in Sub-Saharan Africa almost universally ignore the role of demographics in economic development, with few plans even including demographic projections.⁶ Further, while many African economies aspire to emerging market economy status, policymakers fail to recognize that, without exception, emerging market economies have achieved or are completing their fertility transitions.

YOUTH AND THE LABOR MARKET

While the strong economic growth of recent decades in many African countries was accompanied by job creation, it was insufficient to absorb the rapid expansion in new labor market entrants. Young job seekers were particularly affected by this mismatch between job growth and labor force growth: the International Labour Organization (ILO) estimates that only one in five jobs created in Africa over 2000–08 went to youth ages 15–24.⁷ Prioritizing the creation of productive employment opportunities for Africa's rapidly growing youth population is a challenge, but it promises rewards that will result in greater prosperity for these countries.

Employment opportunities in developing countries often mirror the pace and nature of the structural transformation of the broader economy.⁸ Economic and social development requires job opportunities for youth that are well matched to their skills and abilities and that will allow them to transition to secure livelihoods. Not enough of these opportunities are available to youth in Africa.

A closer look at employment, especially youth employment, in Africa reveals high rates of working poverty, vulnerable⁹ employment, and underemployment across all occupations.¹⁰ Vulnerable employment is the most prevalent form of youth employment in most African countries. The probability of being in vulnerable employment increases for youth in rural areas and for those with little education.

Relative to other global regions, employment in Africa is more concentrated within the informal sector.¹¹ Self-employment is the predominant form of informal employment, accounting for 80 percent of employment in Kenya, Ghana, Mali, and Madagascar.¹² Women and youth work disproportionately in the informal sector. An estimated 75 percent of employed women in Sub-Saharan Africa are in informal employment compared with 61 percent of men,¹³ and 80 percent of employed youth compared with 66 percent of the total working age population.¹⁴

Employed youth in Africa are typically employed in family-based agriculture.¹⁵ A majority of youth are employed in services, sales, and self-employment or business ownership. The share of youth working on a family-owned farm is significantly higher in lower-income countries (38 percent) than in upper middle-income countries (4 percent).¹⁶ Older working adults are more likely than youth to be employed as professionals, occupations that require financial and time investments in gaining an education and experience. Consequently, they tend to have higher wages and are less likely to be in vulnerable employment.

Youth also have more difficulty than older workers finding jobs. In most African countries, unemployment rates are considerably higher among youth than adults. This discrepancy is particularly severe in middle-income countries. In 2009 in North Africa, youth unemployment was estimated at 23.4 percent, and the estimated ratio of youth-to-adult unemployment was 3.8; in South Africa, 54.2 percent of economically active youth were unemployed, 2.5 times the rate for older adults.¹⁷

At the same time, Africa's growing youth population is becoming better educated. Average educational attainment levels of younger cohorts often exceed those of their parents' generation. Based on current trends, an estimated 59 percent of youth ages 20–24 will have a secondary school qualification by 2030, compared with 42 percent in 2012.¹⁸ Correspondingly, the share of youth with higher education is also expected to increase, particularly in countries where appropriate investments are made in education. As average educational attainment levels rise, so does the potential for rising employment in more highly skilled occupations. Whether such employment opportunities materialize depends on the patterns and expansion of labor demand. High unemployment rates among college graduates are often the result of insufficient demand for labor generally but may also point to skills mismatches in the labor market.

Mismatches between the skills demanded by firms and those acquired by youth lead to higher unemployment among this cohort of workers. Skills mismatches may be the outcome of a poor quality of education and the absence of linkages and information feedback loops between the education and training system and employers. Additionally, higher education tends to be considerably more expensive in technical fields than in social sciences, which limits the expansion of technical facilities and therefore the number of skilled workers. A possible solution is to encourage private sector investment in these institutions, while retaining government responsibility for oversight.

Descriptive analysis of the place of youth in national labor markets

To shed light on the differences in labor market outcomes between youth (ages 15–24) and older workers (age 25–64), outcomes were analyzed in five African countries (Egypt, Mali, Nigeria, South Africa, and Zambia). While looking at five countries is insufficient to fully account for the extent of variation across countries in Africa, it can give a general sense of the challenges facing youth in the labor market and identify areas needing policy attention

in the context of the unprecedented expansion of the labor force expected in coming decades.

Broad profile of the youth labor force

In Egypt, Mali, Nigeria, South Africa, and Zambia, older workers are much more likely than youth to participate in the labor force (table 2). This is unsurprising considering that many young people ages 15–24 are still pursuing their education. Youth labor force participation rates range from 30 percent in South Africa to 62 percent in Mali (32 percentage point difference), a wider spread than for older workers, whose participation rates range from 59 percent in Egypt to 86 percent in Nigeria (27 percentage point difference). High labor force participation rates among youth in low-income countries suggest that young people in poorer countries are compelled to find any employment so as to earn a living, a reflection of high poverty rates and an absence of social protection programs. In middle-income countries, many youth are unemployed,

underemployed, or discouraged, despite higher education levels.¹⁹

Unemployment rates (proportion of the labor force that is unemployed) vary considerably across the five countries. An estimated 54.2 percent of youth in the South African labor force were unemployed in 2015 (see table 2). This is almost two-thirds higher than the unemployment rate for Egyptian youth (33 percent). In contrast, youth unemployment rates are much lower in Nigeria (11.6 percent) and Zambia (17.8 percent).

Youth are more likely to be unemployed than older workers. The 54.2 percent unemployment rate of young labor force participants in South Africa is more than double the 23.8 percent rate for older workers. Mali, which has the highest youth labor force participation rate among the five countries, has the second highest youth unemployment rate. At 43.0 percent, it is roughly 16 times that of older workers.

TABLE 2
Youth labor market profiles of five African countries, most recent year available

Category	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	1,000s	Ratio	1,000s	Ratio	1,000s	Ratio	1,000s	Ratio	1,000s	Ratio
Youth (ages 15–24)										
Working age population	15,861	1.00	2,285	1.00	29,515	1.00	9,653	1.00	3,065	1.00
Labor force	5,480	.35	1,410	.62	11,137	.38	2,872	.30	1,328	.43
Employed	3,650	.23	986	.43	9,844	.33	1,314	.14	1,092	.36
Unemployed	1,830	.12	424	.19	1,293	.04	1,558	.16	236	.08
Not economically active	10,381	.65	875	.38	18,378	.62	6,781	.70	1,737	.57
Non-youth (ages 25–64)										
Working age population	36,882	1.00	5,500	1.00	67,197	1.00	25,109	1.00	4,309	1.00
Labor force	21,632	.59	4,091	.74	57,975	.86	19,541	.78	3,674	.85
Employed	19,904	.54	3,982	.72	56,277	.84	14,889	.59	3,485	.81
Unemployed	1,728	.05	109	.02	1,698	.03	4,652	.19	189	.04
Not economically active	15,250	.41	1,408	.26	9,223	.14	5,568	.22	635	.15
Other statistics										
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Labor force share (%)	20.2	79.8	25.6	74.4	16.1	83.9	12.8	87.2	26.5	73.5
Unemployment rate (%)	33.4	8.0	43.0	2.7	11.6	2.9	54.2	23.8	17.8	5.1

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Ratios are calculated as a share of the working age population, not of the labor force.

There are also variations in youth unemployment based on demographic and other characteristics. Female youth unemployment is highest in Egypt, at 50.4 percent, and in South Africa, at 58.4 percent. In Egypt the female youth unemployment rate is almost double the male rate (28.2 percent). In South Africa, however, the gender differential is less than 10 percentage points. These differences may indicate that women face more significant barriers to finding employment in Egypt than in South Africa. In particular, policy interventions aimed at getting young people into jobs must recognize such within-group differences.

Realizing the demographic dividend is integrally linked to employment—specifically to high proportions of the population being productively engaged in the economy. The ratio of employment to the working age population gives an indication of those proportions. Among youth, the employment-to-population ratio is 0.14 in South Africa—meaning that just 14 percent of all 15- to 24-year-olds are employed—but it is as high as

0.43 in Mali. Among the older working age population (ages 25–64), the employment-to-population ratio ranges from 0.54 in Egypt and 0.59 in South Africa to 0.81 in Zambia and 0.84 in Nigeria. The low ratios in Egypt and South Africa are explained by relatively low female labor force participation rates in Egypt and very high unemployment rates in South Africa.

Employment and individual characteristics

There are marked differences in the composition of employment among youth and older workers in the five countries according to several characteristics, including gender, educational attainment, and location (table 3).

Gender. Men tend to dominate employment in all age groups. Men account for particularly large shares of employment among South African youth (58.3 percent) and Malian older workers (57.5 percent). Women account for a majority of the employed in only three cases: among Egyptian older workers (51.3 percent) and among

TABLE 3

Employment shares across selected individual characteristics in five African countries, latest available years

Percent

Individual characteristic	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Gender										
Male	54.8	48.7	50.7	57.5	47.6	53.4	58.3	55.5	48.4	55.2
Female	45.2	51.3	49.3	42.5	52.4	46.6	41.7	44.5	51.6	44.8
Education										
None	29.4	35.1	64.6	78.2	42.1	34.2	0.6	2.0	14.1	13.8
Primary	21.8	10.1	21.9	10.5	13.6	21.7	7.3	11.0	48.4	41.7
Incomplete secondary	—	—	12.0	5.8	5.7	3.7	35.8	32.5	25.1	22.9
Complete secondary	37.8	31.6	1.2	3.4	34.2	26.8	42.0	30.5	11.1	15.4
Postsecondary diploma/certificate	2.5	4.5	—	—	3.2	7.2	8.8	11.8	0.8	5.1
Degree	8.4	18.8	0.3	2.0	1.0	6.1	4.8	11.1	0.1	0.7
Unspecified	—	—	—	—	0.2	0.2	0.8	1.1	0.4	0.4
Urban or rural locale										
Urban	35.7	43.3	21.6	24.3	16.9	30.8	76.0	76.0	26.3	60.8
Rural	64.3	56.7	78.4	75.7	83.1	69.2	24.0	24.0	73.7	39.2

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigerian Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Shares are calculated within age groups in each country. Percentages within each category may not sum to 100 because of rounding.

Nigerian youth (52.4 percent) and Zambian youth (51.6 percent). One of many possible factors could be at play in affecting gender differences in youth employment is the fact that boys are kept in school longer, while girls are withdrawn from school to work.

Education. Older workers in all countries have an advantage in postsecondary qualifications since much of the accumulation of these qualifications occurs during the ages of 15–24. Nonetheless, there is considerable variation across countries: 23–24 percent of employed older workers in Egypt and South Africa have postsecondary qualifications, compared with around 6 percent in Zambia and 2 percent in Mali. Similarly, more than 10 percent of employed youth in South Africa and Egypt have postsecondary qualifications, compared with less than 1 percent in Zambia and Mali. In four of the five countries, employed youth are more likely to have low levels of education (incomplete secondary or less) than older workers, except in South Africa where less than two percentage points separate youth (43.7 percent) and older workers (45.5 percent), the result of rapid increases in educational attainment over the past decade or so. In Egypt, Nigeria, and South Africa, employed youth are more likely than older workers to have completed secondary education. In contrast, Malian youth have low education and skill levels, which further limits their ability to enter the labor market and transition to high wage jobs.²⁰

Urban or rural locale. In general, employed youth are more likely than older workers to live in rural areas. However, the difference ranges from slight in Mali (a difference of 3 percentage points) to dramatic in Zambia (more than 34 percentage points). This spatial mismatch between youth employment (mostly rural) and economic activity (mostly urban), particularly high-productivity economic activity that older cohorts seem more able to access, represents a key challenge in absorbing youth into employment. South Africa is something of an outlier as more than three-quarters of youth and older worker employment is in urban areas.

This difference reflects the country's higher level of urbanization: over 65 percent of South Africa's population lives in urban areas compared with an average of 45 percent in the other four countries.²¹ Zambia is another outlier. Its spatial mismatch between youth employment and economic activity may arise from age-related differences in access to public sector employment, which is overwhelmingly urban.

Employment type and sector

Examining the distribution of youth and older age workers by employment type (employees, self-employed, or unpaid family members, for example) and sector (public/private and formal/informal) is also revealing (table 4). Differences in the questions on labor force surveys in each country make direct comparisons difficult, but certain observations are possible.

Youth seem less likely than older workers to be in more independent employment arrangements. For example, in countries with data on employment type, youth are substantially more likely to be unpaid family workers than older workers are. Youth are 8.5 times more likely than older workers to be an unpaid family worker in Nigeria, 3.3 times more likely in Egypt, and 2.5 times more in Mali. In Zambia, youth are 2.9 times more likely to be “other employees,” a category that includes unpaid family workers. Youth are also much less likely to be employers or own-account workers.

The pattern for employees varies considerably across countries. In South Africa, with its small informal sector, employee is the dominant employment type, accounting for 92.4 percent of youth employment and 84.2 percent of employment of older workers. In Egypt, where the employee category also dominates, but to a lesser extent, it accounts for around 60 percent of both youth and older workers. However, in Nigeria and Zambia, where relatively few of the employed are employees, youth are less likely to be employees than are older workers. Mali, although similar to Nigeria and Zambia in this regard, differs in that

TABLE 4

Employment type and sector in five African countries, latest year available (percent)

Employment type or sector	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Employment type										
Employee	60.4	62.2	20.6	18.7	5.6	14.5	92.4	84.2	17.9	25.8
Other employees (e.g., apprentices, unpaid family workers)	0.0	0.0	—	—	2.7	0.8	—	—	50.2	17.3
Employer	2.2	13.3	0.2	1.04	—	—	1.6	5.9	0.1	0.4
Own-account worker	8.1	15.8	24.4	58.2	53.6 ^a	80.2 ^a	4.6	9.5	31.7	56.4
Unpaid family worker	27.9	8.4	54.7	22.1	38.1	4.5	1.4	0.4	0.0	0.0
Employment sector										
Public sector	4.9	30.7	0.3	4.0	—	—	6.8	18.0	2.0	8.5
Private sector	93.7	69.0	99.7	96.1	—	—	93.1	81.7	47.2	64.3
Unspecified/don't know	1.4	0.3	—	—	—	—	0.1	0.2	50.8	27.1

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Values may not sum to totals because of unspecified responses and rounding.

a. Refers to the sum of workers classified as agricultural and nonagricultural self-employed.

youth are slightly more likely (20.6 percent) than older workers are (18.7 percent) to be employees.

Of the four countries with data, Egypt and South Africa have the largest public sectors as a proportion of total employment. Youth are nearly absent from public sector employment. In Egypt, 30.7 percent of older age employment is within the public sector but just 4.9 percent of youth employment. A similar, if weaker, bias against youth is observed in the other four countries; for instance, in South Africa only 6.8 percent of youth employment is in the public sector compared with 18.0 percent of older age employment. Even in Mali and Zambia, where the public sector is a much smaller share of total employment, a similar pattern is observed. In Zambia, the public sector share of youth employment (2.0 percent) is less than a quarter that of older age employment (8.5 percent); in Mali, youth are virtually absent from the public sector (0.3 percent compared with 4.0 percent for older workers).

Youth are more likely to be employed in primary sector activities and less likely to be employed in services sector activities than older age workers (table 5). In all of the countries except South

Africa, the primary sector is the largest employer of youth, accounting for between 35 percent of youth employment in Egypt and 70.3 percent in Mali. In line with findings reported earlier that a large proportion of employed people in South Africa are in urban areas, just 10.3 percent of youth and 8.0 percent of older workers are employed in primary sector industries in that country. Zambia, with the highest share of youth working as unpaid family workers, has the second largest share of youth working in agriculture, estimated at almost two-thirds.

Across all countries, the services sector accounts for a larger share of employment among older workers than among youth, ranging from 3.5 percentage points more in South Africa to almost 20 percentage points more in Egypt. In Egypt, this reflects a particularly large gap for employment in community, social, and personal services: just 5.1 percent of employed youth compared with 23.2 percent of employed older age workers, a difference that maps well to the public sector difference observed earlier. In Nigeria and Zambia, the gap is driven by the especially large gaps between youth and older worker employment in wholesale and retail trade (6.1 and 4.0 percentage points)

and in community, social, and personal services (6.9 and 5.5 percentage points). In Mali the transport sector drives a 4.7 percentage point wedge between the two groups.

The industry sector varies substantially across countries in the overall share in employment and in the shares of youth and older age employment. The sector employs a substantial proportion of the workforce in Egypt and South Africa, accounting for between one-fifth and one-third of employment of both groups. The sector is smaller in Nigeria and Zambia, employing roughly one-tenth of the workforce; in Mali, it accounts for less than 6 percent. Only in Egypt is there a significant difference between youth employment (32.8 percent) and older worker employment in the industry sector (22.3 percent). This difference is driven largely by the construction industry, which accounts for 18.8 percent of youth employment and 10.2 percent of older age workers. Except in Zambia, manufacturing accounts for a slightly larger share of youth employment than employment of older workers. And youth are more than twice as likely as older workers to be employed in the services sector in private households in Nigeria and Zambia, and the reverse is true in Mali and South Africa.

Overall, therefore, besides agriculture, youth are most often employed in wholesale and retail trade, manufacturing, and construction. These sectors are often, though not necessarily, characterized by greater vulnerability in employment. South Africa is an exception as a services-driven economy: the services sector employs 67.3 percent of youth workers, more than two-fifths of them in the wholesale and retail sector. In addition, the large share of youth workers in the finance sector likely relates to the classification of temporary employment services workers within the broader finance category.²²

Employment by occupation

The distribution of employment across occupations and skill categories is important because of the correlation between skill levels and

remuneration—and thus the ability of households to escape poverty. In that regard, the most significant finding is that the share of older age employment in skilled occupations is between two and four times that of youth employment across the sampled countries (table 6).

In other skills categories, there are greater differences across countries. For example, the shares in semi-skilled occupations are large and similar for youth and older workers in Mali (over 90 percent) and Zambia (around 80 percent), while in Nigeria semi-skilled occupations account for 45.4 percent of older worker employment, compared with 28.5 percent of youth employment. Egypt is an outlier. While more than 80 percent of youth are employed in semi-skilled occupations, only 51 percent of older workers are. Since the proportions of both age groups employed in unskilled occupations is similar, this means that there is a large gap in skilled occupations: these occupations account for 40.3 percent of employed older workers and just 9.7 percent of employed youth. This very low proportion is linked to mismatches between the quality and content of education and the demands of labor markets. As a consequence, the Egyptian labor market has both high vacancy rates and large-scale youth unemployment.²³

Similar disadvantages at the upper end of the skills distribution are evident in other countries: in Mali and Zambia, the share of older worker employment in skilled occupations is more than four times that of employed youth; in South Africa skilled occupations account for 14.2 percent of youth employment compared with 24.1 percent of older worker employment. This gap is unsurprising considering that skilled occupations typically require a post-secondary education or extensive experience, credentials that youth in the labor market typically lack.

Among individual occupations, there are striking differences between youth and older age employment. In Egypt, youth are roughly twice as likely as older workers to be employed in skilled agricultural occupations or in craft and related trades

TABLE 5**Employment by sectors in five African countries, latest year available**

Percent

Economic sector	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Primary	35.0	25.8	70.3	64.6	42.2	38.9	10.3	8.0	65.5	55.6
Agriculture	34.8	25.6	69.6	63.7	42.0	38.5	9.2	5.1	64.4	53.5
Mining	0.2	0.2	0.7	0.9	0.3	0.4	1.1	2.9	1.0	2.1
Industry	32.8	22.3	5.5	5.8	12.0	10.0	22.3	21.1	7.1	9.3
Manufacturing	13.3	10.0	4.1	3.7	10.3	7.6	12.1	10.9	3.4	4.9
Utilities	0.7	2.1	0.0	0.1	0.3	0.3	0.4	0.9	0.3	0.5
Construction	18.8	10.2	1.5	2.0	1.4	2.1	9.8	9.2	3.3	3.9
Services	27.7	47.4	24.2	29.6	32.3	46.9	67.3	70.8	27.2	35.0
Wholesale and retail	12.0	10.9	2.1	2.2	16.1	22.2	27.9	19.1	10.5	14.5
Transport	8.9	10.1	13.3	18.0	5.7	7.3	6.4	5.9	2.3	3.2
Finance	1.8	3.2	1.7	1.5	0.3	1.1	14.1	14.7	3.1	4.6
Community/social/ personal services	5.1	23.2	6.1	3.6	9.0	15.9	14.6	22.7	3.8	9.3
Private households	—	—	1.0	4.3	1.3	0.4	4.3	8.5	7.5	3.4
Other	2.7	3.7	—	—	13.4	4.2	0.1	0.1	0.3	0.2
Unspecified	1.8	0.8	—	—	—	—	—	—	—	—

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Values may not sum to totals because of unspecified responses and rounding.

TABLE 6**Employment across skilled and unskilled occupations in five African countries, latest year available**

Percent

Skill level and occupation	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Skilled	9.7	40.3	1.0	4.4	0.1	0.1	14.2	24.1	2.0	9.1
Managers	2.1	16.2	0.0	0.3	0.0	0.1	2.3	9.5	0.1	1.4
Professionals	4.2	14.5	0.2	1.7	0.0	0.1	3.3	5.7	1.1	5.9
Technicians and associate professionals	3.4	9.6	0.8	2.4	0.0	0.0	8.6	8.9	0.9	1.8
Semi-skilled	81.8	51.0	96.2	94.0	28.5	45.4	53.0	46.7	80.5	80.5
Clerical support workers	2.0	3.2	1.9	2.4	0.0	0.0	16.5	10.3	0.5	0.9
Service and sales workers	10.4	8.0	12.3	17.6	0.3	0.3	17.3	15.1	13.0	17.0
Skilled agriculture, forestry and fishery workers	31.0	15.6	72.1	66.4	28.1	44.9	0.4	0.4	59.7	50.6
Craft and related trades workers	27.7	14.8	9.9	7.4	0.1	0.1	13.1	12.4	5.6	8.3
Plant and machine operators, and assemblers	10.6	9.3	0.0	0.1	0.0	0.1	5.8	8.4	1.6	3.7
Unskilled	7.1	8.3	3.2	1.7	71.5	54.5	30.2	22.7	17.1	10.0
Elementary occupations	7.1	8.3	2.9	1.2	71.5	54.5	30.2	22.7	17.1	10.0
Armed forces occupations	—	—	0.0	0.5	0.0	0.0	—	—	—	—

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

occupations. In Nigeria, unskilled elementary occupations account for about 7 of 10 jobs among youth but just over 5 of 10 jobs among older workers. In South Africa, youth are more likely to be employed in clerical or elementary occupations than their older counterparts, while in Zambia, this is true of skilled agricultural occupations and unskilled elementary occupations. That youth are typically more likely to be employed in skilled agricultural occupations, semi-skilled service and sales occupations, and unskilled elementary occupations is linked to their lower education levels and the increasing share of workers engaging in low-value added or informal services across Africa.²⁴

A concentration of youth employment in lower-skilled occupations is a serious concern if it reflects longer-term constraints on access to more skilled occupations rather than the differing educational profiles of the two groups. From a policy perspective, efforts to improve educational attainment and quality should be sustained. At the same time, obstacles that are keeping young people out of more highly skilled occupations should be identified and addressed. One example is public sector employment, particularly where the public sector dominates formal sector employment. As the average age of public sector employees drifts higher, low rates of turnover limit young people's access to these better-paying, more highly skilled occupations.

TABLE 7
Employment across formal and informal sectors in four African countries, latest year available

Percent

Sector	Egypt (2013)		Mali (2016)		South Africa (2015)		Zambia (2012)	
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Formal sector	36.2	56.1	4.1	10.4	76.5	74.4	10.0	21.8
Informal sector	63.8	43.9	69.5	77.6	19.2	17.1	36.4	47.9
Private households	—	—	26.3	12.0	4.3	8.5	50.8	27.1
Unspecified	—	—	—	—	—	—	2.9	3.1

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Nigeria is excluded from the analysis because its labor force surveys do not include questions about the business registration status of firms.

Employment in the formal and informal sectors

A widely accepted measure of segmentation within the labor market is the size of the informal sector. One problem, however, is the lack of a generally accepted definition of “informal.” Various definitions have been proposed for informal businesses based on the following characteristics:²⁵

- Registration status.
- Number of employees.
- Whether the business operates outside the country's legal or institutional framework.
- Whether the owner would seek alternative or stable employment should these opportunities occur.

Consequently, estimates of the size of the informal sector vary. One estimate puts the size at 50–80 percent of GDP, 60–80 percent of employment, and up to 90 percent of new jobs.²⁶ Of the five countries in the sample, the microdata do not explicitly define the informal sector except in the case of South Africa, and no data are available on business registration in Nigeria. This analysis of the scope of the informal sector uses business registration status to distinguish informal from formal businesses. The results are summarized in table 7.

The data do not reveal any consistent patterns for informal sector employment by age group. What is clear, though, is that the informal sector is an important source of employment in three of the four countries with data. South Africa is the exception, with a relatively small informal sector: less than 20 percent of both youth and older age employment is in the informal sector, a pattern that is consistent with a diversified formal sector and with other findings of low informality in the South African labor market.²⁷ At the other extreme is Mali, where the informal sector accounts for almost 7 of 10 youth jobs and almost 8 of 10 older worker jobs. With an additional 2 in 10 jobs in private households, this means that the formal sector in Mali accounts for just 10.4 percent of older age employment and just 4.1 percent of youth employment. This

represents a significant challenge for the future of job creation in Mali.

In Zambia, youth are less than half as likely as older workers to be employed in the formal sector (10.0 percent compared with 21.8 percent). However, youth are also less likely—by 11.5 percentage points—to be employed in the informal sector. Rather, youth are nearly twice as likely to be employed in private households (50.8 percent compared with 27.1 percent). In Egypt, there is a clear divide between youth and older workers: a majority of youth employment (63.8 percent) is in the informal sector, whereas a majority of older age employment (56.1 percent) is in the formal sector. This distribution is consistent with the patterns observed thus far, which suggest a large labor market disadvantage for Egyptian youth vis-à-vis their older counterparts in accessing better employment opportunities.

Conditions of employment

An examination of the conditions of employment (type and duration of employment contract and social security coverage) suggests, in line with findings presented previously, that employed youth have less secure employment. Compared with older age workers, youth are more likely to have no contract and, when they do have a contract, are substantially less likely to have official or written contracts (table 8). In South Africa, the gap in having a written contract is small: 72.1 percent of employed youth and 81.0 percent of employed older workers. However, in Egypt, Mali, and Zambia, the differences are large. In Zambia, the proportion of youth workers with verbal contracts (66.5 percent) is almost twice that of older workers (35.1 percent). In Egypt, older workers are three times as likely as youth workers to have official/written contracts, and less than half as likely to have no contract.

Job security based on having a full-time regular job is fairly high for both youth and older workers in Egypt and Mali, but not for youth in South Africa and Zambia. However, in all four countries youth are less likely to be in full-time employment

TABLE 8
Conditions of employment in four African countries, latest year available

Percent

Employment condition	Egypt (2013)		Mali (2016)		South Africa (2015)		Zambia (2012)	
	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Type of contract								
Official/written	13.2	39.9	9.4	48.3	72.1	81.0	30.1	63.2
Verbal	—	—	52.4	32.8	27.9	19.0	66.5	35.1
No contract	47.1	22.2	38.3	18.9	—	—	—	—
Unspecified	39.7	37.9	—	—	—	—	3.4	1.7
Duration of contract								
Full-time/regular	52.0	79.5	56.3	71.4	38.9	63.9	55.2	80.4
Part-time/temporary	11.6	4.6	5.5	9.7	23.3	12.5	39.2	17.9
Seasonal/irregular	35.1	15.7	—	—	—	—	3.9	1.0
Unspecified	1.3	0.3	38.3	18.8	37.8	23.5	1.7	0.8
Social security coverage								
Yes	12.8	51.7	1.6	2.4	26.6	50.2	22.0	57.0
No	85.8	48.1	97.9	96.9	69.5	47.9	74.4	40.1
Don't know	1.3	0.3	0.5	0.8	3.9	1.9	3.6	2.9

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: For South Africa, social security coverage refers to respondents who indicated whether their employers contribute to a pension fund on their behalf. Nigeria is excluded from the analysis because their labor force surveys do not include questions on employment conditions for workers.

than their older counterparts. Although having more workers in full-time employment is the ideal, it is concerning that, for youth, this permanent employment is based on verbal agreement or no agreement. This underscores the relative insecurity of their jobs. The situation is worst in Zambia, where two-thirds of working youth have only verbal contracts, and 43.1 percent are employed on temporary, casual, seasonal, or fixed period contracts. Youth's high level of job insecurity is made even more precarious by the absence of formal or verbal employment contracts.

This greater vulnerability of youth employment may extend beyond the labor market as the share of youth workers who report that their employers deduct a social security contribution ranges from a paltry 1.6 percent in Mali to just 26.6 percent in South Africa. In contrast, in three of the four

countries (all but Mali) access among employed older workers is over 50 percent. Furthermore, with the exception of South Africa and Egypt, the other countries have exceptionally low levels of social protection coverage for their population (as indicated in the share of social protection expenditure as a percentage of GDP).²⁸ In Mali, the rate of social security contributions is extremely low for both groups—1.6 percent for employed youth and 2.4 percent for older workers—a finding consistent with the prevalence noted above of the informal sector in that country.

Wages

The earlier characterization of youth as more likely to be employed in low paying sectors or occupations suggests that youth workers earn less than their older counterparts. Ratios of the median²⁹ wages of youth to the median wages of older workers indicate substantially lower median wages for youth than for older workers in all five countries (figure 11). The greatest disparity is in Mali, where the median wage for a 15–24 year old is just 15 percent that of a 25–64 year old. Youth median wages are less than half those of their older counterparts in Nigeria (45 percent) and Zambia (39 percent). The disparity is smallest in Egypt and South Africa: in Egypt, the median youth wage is almost two-thirds (64 percent) the median wage of older

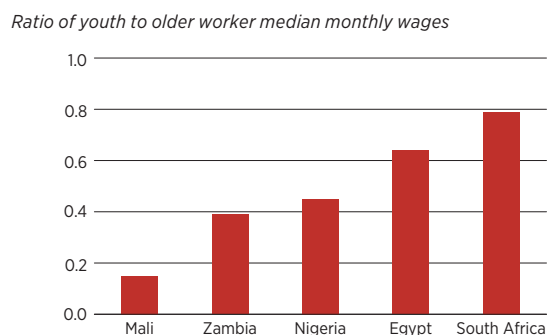
workers and in South Africa it is almost four-fifths (79 percent).

This comparison paints an expected picture of the wage gains that come with age and work experience, a picture that implies that younger workers are expected to earn less than older workers. However, numerous factors influence wages, and the aggregate measure used here obscures these effects. It is quite possible that differences in the composition of the two groups could result in differences in median wages for youth and older workers even if there are no differences in wages between youth and older workers with identical characteristics.

Details on median wages for subgroups of youth and older workers across a number of demographic and employment characteristics can highlight some of these differences. The median wage for each subgroup is expressed as a proportion of the youth group or the older age group median wage. For example, in Egypt the median wage for young men is 5 percentage points higher than the overall youth median wage, while that for young women is 19 percent lower than the youth median wage.

Gender. Across countries and age groups, except for older workers in Mali,³⁰ men's median wages are at least equal to the age-group's median wage, while women's median wages are lower (table 9). At the median, therefore, men earn higher wages than women in both age groups. The magnitude of this gender pay gap differs between the two age groups. For youth, it is highest in Egypt, where the female median wage is 24 percent below the youth median, and it is lowest in South Africa, where the female median wage is just 4 percent lower than the youth median. For older workers, the difference is highest in Nigeria, where the female median wage is 45 percent below the median for older workers, and lowest in Egypt and Zambia, where it is 8 percent lower.³¹ The data therefore suggest that the gap in median wages between male and female workers is narrower for youth. The larger gender gap among older workers could be linked to the

FIGURE 11
Ratio of youth to older worker median monthly wages in five African countries, latest year available



Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

TABLE 9

Ratio of youth to older worker median monthly wages in five African countries, by gender, education level, and urban or rural locale, latest year available

Demographic characteristic	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	Youth ^a	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Gender										
Male	1.05	1.04	0.00	2.50	1.11	1.25	1.00	1.22	1.11	1.03
Female	0.81	0.96	2.67	0.50	0.89	0.65	0.96	0.82	0.98	0.95
Education level										
None	1.00	0.88	1.33	1.00	0.56	0.90	0.65	0.55	0.28	0.65
Primary	1.00	0.92	0.00	1.13	1.11	0.90	0.77	0.61	0.84	0.49
Incomplete secondary	1.00	1.00	0.00	1.14	1.11	0.85	0.83	0.76	0.98	0.65
Complete secondary	1.00	1.12	16.67	4.50	1.44	1.09	1.15	1.22	1.39	1.41
Tertiary	1.06	1.20	^b	8.50	2.20	2.00	2.12	3.64	5.85	1.08
Locale										
Urban	1.00	1.04	4.44	1.50	2.96	0.51	1.00	1.05	1.11	0.65
Rural	1.00	0.96	0.67	1.00	0.67	1.50	0.92	0.79	0.84	0.00
Group median wage (local currency, 1,000s)	1.08	1.68	2.02	13.47	11.35	25.22	2.77	3.50	537.51	1,384.94
National median (local currency, 1,000s)	1.62		9.76		22.70		3.40		1,089.98	
Ratio of group median to national median wage	0.67	1.04	0.21	1.38	0.50	1.11	0.81	1.03	0.49	0.57

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Group and national median wages are in the sampled country's local currency unit in thousands. For example, the median wage in South Africa, shown as 3.40, is 3,400 rand.

a. The median wages for Egyptian youth are fairly similar across characteristics as employers pay this cohort of workers a value that is close to the prescribed minimum wage, resulting in limited income variation.

b. The sample size is too small to make any meaningful inference.

cumulative impact of childbearing and -rearing on older women's labor force participation, employment, and wages.

Educational attainment. Median wages are positively correlated with the level of education. For both youth and older workers, the median wage for workers with a tertiary qualification is higher than the group median wage by a larger margin than for any other educational attainment level (see table 9). Youth and older age wage medians for those with lower levels of education are typically furthest below the age-group medians. As noted earlier, less than 10 percent of employed youth have a degree, implying that the benefits of a higher education accrue to a small proportion of employed youth. In Egypt, educational attainment does not seem to make any difference in the median wage for youth, while in Nigeria, South Africa,

and Zambia the returns to education are substantial, particularly moving from a secondary to a tertiary education: median wages are 97 percentage points higher for South African youth with a tertiary education compared with a secondary education and 450 percentage points higher for Zambian youth. The pattern is similar for older workers with a tertiary education, ranging from an 8 percentage point premium for older workers in Egypt to 400 percentage points in Mali. Zambia is an exception, with a median wage that is almost 70 percentage points higher for workers with a secondary education than for those with a tertiary education. This likely reflects past labor market conditions that so heavily rewarded having a secondary education over having less education that most people did not pursue a higher education. However, this effect appears to be weakening for younger cohorts, among whom tertiary

qualifications are highly valued: the median wage for Zambian youth with tertiary qualifications is roughly twice the median wage for their older counterparts with the same level of education.

Urban and rural locale. While urban areas typically offer more, and more varied, employment opportunities, that pattern is not uniformly reflected in median wages across countries. Overall, wages are higher in urban areas than in the rural areas (see table 9). For urban youth in Mali, the advantage is especially large: the median wage for urban youth is 4.4 times the median for all youth, while the median for rural youth is just 67 percent that for all youth. Among older workers, the urban–rural median wage differential ranges from modest, at 8 percentage points in Egypt, to substantial, at 65 percentage points in Zambia. Living in rural Nigeria is an exception, however, for older workers, whose median wage is almost three times that of their rural counterparts.

Industry. The ratios of the median wage for each subgroup of the youth and older age groups to the median for the group vary widely by industry across countries. In South Africa and Zambia, the median wage ratio for both youth and older workers is highest for those working in mining (table 10). In Egypt, the median wage ratio is highest for youth working in construction and for older workers in mining. In Mali, the median wage for youth employed in mining, construction, and private households is 20 times the youth median wage, while among older workers the highest median wage is earned in the utilities industry. In Nigeria, the highest median wages for both age groups are in the finance industry. On the whole across countries, agriculture and private households offer the lowest median wages.

Occupation. The earlier discussion on occupation indicated that youth were employed predominantly in skilled agricultural, semi-skilled services, and unskilled elementary occupations. Median wages in these occupations vary moderately from the age-group medians across countries except in Mali, which, as indicated earlier, had a small sample.

Sector. Differences by sector of employment are more varied. Egyptian youth working in the informal sector earn 25 percent more than those working in the formal sector. In contrast, the median wage for older workers is 4 percent lower in the informal sector and 4 percent higher in the formal sector than the overall older worker median. For both youth and older workers, the median wage is higher in the informal sector in Mali but in the formal sector in South Africa and Zambia. These patterns are replicated for the public and private sectors. For older workers in Egypt and for both youth and older workers in Mali, South Africa, and Zambia, median wages are higher in the public sector. In Egypt, however, the youth working in the private sector have slightly higher median wages than youth working in the public sector.

Implications of descriptive findings

While more rapid creation of good quality jobs is vital for absorbing the growing numbers of job-seekers entering the labor force each year, the evidence reveals substantial labor market disadvantages for young people compared with older ones. In addition, patterns of disadvantage observed among older workers—such as gender gaps—are replicated among young workers.

Compared with older workers, youth have lower labor force participation rates and higher unemployment rates in all five countries analyzed. Generally, male unemployment is lower than female unemployment. Youth have a lower skill base than older workers and are employed mainly as unskilled or semi-skilled workers; a large share of them ended their education with secondary school. This lower skill base has a direct impact on youth wage levels, as unskilled elementary workers and skilled agricultural workers typically earn median wages that are either below or at the median in each country.

Youth employment is also insecure and vulnerable, as indicated by the high proportion of youth working without a formal contract. Additionally, a large proportion of youth are unpaid

TABLE 10
Ratio of youth to older worker median monthly wages in five African countries, by industry, occupation, and sector, latest year available

Employment characteristic	Egypt (2013)		Mali (2016)		Nigeria (2014)		South Africa (2015)		Zambia (2012)	
	Youth ^a	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth	Youth	Non-youth
Industry										
Agriculture	1.00	0.80	0.00	0.65	0.78	0.75	0.83	0.70	0.72	0.49
Mining	1.13	1.56	20.00	3.30	2.78	1.25	2.12	2.28	3.06	2.70
Manufacturing	1.05	1.02	6.67	1.30	0.78	0.75	1.14	1.18	1.39	1.19
Utilities	1.06	1.28	0.00	5.50	2.00	1.50	1.15	2.28	1.25	1.95
Construction	1.25	1.15	20.00	3.50	1.67	1.50	0.96	0.99	1.11	0.70
Wholesale and retail	0.94	0.80	3.33	1.50	1.11	0.80	1.04	0.92	0.97	0.65
Trade	1.19	1.12	4.67	1.75	1.17	1.00	1.17	1.37	1.39	0.81
Finance	1.06	1.20	13.33	3.00	3.89	2.75	1.35	1.37	1.39	0.86
Community/social/personal services	0.88	1.04	5.00	2.50	2.00	2.00	0.96	1.52	1.05	2.16
Private households	—	—	20.00	4.50	0.67	0.60	0.50	0.46	0.84	0.43
Other	1.00	0.72	—	—	—	—	4.62	5.77	13.93	1.30
Not stated	1.11	1.20	—	—	—	—	—	—	—	—
Occupation										
Service workers	1.00	0.80	6.67	1.50	1.22	1.20	1.08	0.92	0.97	0.65
Skilled agriculture	1.00	0.76	0.00	0.75	1.22	0.90	0.65	0.76	0.33	0.54
Elementary occupations	1.00	0.72	6.67	2.00	0.89	1.00	0.81	0.67	0.97	0.54
Sector										
Formal	1.00	1.04	0.83	1.00	—	—	1.08	1.22	1.39	0.97
Informal	1.25	0.96	3.33	3.50	—	—	0.75	0.73	0.70	0.49
Public	0.98	1.08	56.67	7.50	—	—	1.15	1.88	2.48	2.32
Private	1.00	0.96	1.00	1.00	—	—	1.00	0.92	1.11	0.76
Private household	0.94	0.96	1.00	0.50	—	—	1.15	0.92	—	—
Group median wage (local currency, 1,000s)	1.08	1.68	2.02	13.47	11.35	25.22	2.77	3.50	537.51	1,384.94
National median (local currency, 1,000s)	1.62		9.76		22.70		3.40		1,089.98	
Ratio of group median to national median wage	0.67	1.04	0.21	1.38	0.50	1.11	0.81	1.03	0.49	0.57

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey; 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Group and national median wages are in the sampled country's local currency unit in thousands. For example, the median wage in South Africa, shown as 3.40, is 3,400 rand.

a. The median wages for Egyptian youth are fairly similar across characteristics as employers pay this cohort of workers a value that is close to the prescribed minimum wage, resulting in limited income variation.

family workers, self-employed, or working in the informal sector—all low-wage segments of employment. Large numbers of both youth and older workers are engaged in vulnerable employment. Not only does this imply low levels of protections and potentially dangerous working conditions, but it also suggests low wages. Policy should aim to improve the quality of jobs, while taking care not to slow job creation. Similarly, support for

enterprises in transitioning to higher productivity activities may boost wage levels and reduce poverty and inequality.

A majority of youth are employed in low-paying occupations and sectors and often under precarious working conditions where few, if any, make pension contributions, which further limits upward mobility. And although youth earn less than

older workers at the median, unconditional estimates indicate that higher-earning youth are likely to be male, hold a post-secondary qualification, live in urban areas, and work in the services sector. This implies that the apparent wage premium earned by this subset of employed youth accrues only to a small proportion of them, as only a minority of youth within the labor market have these characteristics. The advantages conferred by a post-secondary education reinforce the need for a renewed policy focus on improving education access and quality. Linked to this is the need to ensure proper articulation within national education systems to allow individuals to move smoothly from one part of the education system to another. Additionally, curricula must be responsive to the needs of employers, and young people need adequate information about labor market conditions and demand for skills when making education choices.

Multivariate analysis of labor market participation, employment, and earnings

While the results of the descriptive analysis presented above are informative, that analysis cannot take into account numerous factors that affect the labor market outcomes of young people. This constraint is addressed by investigating employment in a multivariate model that is consistent across all five countries (Egypt, Mali, Nigeria, South Africa, and Zambia). The model deals with the sequential stages in the labor market: labor market participation and then employment. It is important to include both labor market participation and employment equations in the analysis because of the high levels of involuntary unemployment in many developing countries, including those in Africa.³²

It is widely acknowledged that a sample of labor market participants is highly unlikely to be a random sample of the working age population. The group of potential labor market participants has already undergone a selection process based on deciding whether to enter the labor market. The participation equation, therefore, attempts to shed some light on the factors affecting the decision to

enter the labor force. The model begins with a full sample of potential labor market participants (the working age population) and estimates a participation probit regression using, among other variables, a number of individual controls that affect the decision to enter the labor market. After the participants are determined, an employment probit model is estimated, conditional on labor force participation.³³

Model estimates

Age. Although there are a number of individual- and household-level controls in the two estimations, the focus is on the age dummy variables. In particular, how, after controlling for other factors, does being young affect labor market participation, and then how, conditional on participation, does being young affect finding employment? These estimates take a broader view of youth, including those ages 25–34 as well as those ages 15–24. This expanded view is based on the observation noted in the discussion of population trends that the 25–34 year old cohort will account for a large share of population growth and working age population growth in African countries over 2013–63. In addition, the middle-age group, ages 35–44, is the base category in the estimations.

Overall, even after controlling for education and other individual characteristics, youth in all five countries have a lower propensity to participate in the labor market than do people in the middle-age base category (table 11). The effect is felt more strongly among the younger youth cohort (ages 15–24), whose propensity to participate ranges from 10.5 percent lower than for the base category in Mali to 52.9 percent lower in both Nigeria and South Africa. Youth also have a lower likelihood of being employed relative to the middle-age base category. The negative estimates are largest for the youngest cohort, which suggests that these youth are the least likely to be employed even after controlling for selection into the labor market and other observable factors such as education. The estimated coefficient for this cohort ranges from 22 percent lower than the base category in Mali to 32 percent lower in Egypt.³⁴

TABLE 11

Determinants of labor market participation and employment in five Africa countries, 2013–63

Variable	Egypt		Mali		Nigeria		South Africa		Zambia	
	Participation	Employment	Participation	Employment	Participation	Employment	Participation	Employment	Participation	Employment
15–24 years	-0.344*** (0.004)	-0.317*** (0.007)	-0.105*** (0.013)	-0.222*** (0.020)	-0.529*** (0.006)	-0.021*** 0.006	-0.529*** (0.007)	-0.056** (0.029)	-0.474*** (0.010)	-0.032** (0.016)
25–34 years	-0.003 (0.004)	-0.075*** (0.003)	-0.034*** (0.012)	-0.035*** (0.008)	-0.143*** (0.007)	-0.014*** 0.002	-0.075*** (0.009)	-0.083*** (0.008)	-0.104*** (0.012)	-0.024*** (0.006)
45–54 years	-0.023*** (0.004)	0.033*** (0.003)	0.010 (0.014)	0.021*** (0.006)	0.049*** (0.008)	0.005*** 0.001	-0.054*** (0.010)	0.063*** (0.009)	-0.039*** (0.016)	0.009 (0.007)
55–65 years	-0.330*** (0.004)	0.069*** (0.003)	-0.193*** (0.018)	0.028*** (0.005)	0.021** (0.010)	0.006*** 0.001	-0.312*** (0.011)	0.189*** (0.011)	-0.147*** (0.020)	0.024*** (0.006)
Male	0.652*** (0.002)	0.174*** (0.009)	0.320*** (0.007)	-0.020** (0.010)	0.141 (0.004)	-0.003*** 0.001	0.154*** (0.006)	-0.010 (0.009)	0.147*** (0.007)	-0.009* (0.005)
Urban	-0.053*** (0.003)	-0.023*** (0.002)	-0.090*** (0.010)	-0.003 (0.005)	-0.055*** (0.006)	-0.004*** 0.001	0.086*** (0.007)	0.006 (0.009)	-0.147*** (0.008)	-0.046*** (0.006)
Primary	-0.294*** (0.004)	-0.035*** (0.005)	0.007 (0.012)	-0.019*** (0.006)	0.018*** (0.007)	-0.002 0.001	0.009*** (0.003)	-0.014*** (0.004)	-0.075*** (0.013)	0.012* (0.006)
Secondary	0.059*** (0.003)	-0.062*** (0.003)	—	—	—	—	0.021*** (0.002)	-0.012*** (0.003)	-0.134*** (0.014)	0.012* (0.006)
Junior secondary	—	—	-0.054** (0.024)	-0.092*** (0.019)	-0.257*** (0.011)	0.000 0.002	—	—	—	—
Senior secondary	—	—	-0.291*** (0.017)	0.008 (0.008)	-0.107*** (0.007)	-0.010*** 0.002	—	—	—	—
Complete secondary	—	—	—	—	—	—	0.116*** (0.008)	0.036*** (0.009)	0.079*** (0.015)	-0.049*** (0.011)
Complete secondary plus certification/diploma	—	—	—	—	—	—	0.145*** (0.012)	0.029** (0.012)	0.119*** (0.020)	0.013 (0.008)
Post-secondary certification/diploma	0.203*** (0.007)	-0.049*** (0.006)	—	—	-0.149*** (0.011)	-0.049*** 0.007	—	—	—	—
Degree	0.354*** (0.004)	-0.077*** (0.005)	0.118** (0.040)	-0.296*** (0.041)	-0.212*** (0.012)	-0.078*** 0.011	0.020*** (0.008)	0.037*** (0.007)	0.095* (0.052)	0.031 (0.008)
Number of children ages 0–14 in household	-0.004*** (0.001)	—	-0.001 (0.001)	—	-0.017*** (0.001)	—	-0.017*** (0.002)	—	-0.013*** (0.002)	—
Number of elderly ages 60+ in household	-0.038*** (0.003)	—	-0.021*** (0.005)	—	-0.098*** (0.004)	—	-0.093*** (0.005)	—	-0.057*** (0.007)	—
Lambda	—	0.046*** (0.005)	—	-0.070*** (0.020)	—	-0.012*** (0.002)	—	-0.289*** (0.032)	—	-0.097*** (0.018)
Number of observations	221,735	11,2677	20,719	14,355	78,827	54,201	43,191	25,368	30,823	20,710
Chi-squared	65,864.430	11,639.270	2,756.060	1,322.270	14,629.210	2,320.160	9,335.610	2,281.200	5,280.250	1,469.580
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R-squared	0.380	0.218	0.190	0.347	0.278	0.351	0.253	0.119	0.222	0.221
Observed probability	0.510	0.869	0.704	0.904	0.708	0.957	0.602	0.723	0.671	0.916
Predicted probability (at x-bar)	0.523	0.923	0.749	0.969	0.769	0.995	0.632	0.754	0.716	0.957

*** $p \leq 0.01$; ** $p \leq 0.05$; * $p \leq 0.1$.

Source: Calculations based on data from 2013 Egypt Labor Force Survey (LFS); 2016 Mali LFS; 2014 Nigeria Quarterly Labor Force Survey (QLFS); 2015 South African Labor Market Dynamics; and 2012 Zambia LFS.

Note: Reported values are marginal effects. The data are weighted. Numbers in parentheses are standard errors. In general, the omitted categories are for women, ages 35–44, and no education. In the case of South Africa, black South Africans are included as an omitted category. Province dummy variables are included in estimations across all countries. Race dummy variables are included in the South African estimations.

Gender. Relative to women, men have a higher likelihood of participation in the labor market across the five African countries (although, this is not statistically significant in the case of Nigeria). The gender effect is felt strongest in Egypt, where the men are 65 percent more likely to participate

in the labor market than women, and Mali, where they are 32 percent more likely. The magnitude of the gender effect is less pronounced in South Africa (15.4 percent) and Zambia (14.7 percent). The employment estimates show a different gender pattern. Contingent on participation, men have a

higher likelihood of being employed (17.4 percent) than women in Egypt, and a lower likelihood of being employed in Zambia (0.9 percent), Nigeria (0.3 percent), Mali (2.0 percent), and South Africa (10 percent), though in South Africa the difference is not statistically significant.

Urban or rural locale. Being located in an urban rather than a rural area lowers the probability of labor market participation in Zambia (14.7 percent), Mali (9.0 percent), Nigeria (5.5 percent), and Egypt (5.3 percent) while raising the probability of participation in South Africa (8.6 percent). Similarly, labor force participants are less likely to be employed if they reside in an urban area in Zambia (4.6 percent), Egypt (2.3 percent), Nigeria (0.4 percent), or Mali (0.3 percent), though in Mali the difference is not statistically significant. Thus, being located in a rural area is associated with increased participation and better chances of employment in all the sample African countries except South Africa. This may be because subsistence agriculture and related informal work in rural areas constitute a large share of employment in these four African countries, whereas employment in South Africa is typically concentrated in urban centers.

Education. While higher levels of education are typically expected to be associated with an increased propensity to join the labor force, results diverge across the five African countries, suggesting that education informs the choice to join the labor force differently across these countries. The pattern is clear in South Africa: relative to individuals with no schooling, individuals with higher levels of education are more likely to enter the labor force. The propensity to enter the labor force increases for higher levels of education, so that individuals with a complete secondary education plus a certificate/diploma are the most likely to enter the labor force (14.5 percent more likely than those with no schooling). The propensity to enter the labor force tapers off for individuals with a degree, who are only 2 percent more likely to enter the labor force than individuals with no schooling. These findings are linked to the fact that there

are few adults with no education in South Africa, and they tend to be older and employed in agriculture or private households. A similar pattern is evident in Egypt and Zambia, at least for individuals with a complete secondary education or more. However, individuals with a primary education (in Egypt) or a primary and incomplete secondary education (in Zambia) are less likely to participate in the labor market than their counterparts with no schooling.

In Mali, individuals with a secondary education are less likely than individuals with no schooling to participate in the labor market, but individuals with a degree are more likely to participate. In Nigeria, individuals with a secondary or tertiary education are also less likely than individuals with no schooling to participate in the labor market: 25.7 percent less likely for junior secondary, 10.7 percent for senior secondary, 14.9 percent for post-secondary, and 21.2 percent for a degree. It may be that more highly educated individuals have more options for support, for example, from their similarly educated family members; in this way, nonparticipation may be thought of as a “luxury” available only to better educated, and therefore generally wealthier, individuals.

Higher levels of education are typically associated with better employment outcomes. However, the marginal effects for the education variables differ across the five countries, suggesting that education has differential effects on the likelihood of being employed, conditional on labor market participation. In Egypt, Mali, and Nigeria, having any education is associated with a lower propensity for employment than having no schooling. For example, relative to someone with no schooling, someone with a degree is 29.6 percent less likely to be employed in Mali, 7.8 percent less likely in Nigeria, and 7.7 percent less likely in Egypt. One possible reason is that most employment opportunities in these three countries are in sectors and economic activities that are not skills-intensive, such as the informal sector and subsistence agriculture.

The estimates for South Africa behave as expected, with higher levels of education being associated with higher propensities for employment. Employment propensity is higher for completion of secondary education or higher; having a primary education or incomplete secondary education lowers the probability of employment.

The employment estimates for Zambia position it somewhere between South Africa and the other three African countries. Having a primary or incomplete secondary education increases the probability of employment, while having a complete secondary education lowers the probability. The estimates for having a tertiary education are not statistically significant, suggesting that having a tertiary education, relative to no schooling, does not influence employment propensity in Zambia.

Implications of the multivariate analysis

The estimates for effects of age suggest that African labor markets are not youth friendly. Consistently across the five countries, youth are less likely to enter the labor market and, once in the labor market, are less likely to get a job. These findings are particularly concerning in light of the predicted expansion in the share of youth in the working age population in Africa.

A further concern is the need for these economies to structurally transform, moving from low-productivity activities, particularly in agriculture, to high-productivity activities, such as manufacturing (although this is perhaps less relevant for South Africa). Growth in high-productivity formal sector activities outside the public sector would drive employment growth, especially for the rising numbers of youth. But high-productivity activities require skilled workers, whereas education levels are low in these countries, suggesting supply-side constraints in the labor market. In addition, higher levels of education are not associated with increased propensity to enter the labor market and find employment, suggesting either no demand for these skills or reservation wages among skilled individuals that are higher than local labor market conditions can support.

Labor market implications of demographic change

Demographic change brings challenges to the economy, particularly the labor market. In countries where population growth is concentrated among younger cohorts, there is added pressure to create jobs. In countries where the population is aging, economies may struggle to find workers, with important implications for economic growth and, often, fiscal sustainability. National populations in Africa are generally young, and working age populations will be experiencing rapid growth for the next several decades. At the same time, African labor markets are experiencing serious challenges. This section brings these two threads together to quantify the job creation imperative that countries face over the next half-century.

While it is impossible to predict with confidence employment trends decades into the future, it is worth exploring the magnitude of the labor market challenge created by demographic change. Recent modeled International Labour Organization average estimates of labor force participation and unemployment rates (2012–16 averages) are used to project the size of the labor force and the unemployment rate.³⁵ These projections can be used to estimate future employment levels that will keep unemployment rates constant, given unchanged labor force participation rates.

For the continent as a whole, the labor force is expected to grow by 1.0 billion between 2016 and 2063 (table 12). Keeping participation and unemployment rates constant would require that employment grow by 948.1 million jobs over the period, or more than double (217.6 percent) the employment level in 2016—a tripling of employment in less than half a century. That means adding an average of almost 1.7 million jobs a month across the continent. In Sub-Saharan Africa alone, the required expansion is equivalent to 237.2 percent of employment in 2016 and an additional 1.6 million jobs a month over 2016–63.

TABLE 12**Expected demographic change and the labor market in Africa, by region, 2016–63**

Region	Period	Change				Labor force growth Average annual (%)	Required jobs per month (1,000s)
		Labor force Number	Unemployed Number	Employed Number	Share of 2016 (%)		
North Africa	2016–63	54.9	6.7	48.2	85.4	1.3	85
	2016–23	8.1	1.0	7.1	12.6	1.7	59
	2023–33	14.7	1.8	12.9	22.8	1.9	107
	2033–43	12.2	1.5	10.7	19.0	1.3	89
	2043–53	10.4	1.3	9.1	16.2	1.0	76
	2053–63	9.5	1.2	8.3	14.8	0.8	70
East Africa	2016–63	325.6	17.0	308.6	232.4	2.6	547
	2016–23	36.1	2.0	34.1	25.7	3.3	284
	2023–33	61.0	3.3	57.7	43.4	3.0	481
	2033–43	70.5	3.7	66.8	50.3	2.6	556
	2043–53	77.6	4.0	73.6	55.4	2.3	613
	2053–63	80.5	4.0	76.5	57.6	1.9	638
Central Africa	2016–63	172.1	6.8	165.3	270.6	2.8	293
	2016–23	16.4	0.6	15.7	25.7	3.3	131
	2023–33	29.9	1.2	28.8	47.1	3.2	240
	2033–43	36.7	1.5	35.3	57.7	2.9	294
	2043–53	42.7	1.7	41.0	67.1	2.6	342
	2053–63	46.4	1.8	44.5	72.9	2.2	371
Southern Africa	2016–63	141.0	18.2	122.9	206.2	2.4	218
	2016–23	14.8	2.0	12.8	21.4	2.8	106
	2023–33	25.6	3.4	22.2	37.3	2.7	185
	2033–43	30.0	3.9	26.1	43.8	2.5	217
	2043–53	34.0	4.3	29.7	49.8	2.2	247
	2053–63	36.7	4.6	32.1	54.0	2.0	268
West Africa	2016–63	321.6	18.4	303.2	240.8	2.6	538
	2016–23	30.7	1.8	28.9	23.0	3.0	241
	2023–33	55.9	3.2	52.7	41.8	3.0	439
	2033–43	67.8	3.9	63.9	50.7	2.7	532
	2043–53	79.3	4.5	74.8	59.4	2.5	623
	2053–63	87.9	5.0	82.9	65.9	2.2	691
Africa	2016–63	1,015.3	67.1	948.1	217.6	2.5	1,681
	2016–23	106.1	7.5	98.6	22.6	3.0	822
	2023–33	187.2	12.9	174.2	40.0	2.9	1,452
	2033–43	217.1	14.4	202.7	46.5	2.5	1,689
	2043–53	244.0	15.8	228.2	52.4	2.3	1,902
	2053–63	261.0	16.5	244.5	56.1	2.0	2,037
Sub-Saharan Africa	2016–63	960.4	60.5	899.9	237.2	2.6	1,596
	2016–23	98.0	6.5	91.5	24.1	3.1	762
	2023–33	172.5	11.2	161.3	42.5	3.0	1,344
	2033–43	204.9	13.0	192.0	50.6	2.7	1,600
	2043–53	233.6	14.5	219.1	57.7	2.4	1,826
	2053–63	251.5	15.4	236.1	62.2	2.1	1,968

Source: Calculations based on medium variant projections (UN 2017).

The employment expansion needed varies across African regions and over time. The largest absolute expansion in the labor force over the period is projected for East Africa (325.6 million people) and West Africa (321.6 million), with smaller expansion in Central Africa (172.1 million), Southern Africa (141.0 million), and North Africa (54.9 million). The fastest annual rate of labor force growth is projected for Central Africa (2.8 percent) and the slowest for North Africa (1.3 percent). The required expansion of employment over 2016 levels is also smallest in North Africa (85.4 percent); for the other regions, estimates range from 206.2 percent in Southern Africa to 270.6 percent in Central Africa.

Assuming constant labor force participation rates, keeping unemployment rates constant would require creating approximately 547,000 jobs monthly in East Africa and 538,000 in West Africa between 2016 and 2063. These two regions would each account for roughly one-third of the required monthly job creation in Africa. Central Africa would require 293,000 new jobs each month and Southern Africa, 218,000 jobs. All of these estimates indicate clearly the need to rapidly accelerate job creation in the four Sub-Saharan African regions. In East Africa, the monthly requirement rises from 284,000 jobs over 2016–23 to 481,000 jobs over 2023–33. Similarly, in the other three regions, there is an almost doubling of the monthly jobs requirement in 2023–33 compared with 2016–23, and the requirement increases in each 10-year period thereafter. Thus, by the decade 2053–63, West African countries will need to be adding close to 700,000 jobs a month, followed by East African countries at almost 640,000 jobs a month. Even in Southern Africa, the required number of jobs will rise to almost 270,000 a month.

While the estimates in table 12 are derived using strict assumptions of constant rates of labor force participation and unemployment, they are nonetheless instructive. If labor force participation rates were to fall instead, so would the required number of new jobs. However, this would shift pressure to upgrade the quality of jobs. Specifically, lower


participation rates would require higher wages to maintain the level of aggregate wage income implied in the estimates. If labor force participation rates were to rise, even more rapid job creation would be required to keep unemployment rates constant. Allowing unemployment rates to rise over time would reduce the required rate of job creation but would also require higher wages to maintain the level of aggregate wage income. If aggregate wage income were to fall, this would result in lower living standards and possibly lower investment in human capital (unless the shortfall in resources is made up from other sources).

POLICY RECOMMENDATIONS

Africa is undergoing rapid change: economies are growing and integrating, societies are urbanizing, and technologies are advancing. Demographic change is unprecedented in scale and pace. The continent's working age population is projected to more than triple between 2013 and 2063, accounting for 81.4 percent of the global increase—more than four times that of Asia. However, African economies have been unable to keep up with the need for job creation, which has lagged behind economic growth. At least part of the blame lies in the fact that the type of growth that the commodities boom underpinned was not labor-absorbing.

Central Africa's working age population is projected to grow almost 300 percent between 2013 and 2063, followed by West Africa and East Africa. North Africa will see a much smaller increase of around two-thirds. Broadly speaking, the expected rate of growth in the working age population is negatively correlated with current incomes, with some exceptions. This means that, in general, poorer countries will see more rapid rates of growth in the working age population over the period.

Just five countries will be responsible for almost half of the growth in the working age population over the 50-year period. Nigeria alone is expected to account for 17.7 percent of the expansion, with Democratic Republic of Congo,



Ethiopia, Tanzania, and Uganda each accounting for 5–10 percent. The next tier of countries includes Angola, Egypt, Kenya, and Niger.

Three things are clear from the analysis of population trends. First, population growth is expected to be driven primarily by child and youth cohorts between 2013 and 2033. After 2033, older age cohorts are expected to account for greater shares of population growth, with strong growth projected for those ages 55–64 and 65 and older over 2043–63. Second, although the composition of the working age population becomes older over time, the two youngest cohorts (ages 15–24 and 25–35) are still expected to constitute at least half of the working age population in 2063. This suggests that policies focusing on youth—especially employment opportunities—should remain a key priority. Third, the aging of the population from 2030 onward means that policymakers should also focus on key issues affecting older workers. Countries should use this lead time to set up robust, sustainable systems for elderly support (pension systems, social care provision) before they are required by large proportions of the population.

As the working age population grows, dependency ratios should fall. Africa will go from having the highest average total dependency ratio in the world in 2013 to having the lowest by 2063. This pattern is due to the substantial decline in the child dependency ratio over the period, particularly from the mid-2020s onward. While other world regions see rapid increases in the elderly dependency ratio over the period, Africa will see a much more muted increase that does not really begin until the late 2030s.

What this means is that at some point during 2013–63, most African countries will see an opening of the demographic window of opportunity—during which children under 15 years account for under 30 percent of the population and people 65 and older account for less than 15 percent. This window has already opened in some countries, notably in North Africa, whereas in others, particularly in West and Central Africa, it is not projected to open until after 2063. The window of

opportunity presents an important but transitory opportunity for governments and societies. At this time, the working age population is at its peak as a share of the total population, potentially lifting living standards and enabling greater investment, particularly in human capital.

A similar story, although with somewhat different timing, emerges from the analysis of the first demographic dividend using estimates for a number of African countries in four regions (there are insufficient data for North Africa). Southern Africa has already passed through a large part of its first demographic dividend, while East Africa is likely to experience the peak dividend between 2018 and 2030. Central and West Africa, further behind, are expected to see their first demographic dividend peak in the late 2030s and 2040s.

But the analysis also reveals that all four regions are likely already experiencing the beginning of the first demographic dividend, with North Africa even further ahead. Thus, countries need to establish policy environments to harness the benefits of the first demographic dividend and prepare for the second. However, there appears to be considerable variation across countries in the timing and magnitude of the first demographic dividend, as implied by differences in population trends and age-related patterns of labor income and consumption. This points to the need for more national analyses of the impact of aging on the macroeconomy. Finally, the projected demographic dividends are calculated on the basis of static profiles of labor income and consumption. Changes in these profiles over time may accentuate or mute the impact of the demographic dividend, indicating that specific improvements in employment and other labor market outcomes could have a significant effect on countries' ability to harness the dividend.

The analysis of labor market participation, employment, and unemployment in five countries—Egypt, Mali, Nigeria, South Africa, and Zambia—revealed low youth labor force participation rates and high unemployment rates relative to rates for older workers. Generally, women experience

higher rates of unemployment than men. Employed youth typically have fewer skills, with large proportions having a completed secondary education as their highest qualification. As a result, the majority of youth are employed as unskilled or semi-skilled workers. This has a direct impact on youth wages, and so on their ability to provide for families and invest in human capital. Youth employment is also more likely than older age employment to be insecure and vulnerable: few employed youth have formal contracts, while a large proportion are unpaid family workers or work in the informal sector. And fewer youth than older workers report that their employers make social security contributions on their behalf.

These patterns are confirmed in the multivariate analysis of participation and employment in five African countries with the necessary data. The estimates suggest that African labor markets are not youth-friendly: in each country, youth are less likely than older workers to enter the labor market and, when they do, are less likely to find employment. This is a particularly concerning finding in the context of rapidly growing youth populations in many African countries.

It is clear that structural transformation away from low-productivity economic activities, particularly in agriculture, toward high-productivity activities, such as manufacturing, is a key priority for Africa. Growth in high-productivity formal sector activities outside the public sector would drive employment growth, especially for the growing number of youth in these countries. However, high-productivity economic activities require skilled workers, and these are lacking in many countries. Sub-Saharan Africa is projected to remain the least educated geographic region in the world in 2035, although there will be some convergence with the global average.³⁶

Current labor market conditions suggest that Africa faces an immense jobs challenge over 2016–63. Assuming constant labor force participation rates, African countries will collectively need to create 1.7 million jobs a month over the period

to keep unemployment rates constant. Critically, the jobs needed will rise over time, from 1.5 million a month in 2023–33 to 2.0 million a month in 2053–63. Regionally, there is substantial variation. In North Africa, employment will need to grow 1.3 percent a year over the period 2016–63 to keep unemployment constant, equivalent to 85,000 jobs a month. Employment will need to grow much faster, at 2.8 percent a year, in Central Africa, at 293,000 jobs a month, and 2.6 percent a year in East Africa, at 547,000 jobs a month, and West Africa, at 538,000 jobs a month.

The policy imperative is clear. African governments must immediately begin to implement effective policies to create a conducive social and economic context for more rapid growth. This includes policies ranging from investments in efficient education and health systems and physical infrastructure to good governance and prudent macroeconomic measures. Growth paths need to be appropriate to their context. Countries cannot afford to promote capital-intensive modes of production at the expense of more labor-intensive industries that can deliver urgently needed jobs, as that will lead to stagnating rates of poverty and will exacerbate inequality. While the youth boom may represent a unique opportunity to advance living standards and welfare across the continent, without appropriate and well-timed policy-making, it is likely to result in social instability that can set back social and economic progress.

NOTES

1. Unless otherwise stated, the population projections used are the UN (2017) medium variant projections. Details regarding the methodology and underlying assumptions can be found in UN (2017). The medium-fertility variant represents the median trajectory of future fertility levels as estimated by the Population Division (UN 2017 p. 11). On either side of the medium-fertility variant, the high-fertility and low-fertility variants are projections that assume essentially that future fertility is 0.5 births higher and 0.5 births lower than the medium-fertility variant (UN 2017 p. 16).

2. Vallin 2007.
3. Mason and Lee 2011.
4. Mason and Lee 2007.
5. Oosthuizen 2013; Oosthuizen 2015.
6. Geungant 2017.
7. AfDB, OECD, UNDP, and UNECA 2012.
8. Fox and Kaul 2017.
9. The ILO (2017) classifies as vulnerable employment own-account workers and contributing family workers since they have “a lower likelihood of having formal work arrangements, and are therefore more likely to lack elements associated with decent employment, such as adequate social security and a voice at work”; non-vulnerable employment consists of wage and salaried workers and employers.
10. Fox and Kaul 2017; AfDB, OECD, UNDP, and UNECA 2012; World Bank 2012.
11. Fox and Kaul 2017.
12. AfDB, OECD, UNDP, and UNECA 2012.
13. Vanek et al. 2014.
14. ILO 2015.
15. AfDB, OECD, UNDP, and UNECA 2012.
16. Fox and Kaul 2017.
17. AfDB, OECD, UNDP, and UNECA 2012.
18. AfDB, OECD, UNDP, and UNECA 2012.
19. AfDB, OECD, UNDP, and UNECA 2012.
20. Fox and Kaul 2017.
21. World Bank 2017.
22. Bhorat, Cassim, and Yu 2015.
23. AfDB, OECD, UNDP, and UNECA 2012.
24. Bhorat et al. 2016.
25. Fields 2011; Benjamin and Mbaye 2012; Oosthuizen et al. 2016.
26. Benjamin and Mbaye 2014.
27. Global Entrepreneurship Research Association 2017.
28. Bhorat et al. 2017.
29. The median—the middle value of the distribution—is preferred over the average because the distribution of wage data is likely to be skewed and have outliers; because of the sensitivity of the mean to outliers, using it may give a false impression of the typical wage.
30. The small size of the Malian sample reporting non-zero wages is a cause of unconventional results, which means most of the statistics should be interpreted with caution.
31. This gender wage gap is also observed for mean incomes (not shown here).
32. Bhorat and Leibbrandt 2001.
33. Across all five estimations, lambda is statistically significant. This indicates that sample selection bias exists and there is a need to run the employment probit using a two-step Heckprobit approach.
34. In fact, this may point to one of the underlying causes of the Arab Spring, where youth felt disenchanting with the lack of employment opportunities available to them.
35. World Bank 2017.
36. Eberstadt 2017.

REFERENCES

- AfDB (African Development Bank), OECD (Organization for Economic Co-operation and Development), UNDP (United Nations Development Programme), and UNECA (United Nations Economic Commission for Africa). 2012. *African Economic Outlook 2012: Promoting Youth Employment*. Paris, France: OECD Publishing.
- Benjamin, N., and A.A. Mbaye. 2012. *The Informal Sector in Francophone Africa: Firm size, Productivity, and Institutions*. Washington, DC: World Bank.
- . 2014. “Informality, Growth, and Development in Africa.” WIDER Working Paper 2014/052, Helsinki, Finland.
- Bhorat, H., and M. Leibbrandt. 2001. “Modelling Vulnerability and Low Earnings in the South African Labour Market.” In *Fighting Poverty Labour Markets and Inequality in South Africa*, ed. H. Bhorat, M. Leibbrandt, M. Maziya, S. van der Berb, and I. Woolard. Cape Town, South Africa: University of Cape Town Press.
- Bhorat, H., A. Cassim, and D. Yu. 2015. “Temporary Employment Services in South Africa: Assessing the Industry’s Economic Contribution.” Mimeograph. Cape Town, South Africa: University of Cape Town Development Policy Research Unit.
- Bhorat, H., F. Steenkamp, C. Rooney, N. Kachingwe, and A. Lees. 2016. “Understanding and Characterising the Services Sector in South Africa: An Overview.” WIDER Working Paper 2016/157, Helsinki, Finland.

- Bhorat, H., A. Cassim, A. Ewinyu, and F. Steenkamp. 2017. "Social Protection and Inequality in Africa: Exploring the Interactions." In *Income Inequality in Sub-Saharan Africa: Divergence, Determinants and Consequences*, ed. UNDP. New York, NY.
- Central Agency for Public Mobilization & Statistics, Egypt. 2016. *Egypt Labor Force Survey 2016*. Dataset.
- Central Statistical Office, Ministry of Finance, Government Republic of Zambia. 2013. *Labour Force Survey 2012*. Lusaka, Zambia. Dataset.
- Eberstadt, N. 2017. "Manpower, Education, Skills and Jobs in Sub-Saharan Africa: Past Trends and Future Outlook." In *Africa's Population: In Search of a Demographic Dividend*, ed. H. Groth and J.F. May. Basel, Switzerland: Springer.
- Fields, G. 2011. *Informality: It's Time to Stop Being Alice-in-Wonderland-ish*. Cambridge, MA: WIEGO.
- Fox, L., and U. Kaul. 2017. *The Evidence Is In: How Should Youth Employment Programs in Low-Income Countries Be Designed?* Washington, DC: USAID.
- Guengant, J.-P. 2017. "Africa's Population: History, Current Status, and Projections." In *Africa's Population: In Search of a Demographic Dividend*, ed. H. Groth and J.F. May. Basel, Switzerland: Springer.
- Global Entrepreneurship Research Association. 2017. *Global Entrepreneurship Monitor Global Report 2016/17*. London, UK: London Business School.
- ILO (International Labour Organization). 2015. *Five Facts about Informal Economy in Africa*. Geneva, Switzerland.
- . 2017. *World Employment and Social Outlook Data Finder*. Geneva, Switzerland.
- Lee, R., and A. Mason. 2011. *Population Aging and the Generational Economy: A Global Perspective*. Cheltenham, UK: Edward Elgar. Data available at: <http://www.ntaccounts.org/>. Accessed: 23 August 2017.
- Mason, A., and R. Lee. 2007. "Transfers, Capital, and Consumption over the Demographic Transition." In *Population Aging, Intergenerational Transfers and the Macroeconomy*, ed. R.L. Clark, N. Ogawa, and A. Mason. Cheltenham, UK: Edward Elgar.
- . 2011. "Population Aging and the Generational Economy: Key Findings." In *Population Aging and the Generational Economy*, ed. R. Lee and A. Mason. Cheltenham, UK: Edward Elgar.
- Oosthuizen, M.J. 2013. "Maximising South Africa's Demographic Dividend." DPRU Working Paper No. 13/157. University of Cape Town Development Policy Research Unit, Cape Town, South Africa.
- . 2015. "Bonus or Mirage? South Africa's Demographic Dividend." *Journal of the Economics of Ageing* 5 (1): 14–22.
- Oosthuizen, M., K. Lilenstein, F. Steenkamp, and A. Cassim. 2016. "Informality and Inclusive Growth in Sub-Saharan Africa." ELLA Regional Evidence Papers, Lima, Peru.
- Statistics South Africa. 2017. *Labour Market Dynamics in South Africa 2015*. Pretoria: Statistics South Africa. Dataset.
- UN (United Nations). 2017. *World Population Prospects: The 2017 Revision*. New York, NY: UN Department of Economic and Social Affairs, Population Division.
- Vallin, J. 2007. "The Demographic Window." *Asian Population Studies* 1 (2): 149–167.
- Vanek, J., M.A., F. Chen, J. Carré, J. Heintz, and R. Husmanns. 2014. "Statistics on the Informal Economy: Definitions, Regional Estimates and Challenges." WIEGO Working Paper (Statistics No. 2), Cambridge, MA.
- World Bank. 2012. *World Development Report 2013: Jobs*. Washington, DC.
- . 2017. *World Development Indicators*. Washington, DC.

ANNEX 1

POPULATION PROJECTIONS

TABLE A1.1

Population projections, by global region and decade, 2013–63 (millions)

Region	2013	2023	2033	2043	2053	2063
Asia	4,331	4,733	5,021	5,196	5,268	5,244
Europe	740	743	737	725	711	693
Latin America & Caribbean	619	682	732	766	784	787
Northern America	351	377	403	423	440	456
Oceania	38	44	49	54	58	62
Africa	1,135	1,487	1,818	2,226	2,658	3,095
World	7,213	8,110	8,826	9,390	9,919	10,338
Africa share (%)	15.7	18.3	20.6	23.7	26.8	29.9

Source: Calculations based on medium variant projections (UN 2017).

TABLE A1.2

Working age population projections, by global region and decade, 2013–63 (millions)

Region	2013	2023	2033	2043	2053	2063
Asia	2,939	3,195	3,349	3,391	3,338	3,243
Europe	498	474	450	427	401	390
Latin America & Caribbean	411	459	489	500	492	473
Northern America	234	241	245	256	265	268
Oceania	25	28	31	34	36	38
Africa	627	824	1,076	1,357	1,656	1,969
World	4,734	5,221	5,640	5,966	6,188	6,381
Africa share (%)	13.2	15.8	19.1	22.7	26.8	30.8

Source: Calculations based on medium variant projections (UN 2017).

TABLE A1.3

Working age population projections, by global region and youth and non-youth age groups, 2013 and 2063 (millions)

Region	Youth (ages 15–24)				Non-youth (25–64)			
	2013	2063	Change	Average annual (%)	2013	2063	Change	Average annual (%)
	Number	Number	Number	(%)	Number	Number	Number	(%)
Asia	735	624	-111	-0.3	2,204	2,619	415	0.3
Europe	86	73	-13	-0.3	412	317	-95	-0.5
Latin America & Caribbean	110	87	-23	-0.5	301	386	85	0.5
Northern America	49	52	3	0.1	185	216	31	0.3
Oceania	5	8	3	0.9	19	30	11	0.9
Africa	220	537	317	1.8	407	1,431	1,024	2.5
World	1,207	1,382	175	0.3	3,528	4,999	1,471	0.7
Africa share (%)	18.2	38.9	na	na	11.5	28.6	na	na

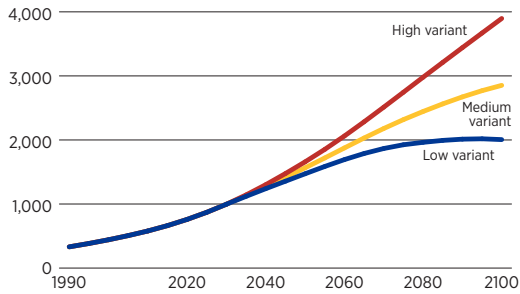
Source: Calculations based on medium variant projections (UN 2017).

FIGURE A1.1

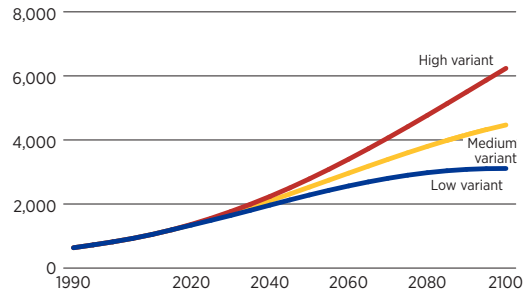
African population and working age population projections, three projection variants, 1990–2100

Millions

Working age population



Total population

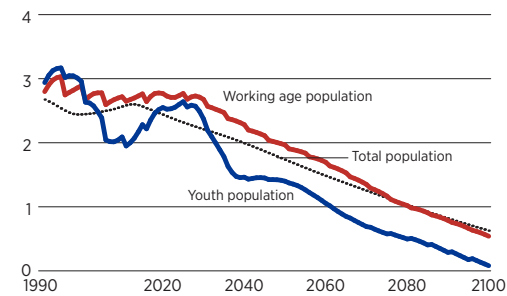


Source: Calculations based on three variant projections (UN 2017).

FIGURE A1.2

African population, working age, and youth population projections, 1993–2063

Growth rate (%)

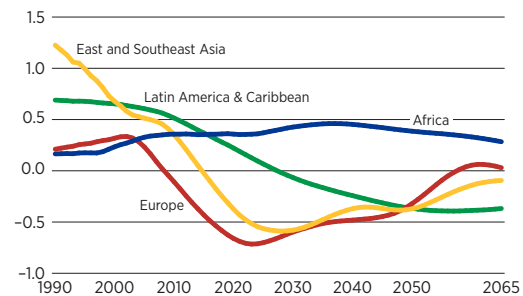


Source: Calculations based on medium variant projections (UN 2017).
 Note: Scatter plots represent annual growth rates calculated from the UN projections. A local polynomial smoothed line (kernel function is epanechnikov; degree of polynomial is 1) is fitted to the working age population estimates. Growth rates for the youth population are calculated as a three-period moving average of growth rates.

FIGURE A1.3

Simulated first demographic dividend, by global region, 1993–2063

Percent



Source: Calculations based on medium variant projections (UN 2017) and NTA database (2017).
 Note: Simulated demographic dividends are based on regional population projections and the median consumption and labor income profiles for each region, based on the countries for which there is data. These estimates are indicative only and individual country experiences may differ substantially from regional estimates.

ANNEX 2

PROJECTED CHANGES IN POPULATION STRUCTURE IN SELECTED AFRICAN COUNTRIES

Nigeria

Over the half-century to 2063, Nigeria, the continent's most populous country, is expected to add another 345.8 million people to the global population (table A2.1). The first decade of the period will see the country's population grow by 50.5 million, accelerating to 72.0 million between 2033 and 2043, and roughly 80 million in each of the last two decades.

Between 2013 and 2023, the cohorts 0–14 year old and 15–24 years old account for over 60.0 percent of the expected population expansion, with those under age 15 accounting for two-thirds of that growth. Over 2023–33, children under age 15 are projected to remain the biggest source of overall population growth, although their share is expected to decline from 38.2 percent to 30.2 percent of the total. As the two youngest cohorts gradually decline in their share of population growth, 25–34 year olds are projected to see their share rise from 12.0 percent during 2013–23 to 18.5 percent during 2023–33, a rise of 6.5 percentage points. Between 2023–33 and 2033–43, 35–44 year olds will see a large jump in their share of population growth, from 9.9 percent to 15.6 percent; their share rises further to 17.2 percent in the following decade.

The sources of overall population growth in Nigeria between 2013 and 2063 will vary over time (table A2.1). Initially, children and youth will be the dominant sources of population growth, but during 2033–43 their combined share will fall below 50 percent. Around that time, 25–34 year olds will see their share of population growth peak at 19.0 percent, followed by 35–44 year olds at 17.2 percent in 2043–53, and 45–54 year olds at 16.1 percent in 2053–63. For working age cohorts, these peak contributions are all between 2 and 5 percentage points higher than their contributions for the full period. While children and youth will become less important contributors to population growth over time, they are expected to remain an important focus of policymakers as even in 2033–43 they are expected to account for 44.2 percent of growth. Older cohorts will also see substantial increases in their contributions to population growth, although their peak contributions are likely to occur after 2063. By the final decade of the period, 55–64 year olds will account for 12.4 percent of Nigerian population growth, while those 65 years or older will account for 8.9 percent (up from 4.5 percent and 2.9 percent during the first decade of the period).

The youthfulness of the Nigerian population is also reflected in the structure of its working age

TABLE A2.1
Projected population change in Nigeria, by age group, 2013–63

Percentage share of population growth

Decade	Children		Working age population				Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	38.2	22.6	12.0	11.4	8.4	4.5	2.9	50,519
2023–33	30.2	22.2	18.5	9.9	9.1	6.3	3.8	61,340
2033–43	27.0	17.2	19.0	15.6	8.3	7.2	5.7	72,036
2043–53	21.3	17.2	15.9	17.2	13.8	7.1	7.4	79,213
2053–63	15.9	14.9	16.6	15.3	16.1	12.4	8.9	82,710
2013–63	25.2	18.3	16.6	14.3	11.6	7.9	6.1	345,818

Source: Calculations based on medium variant projections (UN 2017).

population: the older the age cohort, the smaller its share of the working age population (figure A2.1). Indeed, this pattern remains throughout the 2013–63 period.

Youth (15–24 year olds) are expected to rise to about 36.4 percent of the working age population until around 2030 and then steadily decline to just below 30.0 percent by 2063. The proportion of 25–34 year olds is projected to decline between 2013 and 2025, rise steadily toward 2040, and then gradually decline until 2063. Over the entire 50-year period, the cohort of 25–34 year olds is projected to decline by only 2 percentage points. The 35–44 year age group is expected to grow steadily as a proportion of the working age population until 2018, gradually decline until 2030, and then grow until 2056, by which time it will constitute 20.1 percent of the working age population. Over the last decade of the period, no real change is expected in the relative size of this cohort within the working age population.

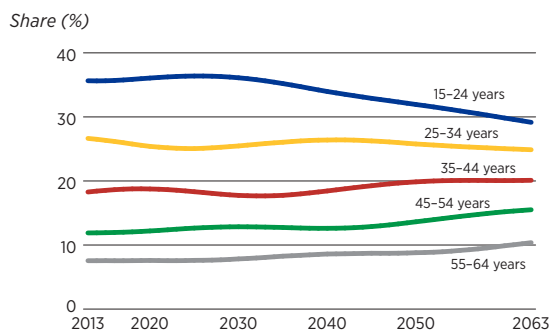
Growth in the relative importance of the oldest two working age cohorts is projected to occur only during the later part of the period. For 45–54 year olds, the share of the working age population is projected to grow gradually between 2013 and 2030, to remain flat between 2030 and 2045, and then to rise steadily until 2063. For 55–64 year olds, the share of the working age population remains flat until 2030; thereafter it rises slowly until around 2040 and finally resumes its upward trend after 2050. By 2063, however, 55–64 year olds will account for over 10.0 percent of the working age population.

Democratic Republic of the Congo

Democratic Republic of the Congo (DRC) is currently the fourth most populous country in Africa, with an estimated population of 81.3 million in 2017. It is projected to be the second largest contributor of all African countries to the expansion of the continental working age population between 2013 and 2063. In total, the country's population is projected to expand by 180.3 million

FIGURE A2.1

Working age cohorts as a share of total working age population in Nigeria, by age group, 2013–63



Source: Calculations based on medium variant projections (UN 2017).

over the period (table A2.2). The DRC's population is expected to rise from 26.8 million during 2013–23, to 38.3 million during 2033–43, and to 41.8 million during the final decade of the period.

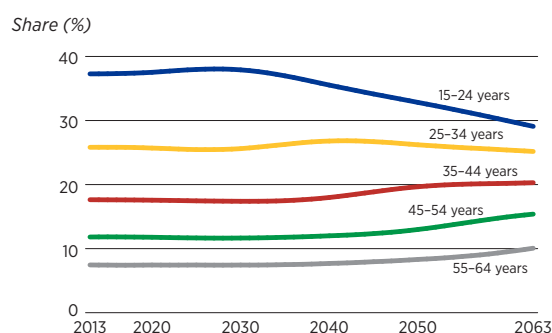
As in Nigeria, the largest contributors to population growth in the DRC will initially be children under 15 years and youth 15–24 years old. Children under 15 years are projected to be responsible for 41.8 percent of population growth between 2013 and 2023, while 15–24 year olds will account for just over half of that (21.5 percent). Together, these two cohorts will account for 63.3 percent of population growth in the decade 2013–23, falling to 55.3 percent in 2023–33 and to 44.9 percent in 2033–43. Children under 15 years, in particular, will see a rapid decline in their contribution to total population growth: their share will fall by 9.7 percentage points between the first and second decades, and by a further 5.7 percentage points between the second and third decades. Their share of population growth will fall by almost 30 percentage points over the period, a shift that is more pronounced than that projected to occur in Nigeria.

Over the first two decades of the period, youth will account for their peak share of total population growth. After accounting for 23.2 percent of growth in 2023–33, their share is expected to decline fairly rapidly to just 13.4 percent by the final decade of the period. Growth will cascade

through the cohorts over the period: the share of 25–34 year olds will peak at 19.9 percent in 2033–43, that of 35–44 year olds at 18.3 percent in the following decade, and that of 45–54 year olds at 17.5 percent in the final decade of the period. Among the two oldest cohorts there will be remarkable change: 55–64 year olds will triple their share of population growth from 4.1 percent in 2013–23 to 12.4 percent in 2053–63, while those ages 65 years and older will see their share more than triple, from 3.1 percent to 10.9 percent during the same time. Thus, by the final decade of the period, of the 41.8 million increase in population in the DRC, more than 4.5 million will be 65 years or older, well up from under 1 million in 2013–23.

The pattern observed in table A2.2 is broadly reflected in figure A2.2. Initially, youth is the only age group that is expected to experience growth as a proportion of the working age population. After 2030, those 15–24 years old begin a steady decline relative to the size of the working age population, while at the same time the proportion of 25–34 year olds increases, peaking in 2040 before declining again. Between 2035 and 2054, 35–44 year olds are projected to increase their share of the working age population gradually to 20.0 percent, where it is expected to remain for the rest of the period. From 2040 onward, a similar increase is expected for both 45–54 year olds and 55–64 year olds, with the two groups projected to constitute

FIGURE A2.2
Working age cohorts as a share of total working age population in Democratic Republic of the Congo, by age group, 2013–63



Source: Calculations based on medium variant projections (UN 2017).

15.4 percent and 10.1 percent of the working age population by 2063.

Ethiopia

Ethiopia is currently Africa’s second most populous country, with an estimated population in 2017 of 105.0 million people. During the 50 years over 2013–63, the country’s population is expected to grow by just under 123.0 million, with the largest additions to the population expected to be more than 26 million in each of the decades 2023–33 and 2033–43 (table A2.3). By the final decade of the period, the country’s population is expected to grow by 20.1 million, roughly a quarter less than during the peak decades. Ethiopia is, therefore,

TABLE A2.2
Projected population change in Democratic Republic of the Congo, by age group, 2013–63

Percentage share of population growth

Decade	Children		Working age population				Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	41.8	21.5	13.7	9.5	6.3	4.1	3.1	26,844
2023–33	32.1	23.2	17.3	11.0	7.5	4.8	4.0	32,742
2033–43	26.4	18.5	19.9	14.7	9.2	6.1	5.3	38,304
2043–53	18.4	17.4	17.1	18.3	13.3	8.1	7.4	40,931
2053–63	12.1	13.4	17.0	16.7	17.5	12.4	10.9	41,833
2013–63	24.6	18.4	17.2	14.5	11.3	7.5	6.5	180,383

Source: Calculations based on medium variant projections (UN 2017).

TABLE A2.3**Projected population change in Ethiopia, by age group, 2013–63***Percentage share of population growth*

Decade	Children		Working age population				Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	19.0	21.9	24.1	15.5	10.0	4.8	4.8	25,854
2023–33	13.9	12.5	21.0	22.9	14.5	9.0	6.3	26,955
2033–43	4.7	11.9	13.1	21.6	23.0	14.2	11.5	26,113
2043–53	–0.8	5.0	13.0	14.3	23.2	24.0	21.3	23,901
2053–63	–6.7	0.6	6.1	15.5	17.1	26.5	41.0	20,138
2013–63	6.8	10.9	16.0	18.2	17.5	15.0	15.7	122,961

Source: Calculations based on medium variant projections (UN 2017).

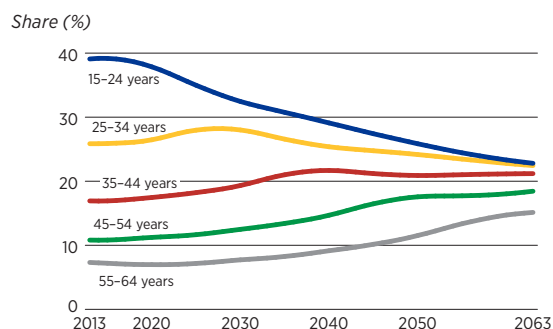
further ahead than most countries in its demographic transition.

In contrast to Nigeria and the DRC, at no point during the period are children under 15 years the dominant contributor to total population growth in Ethiopia. Instead, it is the 25–34 years old cohort that is expected to contribute the most between 2013 and 2023, accounting for 24.1 percent of growth over this period. Thus, the population under 25 years of age is expected to contribute just 40.9 percent of total population growth in 2013–23, and just 26.4 percent in the following decade. By 2033–43, children will account for a smaller proportion of total population growth than any other cohort, and in the final two decades of the period the population under 15 years old will contract. The youth population follows a similar trajectory roughly a decade later: the youth population will account for just 5.0 percent of total population growth by 2043–53, and will barely grow during the final decade of the period.

Instead, the dominant cohorts in Ethiopia’s population growth over the 50-year period are 35–44 year olds (18.2 percent) and 45–54 year olds (17.5 percent). For 35–44 year olds, the peak contributions are projected to occur during 2023–33 (22.9 percent) and 2033–43 (21.6 percent), while 45–54 year olds are expected to account for 23.0 percent during 2033–43 and 23.2 percent during 2043–53. However, Ethiopia may be unique

in the extent to which older adult cohorts are expected to drive population growth. In 2043–53, 55–64 year olds will be the dominant contributor to overall population growth (24.0 percent), while those 65 years and older will contribute 41.0 percent to population growth during the final decade of the period. These two cohorts will therefore account for more than two-thirds (67.5 percent) of total population growth in 2053–63, or more than 13.5 million of 20.1 million people. The result is that the cohorts are far more balanced in their contributions to population growth over the full period, with all but the youngest two cohorts each accounting for 15–19 percent of the growth.

This rapid demographic change is seen clearly in the changing structure of the Ethiopian working age population between 2013 and 2063 (figure A2.3). The youth cohort, for instance, reached its peak share of the working age population in 2015 and is expected to experience a substantial decline over the 50-year period, from 39.2 percent at its peak to just 22.8 percent by 2063. The peak for 25–34 year olds is expected to occur just before 2030, at 28.2 percent of the working age population, after which it will decline gradually. By 2063, these two groups are expected to each constitute 22–23 percent of the working age population. The 35–44 year cohort is projected to grow from 16.9 percent of the working age population to 21.7 percent by 2040, before declining slightly to 21.2 percent by 2063. Both 45–54 year olds and

FIGURE A2.3**Working age cohorts as a share of total working age population in Ethiopia, by age group, 2013–63**

Source: Calculations based on medium variant projections (UN 2017).

55–64 year olds are expected to grow as a share of the working age population from 2030 onward, showing steady growth until 2063.

Ethiopia is clearly different from the other countries discussed in this annex in the degree to which the population structure has already changed. The country is unique in that the child population is projected to decline during the final two decades of the period. It is also unique in that each of the five working age cohorts is fairly similar in its contribution to the working age population by 2063, with contributions within a range of fewer than 10 percentage points. In particular, the three youngest cohorts are projected to contribute very similar proportions to the working age population.

Tanzania

Tanzania is currently the fifth most populous country on the continent, with an estimated 57.3 million people in 2017. The 50 years to 2063 will see the country's population expand by 129.4 million people to reach 180.1 million, more than three and a half times its 2013 population. The 2013–23 period will see the population expand by almost 18.0 million, and by the final decade of the period it will grow by 32.7 million (table A2.4).

The youthfulness of the Tanzanian population is evident in table A2.4. The 2013–23 period will see 59.6 percent of total population growth contributed by the two youngest cohorts: in particular, children under 15 years old will account for 38.1 percent of population growth during the decade. The child cohort will remain the single most important cohort for its contribution to population growth for the entire period, although it will decline in importance to just under one-fifth of total growth in 2053–63. The youth cohort's contribution to population expansion is highest during the first two decades of the period, at just over one-fifth of the total. By the final decade of the period, however, it will account for just 14.8 percent due largely to the rapid rise in importance of the oldest three cohorts. In particular, those 65 years and older will almost quadruple their share of total population growth between the first and final decades of the period, from 3.3 percent in 2013–23 to 11.4 percent in 2053–63.

TABLE A2.4**Projected population change in Tanzania, by age group, 2013–63**

Percentage share of population growth

Decade	Children		Working age population				Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	38.1	21.5	13.5	11.2	8.4	4.1	3.3	17,955
2023–33	31.5	21.0	17.2	10.8	8.9	6.3	4.2	22,275
2033–43	28.7	16.9	17.6	14.3	9.0	7.1	6.5	26,561
2043–53	23.4	17.1	14.9	15.5	12.4	7.7	9.0	29,959
2053–63	19.4	14.8	15.7	13.7	14.0	11.0	11.4	32,695
2013–63	26.9	17.8	15.9	13.4	10.9	7.7	7.5	129,445

Source: Calculations based on medium variant projections (UN 2017).

11.4 percent in 2053–63. Similarly, 55–64 year olds will almost triple their contribution, to 11.0 percent, while 45–54 year olds will see their share of growth increases from 8.4 percent to 14.0 percent over the same period.

These patterns mean that Tanzania will see its child population grow by an average of 680,000–770,000 annually in the first four decades of the period, slowing only marginally to 634,000 a year in the final decade. At the same time, the final decade of the period will see an additional 3.7 million people 65 years or older, compared with fewer than 600,000 during the first decade. However, in absolute terms, growth in the child population will still be 70 percent larger than that of the elderly population.

These patterns are reflected in the expected changes in the structure of the working age population in Tanzania (figure A2.4). As in Ethiopia, the youth cohort is currently close to its peak share of the working age population—in 2013, it constituted 37.6 percent of the working age population—but, unlike in Ethiopia, the decline of this cohort’s share is expected to be gradual. Youth will see their share really begin to decline only in the late 2020s, and by 2063 it will have fallen only 8.0 percentage points over the 50-year period.

The cohort of 25–34 years olds is expected to remain relatively constant as a share of the working

age population throughout the period, declining only 2.1 percentage points between 2013 and 2063. The three older working age cohorts will grow in importance within the working age population. However, in each instance, the increase is expected to be less than 5 percentage points.

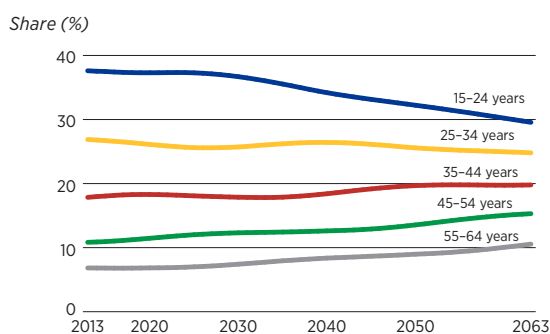
Uganda

Uganda is currently Africa’s eighth most populous country, with a total population estimated at 42.9 million in 2017. During the 50 years 2013–63, Uganda’s population is projected to grow by 98.8 million, to 136.4 million, or 3.6 times the number in 2013 (table A2.5). The growth in the number of people is expected to accelerate from 14.3 million in the first decade to 23.3 million in the final decade of the period.

As with other countries with young populations, in Uganda the child cohort is expected to be the primary population growth driver for much of the period. However, that cohort’s share of total population growth will decline from 38.1 percent in 2013–23, to 26.2 percent in 2033–43, and to 15.4 percent in 2053–63. But only in the final decade will this cohort not account for the largest proportion of population growth in Uganda. The population boom has already entered the youth cohort, with youth expected to see its share of population growth fall from 22.3 percent in 2013–23 to 13.6 percent in 2053–63. Together then, the share of the population ages 25 and younger will fall from 60.4 percent in 2013–23 to 29.0 percent in 2053–63.

The middle three decades of the period will see the share of 25–34 year olds in population growth peak at 17–18 percent. However, this peak is not much higher than the cohort’s 16.8 percent share for the 50-year period as a whole. As in other countries, older cohorts will become more important sources of population growth later in the period. The final decade will see 35–44 year olds account for the largest share of population growth (although, admittedly, less than a percentage point higher than for children and 25–34 year olds). The

FIGURE A2.4
Working age cohorts as a share of total working age population in Tanzania, by age group, 2013–63



Source: Calculations based on medium variant projections (UN 2017).

TABLE A2.5**Projected population change in Uganda, by age group, 2013–63***Percentage share of population growth*

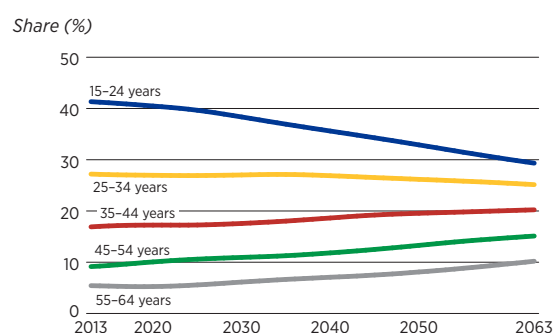
Decade	Children		Working age population				Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	38.1	22.3	15.8	10.8	7.9	3.2	2.0	14,268
2023–33	32.5	20.3	17.8	12.4	8.2	5.8	3.0	17,659
2033–43	26.2	18.8	17.4	15.2	10.4	6.6	5.5	20,540
2043–53	20.1	16.6	17.1	15.8	13.6	8.9	7.9	22,641
2053–63	15.4	13.6	15.9	16.3	14.9	12.3	11.6	23,275
2013–63	25.1	17.8	16.8	14.4	11.4	7.9	6.6	98,834

Source: Calculations based on medium variant projections (UN 2017).

two oldest cohorts, which currently contribute little to total population growth, will rise rapidly in importance as drivers of population growth over the period: 55–64 year olds will almost quadruple their share from 3.2 percent in 2013–23 to 12.3 percent in 2053–63, while those 65 years and older will see an even more dramatic rise, from 2.0 percent to 11.6 percent. This means that while the first decade of the period will see the addition of just 285,000 more people over 65 years old, the final decade will see this cohort grow by 2.7 million people.

In 2013, the youth cohort constituted 41.3 percent of the working age population. This share is expected to decline continuously till by 2063 it constitutes 29.3 percent of the working age population (figure A2.5). Between 2013 and 2034, the population of 25–34 year olds is projected to grow from 26.9 percent to 27.1 percent of the working age population, an increase of 0.2 percentage points. However, from 2034 onward, it is expected to decline in each subsequent year. In 2063, this age group is projected to constitute 25.1 percent of the working age population, a decrease of 2 percentage points from its peak.

The three oldest working age cohorts are projected to grow as a proportion of the working age population in each year of the period. The population 35–44 years old is expected to grow from 17.3 percent of the working age population to 20.2 percent

FIGURE A2.5**Working age cohorts as a share of total working age population in Uganda, by age group, 2013–63**

Source: Calculations based on medium variant projections (UN 2017).

by 2063; those 45–54 years old are expected to grow their share of the working age population by two-thirds, from 10.6 percent in 2013 to 15.1 percent in 2063. The population of 55–64 year olds is predicted to grow most rapidly, from 5.8 percent of the working age population in 2013 to 10.2 percent by 2063. Thus, by the end of the period, each cohort will account for between 10 percent and 30 percent of the working age population.

Egypt

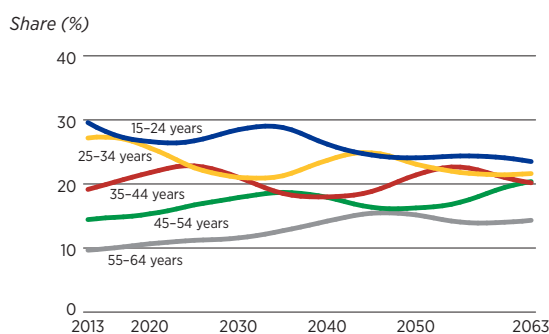
Egypt is currently Africa's third most populous country, with an estimated population of 97.6 million people in 2017. Over the half-century from 2013 to 2063, its population is projected to grow by 80.8 million, to 170.6 million, a 90 percent

increase. However, the absolute increase in the population is projected to fall over the period: the population is expected to expand by 18.3 million during the decade 2013–23 but to fall by 12.9 million in 2053–63 (table A2.6).

Egypt's projected population growth profile differs from that of the other countries presented in some ways. One is the similarity in each cohort's contribution to population growth over the 2013–63 period, which generally ranges between 10 percent and 15 percent (table A2.6). Only 45–54 year olds (17.8 percent of population growth) and those ages 65 years and older (22.1 percent) fall outside this range. However, there are large fluctuations in cohorts' contributions to total population growth. The projections also share some patterns with other countries. Thus, for example, the child cohort is expected to contribute a generally declining share of total population growth, falling from 33.2 percent in 2013–23, to –7.6 percent in 2053–63. Despite accounting for one-third of population growth in the first decade of the period, its contribution is far smaller (and even negative) in the subsequent decades.

This boom cohort of children in 2013–23 will cascade through the population structure over time, so that, in turn, each of the next four cohorts contributes significantly to population growth in the following four decades. Youth will be responsible for 35.2 percent of population growth in 2023–33, and by the final decade of the period, 45–54 year

FIGURE A2.6
Working age cohorts as a share of total working age population in Egypt, by age group, 2013–63



Source: Calculations based on medium variant projections (UN 2017).

olds will account for 44.9 percent of population growth. These large contributions in one decade are followed by a decade of contraction and then a decade of slight recovery. In contrast, the elderly cohort (those ages 65 and older) accounts for a consistently increasing share of population growth for almost the entire period. This cohort is projected to account for 9.1 percent of population growth in the first decade, rising to 36.3 percent in the fourth decade and 32.7 percent in the final decade of the period. Thus, the absolute increase in the elderly population will rise from around 1.7 million in 2013–23 to 5.6 million in 2043–53; the share then falls to 4.2 million in the final decade.

The unusual pattern of demographic expansion is reflected in figure A2.6, with cohort contributions

TABLE A2.6
Projected population change in Egypt, by age group, 2013–63

Percentage share of population growth

Decade	Children	Working age population					Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	33.2	5.5	3.3	24.0	14.4	10.5	9.1	18,310
2023–33	-0.9	35.2	6.5	3.3	25.3	15.0	15.7	16,696
2033–43	14.6	-2.5	33.8	6.5	3.4	23.1	21.2	17,422
2043–53	7.5	9.0	-2.7	37.6	7.5	4.4	36.3	15,552
2053–63	-7.6	11.7	11.4	-3.0	44.9	9.9	32.7	12,852
2013–63	10.7	11.6	10.7	14.3	17.8	12.9	22.1	80,832

Source: Calculations based on medium variant projections (UN 2017).

to total population growth peaking sequentially over time. Over the period, there is a general narrowing in the range of cohort shares of the working age population, falling from roughly 20 percentage points at the start of the period to less than 10 percentage points at the end. Overall, though, there is a gradual decline in the relative size of younger cohorts and a gradual rise in the relative size of older cohorts.

Angola

With a 2017 population estimated at 29.8 million, Angola is currently the 12th most populous country on the continent. The population is expected to grow by 74.4 million to 100.4 million by the end of the 50-year period 2013–63, almost tripling the 2013 population (table A2.7). In absolute terms, population growth will accelerate in each decade, rising from 10.1 million in 2013–23 to 19.0 million in 2056–63.

Children under the age of 15 years are expected to account for the largest share of population growth in each decade, although their share will fall by almost half over the period. In 2013–23, children will account for 39.9 percent of total population growth and in 2053–63 they will still account for 21.2 percent. Similarly, youth represent an important source of population growth, contributing 18.7 percent of growth over the period as a whole. Their share of total population growth is projected

to fall from 22.1 percent in 2013–23 to 16.0 percent in 2053–63, with their peak contributions coming in 2023–33 and 2033–43. Together, the population ages 25 years and younger will account for 62.0 percent of population growth in 2013–23, falling to 49.1 percent in 2033–43 and to 37.2 percent in 2053–63.

The older working age cohorts will see their contributions to total population growth rise relatively rapidly as those of children and youth decline. Over the 50-year period, 45–54 year olds will nearly double their share of population growth from 6.9 percent in 2013–23 to 13.3 percent in 2053–63, while 55–64 year olds will almost triple their share from 3.8 percent to 10.2 percent. The population 65 years and older will see its share rise slightly less rapidly, from 3.8 percent in the first decade of the period to 8.5 percent in the final decade. Over 2053–63, the population 65 years and older will grow by 1.6 million, well up from under 400,000 in 2013–23.

Unlike a number of other countries, Angola is expected to experience growth in the size of the cohort of 15–24 year olds as a share of the working age population until 2025 (figure A2.7). This share is expected to peak at 38.5 percent. Thereafter, youth's share is expected to decrease by an average of around 0.2 percentage point a year, so that by 2063 it will constitute 30.7 percent of the working age population. The cohort of 25–34 year olds is

TABLE A2.7

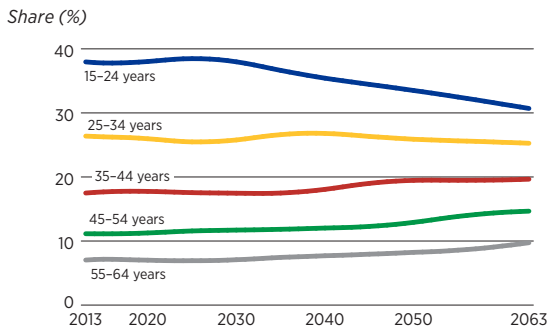
Projected population change in Angola, by age group, 2013–63

Percentage share of population growth

Decade	Children		Working age population				Elderly	Projected change in total population (1,000s)
	Ages 0–14	Ages 15–24	Ages 25–34	Ages 35–44	Ages 45–54	Ages 55–64	Ages 65+	
2013–23	39.9	22.1	13.4	10.1	6.9	3.8	3.8	10,111
2023–33	34.3	21.2	17.3	10.5	7.7	5.0	4.0	12,696
2033–43	31.0	18.1	17.4	14.1	8.4	6.0	5.1	15,271
2043–53	25.5	18.3	15.7	15.0	12.0	6.9	6.6	17,373
2053–63	21.2	16.0	16.6	14.2	13.3	10.2	8.5	18,980
2013–63	29.0	18.7	16.2	13.2	10.2	6.8	5.9	74,430

Source: Calculations based on medium variant projections (UN 2017).

FIGURE A2.7
Working age cohorts as a share of total working age population in Angola, by age group, 2013–63



Source: Calculations based on medium variant projections (UN 2017).

expected to remain fairly stable as a share of the working age population over the 50-year period: it is projected to grow slightly from 25.5 percent in 2013 to 26.8 percent by 2039, and then to decline by 1.5 percentage points to 25.3 percent by 2063.

Initially the share of 35–44 year olds is projected to remain constant at 17.5 percent of the working age population. From 2037 onward, however, there is consistent but gradual growth in this cohort’s share of the working age population to 19.6 percent by 2063. Both the 45–54 year old cohort and the 55–64 year old cohort are expected to grow as a share of the working age population every year between 2013 and 2063. The 45–54 year old cohort is forecast to increase from 11.6 percent of the working age population in 2013 to 14.7 percent by 2063, increasing its share by roughly one-quarter over the 50 years. The 55–64 year old cohort is expected to grow slightly faster, with its share of the working age population increasing from 6.9 percent to 9.7 percent by 2063. Thus, the range of cohorts’ shares of the working age population is projected to narrow from just over 30 percentage points in 2013 to just over 20 percentage points in 2063.

ENCOURAGING START-UPS IN TUNISIA'S NEW TECHNOLOGIES INDUSTRY

Davina Osei

African Development Bank

The Government of Tunisia passed a Start-up Act in April 2018. The main aim is to incentivize start-ups in the innovation and new technologies industry and to enhance their competitiveness and value added not nationally but internationally. After defining startups, the Act has four main themes: encouraging entrepreneurship, ease of creation and termination of start-ups, access to funding, and access to international markets. A number of innovative measures to encourage start-ups in the tech industry are centered around the last four of the five themes aforementioned.

Encouraging entrepreneurship

- *Job security.* Public officials and private sector employees who wish to start an enterprise are entitled to a one-year start-up leave without pay. This gives young entrepreneurs the security and freedom to explore entrepreneurship with the guarantee of having their old job back if the start-up fails.
- *Finance.* Start-ups are entitled to a one-year start-up scholarship which comes in the form of a government determined stipend for up to three founders of the start-up to ease liquidity constraints and reduce the precariousness start-up founders may face in the early stages.
- *Encouraging youth.* Young graduates, who wish to start-up a business or

join a start-up as an employee, are encouraged to do so by maintaining spots for them in Tunisia's largest youth employment program for up to three years. This serves as an employment guarantee for them, if the start-up does not succeed. So, they face no employment risks by starting up a new firm.

- *Intellectual property rights.* Intellectual property registration, both national and international, is also strongly encouraged. The government is to bear the full cost (direct and indirect) of IP registration at the national level. The government also bears the direct and indirect costs of IP registration by start-ups at the international level, but only within the limits of available resources.

Ease of creation and termination of start-ups

- *Ease of starting a firm.* The government is mandated to create a start-up portal. This will be where all the administrative and regulatory processes around the birth, growth and death of start-ups will be handled.
- *Social security.* The government assumes the payment of social security contributions of employers and employees of start-ups.
- *Ease of terminating a firm.* The government is also mandated to create a start-up guarantee fund to serve as a risk-reduction facility for investors

who wish to invest in start-ups. This fund is accessible at the termination stage of a start-up. Both start-ups and their investors can therefore close the firm fairly easily if challenges become insurmountable.

Access to funding

- *Tax benefits for investors.* Individuals and companies that invest directly in start-ups are given some tax benefits encourage potential investors.
- *Tax benefits for start-ups.* Start-ups are allowed to enjoy several tax exemptions, including those from capital gains and corporate taxes, and tax reductions on profits.
- *Convertible bonds.* Start-ups are also allowed to issue convertible bonds regardless of the option period for conversion.
- *In-kind contributions.* Start-ups that aim to raise their capital through in-kind contributions are allowed to select their own auditors.
- *Public procurement.* Start-ups will be considered as small business, "for which any public purchaser must reserve 20 percent of the annual budgeted amount of its goods, services, and studies contracts."

Access to international markets

- Start-ups have no capital controls on their foreign currency accounts.



THE GREATEST MIGRATION CHALLENGE OF ALL TIME?

Mustapha Kamel Nabl

North Africa Bureau of Economic Studies, Tunis

Economic pressures and incentives for migration from Sub-Saharan Africa to regions outside of Africa, especially Europe, are strong and likely to intensify over the next few decades. Growth in the number of people, especially the working age population; income differentials between Sub-Saharan Africa and Europe; and the mismatch between expectations and skills in labor markets are all pushing toward greater migration. So are other factors, such as the impact of climate change and social and political unrest.

Meanwhile, in Europe (and all over the world), the political environment and incentives are pushing in the opposite direction from those of demography, economics, and climate change. Populist movements are using actual or perceived large migration flows, often exaggerating their negative social and economic effects, to push for a closing of borders and for restrictions on migration.

This makes international migration from Sub-Saharan Africa a major challenge requiring close attention and innovative thinking. Managing these pressures and tensions should be central in both Africa and Europe. The current approach is in the interests of neither party. African countries are unable to benefit fully from their diaspora, including from remittances and transfers of knowledge and improved skills. Emigration may be biased toward the more skilled and educated population, limiting the growth of human capital in Africa. Europe has been pursuing dual policies on migration, encouraging and supporting migration of high-skilled workers while striving

to restrict other types of migration. Migration policy remains driven by short-term political considerations.

It is in the interest of Europe and Africa to avoid irregular and chaotic migration flows and to facilitate safe, orderly, and regular migration. A new and long-term shared vision is needed between Europe and Africa on this great migration challenge and on how to better manage large movements of people.

INTRODUCTION

Over the last decade and intensifying in recent years, the media have reported stories of catastrophic events as hundreds and thousands of migrants, mostly from Sub-Saharan Africa and the Middle East and North Africa, have drowned in the Mediterranean as they seek to reach Europe. Thousands of others have succeeded in reaching Europe, hoping to settle and begin a new life.

The media have also reported that these waves of migration are creating push-back in receiving countries. Fear of migrants is fueling political nationalist and xenophobic movements opposing migration and helping anti-immigration politicians reach positions of power.

Demographic and economic forces are creating the potential for the greatest migration challenge ever, which may play out over the next few decades, involving Sub-Saharan Africa and Europe. Three major forces are generating push and pull factors working in concert toward greater international migration movements between these regions: the unprecedented demographic shifts in both regions; the huge income differentials between them, which are likely to grow even larger; and, less appreciated, the mismatch between the supply of skills (education) and demand for them (structural transformation) in Sub-Saharan Africa.

These factors are generating pressures that are resulting in migration within Africa as well as to regions outside it. In the last few decades, most emigration from Sub-Saharan African countries has been to other countries in the region. This type of migration, though it presents many important challenges and policy issues, is not discussed in this study,¹ which focuses on the rapidly increasing emigration outside Sub-Saharan, in particular to European countries. While emigration has been increasing, politics in European countries is pushing in the opposite direction, toward more closed borders and restrictions on peoples' movements. These opposing trends may be the source of considerable trouble ahead.

The next section examines the first two forces, demographics and income differentials. Skills mismatches are analyzed in the following section. After that, the propensity to emigrate inside or outside of Africa is briefly examined. The special case of the Sahel region, where the migration push factors are strongest, is then briefly considered. The final section presents some policy implications.

DEMOGRAPHIC AND INCOME DIFFERENTIALS IN SUB-SAHARAN AFRICA AND EUROPE

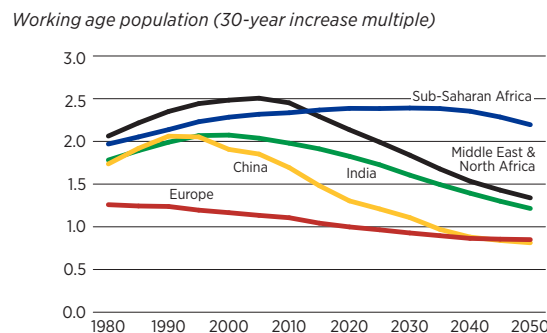
Transformative demographic changes

Even if relative economic conditions in Sub-Saharan Africa and Europe were to remain unchanged over the next few decades, demographic dynamics alone would be expected to fuel huge migration pressures. Push and pull factors are working in the same direction to spur more migration from Sub-Saharan Africa to Europe.

Over the last 50 years, Sub-Saharan Africa's population has more than doubled as measured in rolling 30-year intervals, calculated every 5 years (figure 1). The highest rate of increase, of 128 percent, was registered for 1965–95 and persisted until around 2010. The closest similar increase was in the Middle East and North Africa region during the 1980s and 1990s.

The population of Sub-Saharan Africa will continue to increase by more than 120 percent for every 30-year interval until 2030. In absolute numbers, the population increase was 562 million people over 1985–2015 and is likely to reach 1.1 billion

FIGURE 1
Growth of the working age population in Sub-Saharan far outpaces that in other regions, 1980–2050 (overlapping 30-year increases, calculated every 5 years)



Source: UN 2017.
Note: In this figure, Sub-Saharan Africa includes Sudan, which the UN data include in North Africa.

over 2020–50. This is bigger than the largest absolute increase ever experienced by China (517 million over 1965–95) or India (534 million over 1980–2010).

Even starker acceleration is occurring in the working age population in Sub-Saharan Africa, from an increase of 100 percent every 30 years in the 1970s to 140 percent since the 1990s. While the relative growth of the working age population is slowing, the increase in absolute numbers is skyrocketing, from 314 million during 1985–2015 to 755 million during 2020–50. This increase will be the largest in history: for China the largest increase reached 440 million during 1975–2005 and for India 418 million during 1990–2020.

Meanwhile, the working age population in Europe has been declining since 2005–10. Over the 30 years 2010–40, the working age population is expected to decline further, by 10–15 percent.

An unprecedented youth (ages 15–24 years) bulge is taking shape in Sub-Saharan Africa. The number of young people is likely to more than double from 198 million in 2015 (about the same as in China, 182 million) to 422 million in 2050 (three times that of China, 132 million).

These demographic dynamics have huge implications for the labor force. Projections can illustrate this impact, based on the simple assumption that the labor force participation rates of 2015 will continue to apply in the future. The 30-year increase in Sub-Saharan Africa, which was 255 million during 1985–2015, will reach more than 523 million during 2020–50. The number of additional entrants to the labor force will double from 10 million a year during 2010–15 to 20 million a year during 2045–50. All other global regions are expected to have stable or declining rates of change. China (in East Asia) is already on a declining trend, which is expected to turn negative by 2030.

The diverging demographic trends in the working age population and labor force between

Sub-Saharan Africa and Europe are stark, with both groups rising rapidly in Sub-Saharan Africa and declining in Europe (figure 2). The labor force in Sub-Saharan Africa, which was about the same as Europe's in 2012–13, is likely to be more than three times larger by 2050, creating huge pressures for migration.

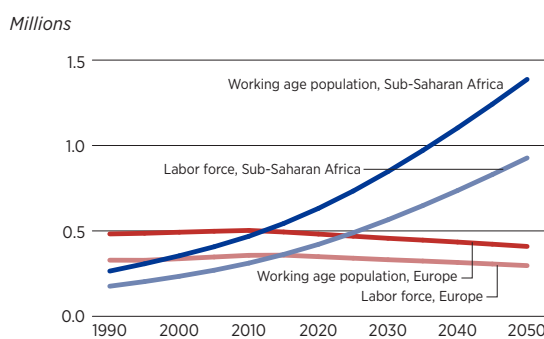
Increasing income differentials between Sub-Saharan Africa and Europe

The demographic dynamics in Sub-Saharan Africa have the potential for leading to a large demographic dividend in increased economic growth and improved standards of living. The working age population is increasing at around 2.9 percent a year currently and will continue to do so for the next few decades. Total employment could be increasing at the same rate, and assuming unchanged productivity trends, this would boost GDP per capita growth.²

While realizing such a dividend would be expected to reduce migration pressures through a reduction in income differentials, this is unlikely no matter how successful Sub-Saharan Africa is in realizing the demographic dividend.

This point can be illustrated through a set of long-term projections of incomes in Sub-Saharan Africa and advanced economies (representative of

FIGURE 2
Working age population and labor force demographics diverge starkly between Sub-Saharan Africa and Europe, 1990–2050



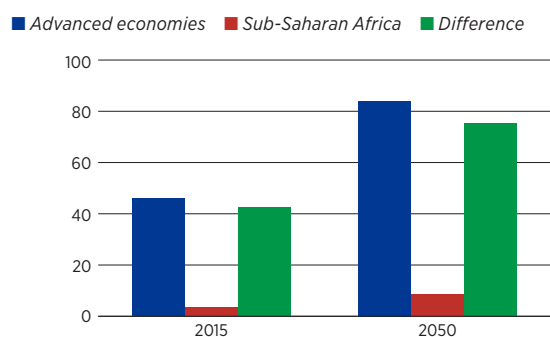
Source: UN 2017.

Europe) produced by the Emerging Markets Forum.³ In the base or central case scenario, GDP per capita (in 2011 purchasing power parity dollars) is likely to grow much faster in Sub-Saharan Africa over 2015–50 than in advanced economies. However, the relative difference shrinks only slightly, from 92 percent to 90 percent, while the absolute differential in incomes per capita is likely to increase by 77 percent, from \$42,000 to \$75,000 (figure 3). Even in the case of an optimistic scenario, with higher GDP per capita growth in Sub-Saharan Africa (6.8 percent a year instead of the 5.1 percent in the base scenario), the absolute income differentials would increase by 68 percent, from \$42,000 to \$71,000.

If Sub-Saharan Africa does not achieve its growth potential and realize the demographic dividend, income differentials would be even larger and migration pressures would be greater. But given the scope of the demographic dynamics in Sub-Saharan Africa and income differentials with advanced economies, the overall pressures are likely to further intensify pressures for international migration. In addition, migration pressures will be compounded by other migration incentives due to the mismatch between the supply of and demand for skills in Sub-Saharan Africa, as discussed next.

FIGURE 3
Projections of changes in GDP per capita in Sub-Saharan Africa and advanced countries show a widening of the differential between 2015 and 2050

2011 purchasing power parity dollars



Source: Kohli 2016.

Note: Base or central case scenario, assuming annual GDP per capita growth of 5.1 percent.

SUPPLY AND DEMAND FOR SKILLS AND MIGRATION

Education levels significantly affect the propensity to migrate.⁴ People with a secondary or tertiary education are more likely to migrate than people with less education. Global data show that the number of migrants from Africa with a tertiary degree moving to OECD countries increased by 130 percent over 1990–2010 compared with a 40 percent increase for people with low skills.⁵

Many factors affect the flow of more skilled migrants, including demand and policies in destination countries, wage differentials between origin and destination countries, and the presence of multinational corporations. Conditions in the origin country are especially important. In addition to the demographic and income differentials, which are quantitative factors creating incentives for migration, the mismatch between the supply of and demand for skills in the origin country, relatively neglected in the literature, may play a major role.

The supply of skills and human capital is driven by demography and education policies. The demand for skills is driven by structural transformation—the movement of factors of production from low- to high-productivity economic activities. Nothing guarantees that supply and demand will match, and outcomes may be disastrous.

Such mismatches create a gap between expectations and reality for young people. When they and their families invest in education, they expect positive economic returns and improved social status. If they find themselves unemployed or having to accept jobs that are not consistent with their expectations, they are frustrated. From a social point of view, the investment in education is less productive, and social and political unrest may develop.

These situations create greater incentives for migration for people with higher education and skills through both push and pull factors. The low returns to education in a developing country are

countered by much higher returns in Europe. And quality of governance, with aspirations for more freedom and democracy, and quality of life factors become more important for young people with better skills.

The experience of Asia and the Middle East and North Africa

Comparing the experience of Asia and the Middle East and North Africa (MENA) is illuminating for assessing skills mismatches in supply and demand and its implications.

In Asia, the supply of skills was geared toward meeting demand, with a greater focus in the six sample countries on growth of secondary education than of tertiary education (table 1). In 1985, there were already high levels of schooling (except in India), and these continued to rise in the six countries in the sample. The percentage of the population (ages 15 and older) with secondary schooling rose from an average of 9 percent in 1985 to 25.7 percent in 2010, excluding Korea. The most dramatic change was in Malaysia, where the secondary education share rose from 19 percent to 40 percent of the population. Growth was moderate in tertiary education. The percentage of the population (ages 25 and older) with a tertiary education rose from 1.8 percent in 1985 to 5.9 percent in 2010, excluding Korea.

Korea is an exceptional case, with a very high initial level of secondary education. That rate rose from 32 percent in 1985 to 35 percent in 2010, while tertiary education surged, from 8.5 percent to 35 percent.

The education experience in MENA was similar to that in Asia, with very strong growth in both secondary and tertiary education. The share of the population with a secondary education rose from 10.5 percent in 1985 to 20 percent in 2010 in the 12 countries in the sample. There was also a rapid increase in access to tertiary education, with the share of the population with a tertiary degree rising from 3.8 percent in 1985 to 7.4 percent in 2010.

TABLE 1
Share of population with completed secondary and tertiary education in Asia and Middle East and North Africa, 1985 and 2010 (percent)

Region and country	Secondary education (percent of population ages 15 and older)		Tertiary education (percent of population age 25 and older)	
	1985	2010	1985	2010
Asia	13.2	27.4	2.9	10.7
India	0.6	25.0	2.1	6.1
China	14.6	22.9	0.9	2.4
Korea, Rep.	32.2	35.5	8.5	34.8
Malaysia	18.8	39.8	1.8	5.9
Thailand	5.2	19.0	3.4	10.0
Indonesia	7.7	22.1	0.8	5.0
Asia, excluding Korea	9.4	25.8	1.8	5.9
Middle East & North Africa	10.6	20.1	3.8	7.4
Algeria	11.3	17.1	1.3	6.8
Egypt	10.6	26.4	3.1	6.8
Iran	18.3	30.5	3.0	15.8
Iraq	8.8	17.4	3.2	9.5
Jordan	15.2	27.1	4.8	5.6
Libya	12.2	16.0	2.0	11.3
Morocco	4.8	12.1	1.9	6.3
Saudi Arabia	10.9	29.1	6.2	9.2
Syria	4.3	18.1	2.5	4.1
Tunisia	9.0	16.4	1.9	8.4
Turkey	4.1	20.5	7.0	7.1
Yemen	1.2	10.7	0.1	1.7

Source: World Bank, Education Statistics Database (data downloaded 7/27/2018).

While experiences vary in both regions, on average progress in secondary education is greater in Asia than in MENA, but the opposite is true for tertiary education. Libya and Tunisia stand out with the most rapid increase in the share of people with a tertiary education.

Demand for skills and structural transformation. The demand for skills is derived from the production system and depends on its level of sophistication and technology. In other words, it depends on the extent of the structural transformation of the economy and on the movement of labor from less productive, traditional activities to new, more productive activities requiring more skilled labor.

Asian countries have been very successful at achieving structural transformation with strong demand for skills.⁶ There has been a rapid, sustained movement of labor from agriculture to manufacturing and a movement up the ladder from low complexity and low capital intensity to higher complexity and more capital intensity in economic activities. In contrast, there has been limited structural transformation in MENA. Economies continue to generate low productivity jobs and weak demand for skills. The movement of labor from agriculture to manufacturing and from low complexity and low capital intensity to higher complexity and more capital intensity has been slow. Many countries have even experienced early deindustrialization.

Outcomes and unemployment. The differences in labor market outcomes between Asia and MENA are striking. Unemployment rates for the population with intermediate and advanced degrees vary considerably between the five Asian and four MENA countries for which data are available.

In Asian countries, unemployment is low for both intermediate and advanced education graduates. It is in the 1–4 percent range in Malaysia, Thailand, and Korea; 6–7 percent in India; and 10 percent in Indonesia. In MENA, the unemployment outcomes are completely different. Unemployment levels are very high for both intermediate and advanced education graduates. For countries with data available over a long period, it is evident that these rates have been rising.

Unemployment rates in MENA range from 14 percent to 23 percent for intermediate education graduates and from 18 percent to 30 percent for advanced education graduates. There is clearly a mismatch between the supply of education and skills and the demand from production systems, which is highest for workers with higher education levels and high skills. The high rates of unemployment and the lack of available jobs that meet the expectations of graduates are sources of frustration that fuel political and social unrest, such as the 2011 uprisings.

This mismatch has also created incentives for migration from MENA countries to Europe. No such migration pressures have been observed from Asian countries.

Demand and supply for skills in Sub-Saharan Africa

The experience of Sub-Saharan Africa is more complex, with varied outcomes across countries. But overall the experience is more like that of MENA than of Asia.

Education and skills. Sub-Saharan countries started in the 1980s from low levels of secondary and tertiary education compared with countries in Asia and MENA (table 3).

There has been considerable progress in access to secondary education, with the percentage of the population (ages 15 and older) with a secondary education more than doubling, from 6 percent in 1985 to 13 percent by 2010. But there is a lot of

TABLE 2
Unemployment rates for people with completed advanced and intermediate education in Asia and the Middle East and North Africa, 2010 or closest year (percent)

Region and country	With advanced education	With intermediate education
Asia		
India	7.4	6.9
Indonesia	9.9	10.5
Korea, Rep.	3.6	4.0
Malaysia	3.2	4.0
Thailand	1.8	1.0
Middle East & North Africa		
Algeria	22.8	22.4
Egypt	18.0	16.0
Morocco	30.0	18.0
Tunisia	23.0	14.0

Source: World Bank World Development Indicators (data downloaded 7/25/2018).

Note: Levels of education are defined according to International Standard Classification of Education 2011. Intermediate education is upper secondary or postsecondary nontertiary education. Advanced education is short-term tertiary education, a bachelor's degree or equivalent level, a master's degree or equivalent level, or doctoral degree or equivalent level.

variation across countries. In a few countries, the population with a secondary education remains low, including Burundi, Gambia, Mali, Niger, Rwanda, Senegal, and eSwatini. Zimbabwe even experienced a major decline in the secondary education share. But a few countries have achieved a very high percentage share of the population with a secondary degree (higher than 20 percent), including Botswana, Gabon, and South Africa, while Kenya achieved an exceptional increase over the last few decades.

Progress in Sub-Saharan Africa has been much more modest in tertiary education, with most countries starting from very low levels. For the 23 countries for which there are data, the average percentage of the population 25 years and older with a tertiary degree rose from 1 percent in 1985 to just 1.8 percent in 2010. Only Gabon and Kenya achieved rates higher than 5 percent by 2010. But large increases are likely in most countries in coming years.

At the same time, structural transformation has been limited in Sub-Saharan Africa. There has been a movement of labor from agriculture into services (such as information and communications technology and tourism) and into capital-intensive manufacturing. But low levels of complexity prevail, and some countries have experienced early deindustrialization.

Unemployment. There is no single pattern of unemployment in Sub-Saharan Africa.

For many countries without large increases in the supply of secondary education graduates and limited structural transformation, there are no major mismatches, and unemployment rates remain low (10 percent or less; see table 4, including Democratic Republic of Congo, Ghana, and Namibia). But for a few countries that experienced large increases in secondary education but limited structural transformation, unemployment rates are either high (10–18 percent as in Côte d’Ivoire, Gambia, Kenya, Mali, and Rwanda) or very high (25–26 percent, as in Botswana and South Africa).

TABLE 3
Percentage of population in Sub-Saharan Africa with secondary and tertiary education degrees, 1985 and 2010 (percent)

Region and country	Secondary education (percent of population ages 15 and older)		Tertiary education (percent of population age 25 and older)	
	1985	2010	1985	2010
Sub-Saharan Africa	6.1	13.1	1.0	1.8
Benin	3.5	17.8	0.5	2.1
Botswana	9.7	29.0	1.3	2.7
Burundi	1.2	4.9	0.3	0.6
Cameroon	6.8	15.3	0.2	1.6
Central African Republic	3.7	9.5	0.8	1.3
Congo, Dem. Rep.	7.4	12.6	0.4	0.8
Congo	8.3	6.6	1.4	1.1
Côte d’Ivoire	3.6	8.1	1.3	3.4
Gabon	8.1	23.2	3.2	8.1
Gambia	2.0	4.6	0.6	1.3
Ghana	9.8	18.5	1.2	2.1
Kenya	1.2	13.3	1.1	5.3
Lesotho	11.5	13.2	0.3	1.2
Mali	0.9	3.9	0.2	1.3
Namibia	16.8	16.2	1.7	1.5
Niger	1.1	3.4	0.3	0.7
Rwanda	1.6	6.2	0.2	0.6
Senegal	2.8	2.2	0.9	2.0
South Africa	4.8	53.9	0.2	0.5
eSwatini	8.0	5.4	2.7	1.0
Togo	5.7	9.2	1.1	1.8
Zambia	8.4	16.5	0.2	1.0
Zimbabwe	12.6	6.8	2.8	0.7

Source: World Bank Education Statistics Database (downloaded 7/27/2018).

There are also odd cases. Some countries have high unemployment rates despite a limited increase in the share of secondary education graduates (Congo and Senegal) or even a decline (Zimbabwe). At the other extreme is Benin, with a low unemployment rate of 6 percent but a very large increase in secondary education graduates (from 3.5 percent to 17.8 percent).

Unemployment rates for advanced education graduates remain relatively low in Sub-Saharan African countries. Many countries have experienced a significant increase in their ratios of

TABLE 4
Unemployment rates for people with completed advanced and intermediate education in Sub-Saharan Africa, 2010 or closest year (percent)

Country	With advanced education	With intermediate education
Benin	12.0	6.0
Botswana	6.9	25.0
Côte d'Ivoire	27.0	18.0
Congo, Dem. Rep.	11.9	6.7
Congo	19.2	23.4
Ghana	4.2	5.2
Gambia	0.0	15.0
Kenya	11.3	12.5
Mali	19.6	11.9
Namibia	5.5	10.2
Rwanda	11.6	10.4
Senegal	18.0	11.6
South Africa	6.9	25.9
Zimbabwe	6.7	13.6

Source: World Bank World Development Indicators (data downloaded 7/25/2018).

Note: Levels of education are defined according to International Standard Classification of Education 2011. Intermediate education is upper secondary or postsecondary nontertiary education. Advanced education is short-term tertiary education, a bachelor's degree or equivalent level, a master's degree or equivalent level, or doctoral degree or equivalent level.

graduates, but their levels remain low, and the countries have not experienced high unemployment rates: Benin, Cameroon, Lesotho, Niger, Rwanda, and Zambia. The exceptions are Mali and Senegal, with high unemployment rates (19.6 percent and 18 percent) even though the share of the population with advanced education remains low.

Three countries have achieved high ratios (greater than 3 percent) of higher education graduates (Côte d'Ivoire, Gabon, and Kenya), and unemployment rates are available for two of them. Kenya has been successful in achieving large gains in higher education and a low unemployment rate (11.3 percent). Côte d'Ivoire experienced a large increase in the advanced education ratio, from 1.3 percent in 1985 to 3.3 percent in 2010, and the unemployment ratio of advanced degree graduates reached 27 percent in 2012. However, this ratio declined significantly as the country's economy recovered.

Prospects for education and structural transformation in Sub-Saharan Africa

Educational attainment levels will likely continue to improve in Sub-Saharan Africa, as countries invest more in education guided by clearer priorities and enabled by better economic conditions that allow more resources to be allocated to education. For secondary education, the rapid increase since the 1980s will accelerate. For tertiary education, progress should be even greater as countries invest more, and increasing numbers of secondary education graduates aspire to a higher education.

On the other hand, the prospects for strong structural transformation are weak and uncertain in Sub-Saharan Africa. Debate is still ongoing about the best pathways to structural transformation. Industrial revolution 4.0 may preclude opportunities for following an export-led strategy, as East Asian did. One view argues that the largest potential is in agricultural transformation based on Africa's comparative advantage in unused arable land.⁷ Another view argues for a services-based approach, claiming that modern services, with characteristics similar to those of manufacturing, are the best path to structural transformation.⁸ These services are tradable, and benefit from high productivity, scale, and agglomeration economies, such as information and communication technology, tourism, transport, and agrobusiness. Still another view argues that the relevant approach should be balanced and based on agriculture, manufacturing, and natural resources as well as services.⁹

The prospects for large gains in educational attainment and the uncertain progress in structural transformation create the potential for large mismatches between the supply of and demand for skills. If such mismatches continue or become more widespread, they could lead to social tensions, political unrest, and strong international migration pressures.

The quality of education

The discussion so far has been based on quantitative measures of progress in the completion of

secondary and tertiary education. They do not necessarily translate into higher level skills, which also depend on the quality of education. Available measures of the quality of education and learning show that MENA and Sub-Saharan African countries trail well behind other regions.¹⁰

The disconnect between the quantity and the quality of education makes the problem of mismatch even more challenging. Young people who get a secondary or, especially, a tertiary degree have much greater aspirations than warranted by the level of skills they have acquired. The frustration in not finding a job that they believe is commensurate with their skills is thus greater and their desire to migrate may be stronger.

PRESSURES FOR EMIGRATION WITHIN AND OUTSIDE OF AFRICA

The history of migration from Sub-Saharan Africa in recent decades is consistent with earlier analysis that suggested increasing pressures for migration outside the region, particularly to Europe. The number of emigrants from Sub-Saharan Africa was fairly stable during the 1990s and then increased rapidly by 67 percent during

2000–17. While the propensity to emigrate from Sub-Saharan Africa was about equal to the world average in 1990, at about 3 percent, it declined to 2.4 percent in 2000. Despite the rapid increase in the number of emigrants since 2000, the propensity to emigrate continued to decline until 2010. But it has picked up recently and reached 2.5 percent in 2017, compared with 3.4 percent globally (table 5).

There is clearly potential for emigration to rise to the global average and even to surpass it as suggested by the factors discussed above. These factors apply unevenly across countries and sub-regions of Sub-Saharan Africa. This implies that some of the resulting outmigration may be within Sub-Saharan Africa. Indeed, the largest migration flows have been taking place within Africa.¹¹ In 2017, almost 70 percent of emigrants from Sub-Saharan countries were residing in other countries in the region. But this share, which exceeded 80 percent in the 1990s, has been declining in recent decades (see table 5).

The total number of emigrants who settled outside of Sub-Saharan Africa increased by 47 percent in the 1990s and by 100 percent during 2000–17. Their share of all emigrants has also been increasing

TABLE 5
Stock of emigrants from Sub-Saharan Africa countries, 2000–17

Number of emigrants	1990	1995	2000	2005	2010	2015	2017
Within Sub-Saharan Africa	12,990,998	13,679,671	12,025,153	12,371,061	13,260,302	17,652,590	18,709,739
Outside Sub-Saharan Africa	2,787,506	3,407,598	4,120,395	54,438,60	6,988,396	7,911,483	8,236,820
Total	15,778,504	17,087,269	16,145,548	17,814,921	20,248,698	25,564,073	26,946,559
Ratio of emigrants to Sub-Saharan Africa population							
Emigrants within Sub-Saharan Africa	2.53	2.32	1.79	1.61	1.51	1.75	1.76
Emigrants outside Sub-Saharan Africa	0.54	0.58	0.61	0.71	0.79	0.78	0.77
Total emigrants	3.07	2.90	2.40	2.32	2.30	2.54	2.53
Emigrants outside Sub-Saharan Africa							
Share in total emigrants (percent)	17.7	19.9	25.5	30.6	34.5	30.9	30.6
Share in Europe (percent)	59.4	57.9	56.7	56.3	53.6	50.7	50.6

Source: Calculations based on data from United Nations, Population Division, Workbook on Migration by destination and origin.

steadily. While in 1990 the ratio of emigrants of Sub-Saharan Africa who are outside the region to the total population was only 0.54 percent, it has been increasing and reached 0.77 percent in 2017. The share of the emigrants outside of Sub-Saharan Africa who are in Europe is greater than 50 percent.

There has been some slowdown in the increase in migrants outside of Sub-Saharan Africa since 2015 based on the official data shown in table 5. But it is likely that the official data underestimate the extent of migration to Europe. Other data show a dramatic increase in the last decade of migrants from Sub-Saharan Africa to Europe and the United States. Between 2010 and 2017, there was an estimated influx of 1 million asylum seekers from Sub-Saharan Africa to Europe.¹² There must also have been additional migrants who were refugees, students, or irregulars. This flow figure is much larger than the increase in the stock of immigrants (shown in table 5) from Sub-Saharan Africa to Europe of 423,000 people between 2010 and 2017. While this figure is a net increase and takes into consideration those who left Europe during the period, it is quite plausible that it underestimates the actual number of migrants.

The prospects for a potentially big surge in migration from Sub-Saharan Africa is also supported by surveys. A 2017 survey in six Sub-Saharan Africa countries (Ghana, Kenya, Nigeria, Senegal, South Africa, and Tanzania) finds that at least 4 in 10 respondents said that they would go and live in another country if they had the means and the opportunity.¹³ This ratio reaches its highest level in Nigeria (74 percent) and Ghana (75 percent). In addition, in five of the countries included in the survey, 20–44 percent of Sub-Saharan African respondents say they actually plan to move to another country within the next five years.

THE SPECIAL CHALLENGES OF THE SAHEL

The analysis has treated Sub-Saharan Africa as a single entity. But the factors that create incentives

for greater migration from the region to Europe do not apply in the same way for all countries and regions. The relative importance of the various factors varies, as does proximity to Europe. This is especially the case for the Sahel.¹⁴

Geographically the Sahel countries of Africa are closest to North Africa and Europe. For them, the lower costs of transportation to reach North Africa and Europe are an additional factor for increased migration. But, more important, the factors influencing the potential for migration are especially challenging in the context of the conditions in the Sahel countries. For instance, the size of the working age population is expected to increase by 120 percent during 2020–50 in Sub-Saharan Africa but by a staggering 165 percent in the Sahel.¹⁵ The Sahel countries are some of the poorest in Sub-Saharan Africa. The GDP per capita (in purchasing power parity dollars) differential with Europe and other advanced economies in 2015 was 92 percent for Sub-Saharan Africa and 95 percent for the Sahel.¹⁶

These demographic and income factors should generate extreme migration pressures from the Sahel countries to Europe, even though the third important factor of mismatches between the supply of and demand for skills may play a more limited role. The level and increase in educational attainment remain low in the Sahel, as does the extent of structural transformation.

On the other hand, the impacts of climate change in the Sahel are extremely serious and will add to the migration pressures. Droughts and extreme weather events, and high incidence of conflicts, are pushing hundreds of thousands, even millions, out of their traditional living areas to migrate to other regions and internationally. These factors compound those resulting from demographic, economic, and educational changes.

The propensity to emigrate from the Sahel countries, at 4.16 percent of the population in 2017, is much higher than for Sub-Saharan Africa overall, but it has been declining since the 1990s. More

than 93 percent of this emigration is within Sub-Saharan Africa. According to official figures, emigration outside the region is small but increasing. It is quite plausible that the underestimation of migration from the Sahel is quite large and that actual numbers of migrants are much higher.¹⁷

POLICY IMPLICATIONS

Economic pressures and incentives for migration from Sub-Saharan Africa to regions outside of Africa (and to North Africa), especially Europe, are likely to be strong over the next few decades, probably until the end of the century. Population numbers, income differentials, and the greater mismatch between expectations and reality in the labor markets, and the resultant social and political unrest, push in the same direction. In addition, higher incomes at the early stages of development favor an increased propensity to migrate, as people become capable of funding the high costs of migrating.

But these factors are not the only ones at work. Other factors may also magnify the potential for migration, such as the impact of climate change, conflict and violence fueled by poverty, extremism and ethnic tensions, and the volatility of incomes. These factors were not discussed in this study, but they need to be part of any strategic policy thinking about migration issues.

All over the world, including in Europe, the political environment and incentives are pushing in the opposite direction from those of demography, economics, and skills mismatches. Actual or perceived large migration flows are being used by populist movements in the political arena to push for a closing of borders and restrictions on migration. Some of the negative social and economic effects of migration are exaggerated, undermining rational discussion of these effects, which include potentially large benefits.

This makes international migration from Sub-Saharan Africa a major challenge requiring close attention and innovative thinking. Managing

these pressures and tensions should be central in both Africa and Europe. The current approach is in the interests of neither party. African countries are unable to benefit fully from their diaspora, including from remittances and transfers of knowledge and improved skills. Emigration may be biased toward the more skilled and educated population, limiting the growth of human capital in Africa. Europe has been pursuing dual policies on migration, encouraging and supporting migration of high-skilled workers while striving to restrict other types of migration. For instance, the European Union has been trying to engage in migration partnerships with African countries that are based mainly on controlling the flow of irregular migrants and facilitating their return to their countries of origin. Migration policy remains driven by short-term political considerations.

A new and long-term shared vision is needed between Europe and Africa on this great migration challenge and on how to better manage the large potential movements of people. Such a vision should include ways to deal with the challenge that are beneficial for both regions. The basic thrust of the vision and the associated agenda is to make it possible and desirable for the hundreds of millions of young Africans joining the job market over the coming decades to find better jobs and a better life in their countries and regions of origin. Achieving economic growth and structural transformation and providing better education and more attractive living conditions should be central to any strategy for Africa. The climate change challenge should be a major part of this shared vision, particularly in view of the alarming developments in the Sahel. Whatever success is achieved in economic growth and progress in Africa, increased migration flows are also still highly likely, and they need to be better managed. Ignoring them is not an option. It is in the interests of Europe and Africa to avoid irregular and chaotic migration flows and to facilitate safe, orderly, and regular migration.

The required policy actions and recommendations are especially relevant for the Sahel, where

the risks of chaotic emigration are greatest. While the volume of emigration from the Sahel to countries outside of Africa has been limited, this is changing rapidly, as shown by the recent flows of migrants through Libya and the Mediterranean trying to reach Europe. There are strong prospects for a surge in the flows of migrants caused by violence and conflict, the dramatic impacts of climate change, and other drivers of migration.

In Africa, policies and strategies that are in countries' own interests would help reduce migration pressures. These include strong policies and strategies to reduce fertility and better manage population growth, including policies to increase girls' education. During the next stage of development, Sub-Saharan Africa should focus education policies on secondary education and vocational training. The supply of skills should aim to match the requirements of structural transformation. Achieving strong and rapid structural transformation should be central to inclusive growth strategies, which are key to generating appropriate jobs for a rapidly increasing and increasingly educated working age population. Finally, countries should engage the diaspora in their development, by mobilizing their financial resources, their skills, and networks abroad.

Europe has a double responsibility. The first is to support African development strategies through trade openness to its exports, increased direct investment, and support for diversification and technology upgrading. This support should extend to helping countries, especially those in the Sahel and other fragile states, improve security and find ways of dealing with the consequences of climate change.

Europe also needs to develop more open and balanced policies for managed migration that take into consideration the relative supply of skills. Europe should not be attracting only highly skilled migrants. Its population and economic dynamics require a mix of skills, including semi-skilled and less-skilled workers, which require appropriate channels and mechanisms. Welcoming only high-skilled workers, which skims human capital from

Africa, is self-defeating, as it undermines development on the continent and increases the pressure for other types of migration. Europe should also invest and support the training and education of young people in Africa to generate the supply of skills that are in demand in Europe, which would mitigate the impact of the migration of skilled workers on the development of their countries of origin.

NOTES

1. These issues are discussed by UNCTAD (2018) and Davis and Muthumbi (2018).
2. During the three decades from the 2010s to 2030s, the declining total population growth (from 2.7 percent to 2.1 percent per year) will be significantly lower than working age population growth during this phase of the demographic transition (at 3 percent during the 2010s and 2020s).
3. See work by the Emerging Markets Forum in Kohli (2016).
4. Davis and Muthumbi 2018.
5. Kerr et al. 2016.
6. Bhorat et al. 2017.
7. ACET 2017.
8. Brookings Institution 2018.
9. Stiglitz 2017.
10. World Bank 2018.
11. Davis and Muthumbi 2018; UNCTAD 2018.
12. Pew Research Center 2018.
13. Pew Research Center 2018.
14. Guillaumont Jeanneney et al. (2016) provide a full review of the challenges and risks in the Sahel.
15. In these calculations the Sahel includes Burkina Faso, Chad, Mali, Mauritania, and Niger.
16. GDP per capita in each of the Sahel countries, except Mauritania, is more than 40 percent lower than the Sub-Saharan Africa average.
17. According to the data from the United Nations, the stock of emigrants from the Sahel countries who are outside Sub-Saharan Africa increased by 7,000 between 2010 and 2017. On the other hand, the data from the OECD database on migration show an influx to Europe from Mali alone for the period 2011–16 of more than 50,000. It is likely that these figures do not cover irregular migrants.

REFERENCES

- ACET (African Center for Economic Transformation). 2017. *Africa Transformation Report 2017: Agriculture Powering Africa's Economic Transformation*. Accra, Ghana.
- Bhorat, H., R. Kanbur, C. Rooney, and F. Steenkamp. 2017. "Sub-Saharan Africa's Manufacturing Sector: Building Complexity." Working Paper No. 256, African Development Bank, Abidjan, Côte d'Ivoire.
- Brookings Institution. 2018. *Foresight Africa: Top Priorities for the Continent 2018*. Washington, DC.
- Davis, J., and J. Muthumbi. 2018. "Intra-African Migration, Job Creation, and Structural Transformation." *Jobs Report*. Abidjan, Côte d'Ivoire: African Development Bank.
- Guillaumont Jeanneney, S., C. Anglely, A. Brachet, P. Guillaumont, B. Joubert, C. Laville, J. de Melo, S. Michailof, B. Miribel, O. Ray, and T. Zongo. 2016. *Linking Security and Development: A Plea for the Sahel*. Clermont-Ferrand, France: FERDI.
- Kerr, S.P., W. Kerr, Ç. Özden, and C. Parsons. 2016. "Global Talent Flows." IZA Discussion Paper No. 10328, Bonn, Germany.
- Kohli, H. 2016. *The World in 2050: Striving for a More Just, Prosperous and Harmonious Global Community*. Oxford, UK: Emerging Markets Forum.
- Pew Research Center. 2018. *At Least a Million Sub-Saharan Africans Moved to Europe since 2010*. Washington, DC.
- Stiglitz, J.E. 2017. "From Manufacturing Led Export Growth to 21st Century Inclusive Growth Strategy for Africa." ACET presentation at Cape Town, South Africa.
- UN (United Nations). 2017. *World Population Prospects: The 2017 Revision*. New York, NY.
- UNCTAD (United Nations Conference on Trade and Development). 2018. *Economic Development in Africa Report 2018: Migration for Structural Transformation*. Geneva, Switzerland.
- World Bank. 2018. *World Development Report 2018: LEARNING to Realize Education's Promise*. Washington, DC.



FOURTH INDUSTRIAL REVOLUTION, JOBS, AND SKILLS

Kapil Kapoor, African Development Bank
Hassanatu Mansaray, African Development Bank
Laura Sennett, African Development Bank
Oscar Pitti Rivera, African Development Bank
Antonio Ocana, African Development Bank

Background work carried out by experts at the African Center for Economic Transformation (ACET)

The study aims to identify the sectors with good job creation potentials in Africa and the methods of harnessing new technologies, particularly for sectors in which the continent has comparative advantage (for example, agriculture and light manufacturing). It assesses the level of awareness and preparedness of policymakers, as well as of technical and vocational educational training (TVET) systems in Africa in the context of the ongoing technological revolution. It discusses the policy and institutional reforms and investments likely to help absorb the millions of new entrants into the labor market each year. This involves reforms in educational and learning systems, support for 4IR enabling regulations and infrastructure, innovations, and public-private sector partnerships in technology upgrading and transfer. It also seeks to raise awareness among African governments, development partners, the private sector, and civil society organizations of the implications of the 4IR for job creation and skills development in Africa.

ABOUT THE FOURTH INDUSTRIAL REVOLUTION

Though developments in information and communication technology (ICT) have been key to ushering in the Fourth Industrial Revolution (4IR), the three previous industrial revolutions show that true revolutions—which usher in a paradigm shift in the way goods and services are produced and consumed, setting society onto a new technological path—are underpinned by developments in four domains: energy and power; transport, communications, and production and organization (box 1).

Jeremy Rifkin argues for the primacy of energy and power as the key drivers of an industrial

revolution, and argues that we are shifting to a Third Industrial Revolution that is being powered by a shift from the fossil-fuel-driven Second Industrial Revolution (oil/internal combustion engines), which had in turn replaced the First Industrial revolution, driven by coal and steam power.¹

Thus, though the agrarian revolution occurred several centuries before, the invention of steam power changed everything. Production technologies could be mechanized (mechanical looms), steam-powered printing presses lowered the cost of printing and saw the rise of newspapers (a key advertising medium), and steam-powered trains annihilated distance. This opened up grand new possibilities. Entrepreneurs were quick to reorganize production, setting up factories that

BOX 1

The four drivers of industrial revolutions

	Energy/power	Transportation	Communication	Production/industry organization
Agricultural Revolution (10,000 BC–1850s)	Animal power	Roads	Writing	Irrigation, crop rotation, new crops, breeding
First Industrial Revolution (1750s–1890s)	Coal, steam engine	Railway	Newspapers, telegraph	Factory, bureaucracy/professional management
Second Industrial Revolution (1890s–1940s)	Internal combustion engine, electricity	Motor car	Telephone, radio, television	Mass production
Third Industrial Revolution (1940s–1990s)	Jet engine, cheap oil	Aircraft, express motorways	Computing, Information systems	Automation (repetitive tasks), petrochemical industry (plastics, clothes, fertilizers etc.)
Fourth Industrial Revolution (1980s to present)	Distributed power (renewable energies, hydrogen fuel cells storage, smart grids)	Electric cars, autonomous vehicles (drones, driverless cars, etc.)	Internet technologies (WWW, email, social media, etc.)	AI/machine learning (automation of knowledge work), additive manufacturing (3D printing), digitization (digital products)

Source: Author's construct.

allowed economies of scale, thus making goods cheaper. Railways made markets accessible, and newspapers created awareness. It is the convergence of several technologies and business model innovations that really makes a revolution (box 1).

Energy and power were key prime movers of the First and Second Industrial Revolutions. The advent of computers can rightly be said to have spurred the Third Industrial Revolution given the impact they have had on production and communication capabilities. Indeed, information and communication have now become the prime movers. So, while the shift to renewable energy sources and to autonomous vehicles are key technological developments, they are also playing a crucial role in ushering in the Fourth Industrial Revolution. However, all 4IR technologies are undergirded by ICT, underscoring their primacy.

Dominant technologies

- *Processing technologies:* Computing power continues to be key as it enables new applications that were not possible due to limitations of computer power. Computer power has been doubling every 18 months (Moore's Law). However, the limit of computers under the current design is almost attained. New designs

are now emerging with quantum computing capabilities, the new frontier in computing. So, we expect the unrelenting growth in computer power to accelerate further, allowing more and more powerful applications to be built on top of it.

- *Machine learning/artificial intelligence (AI)/robotics:* Perhaps this is the aspect of technology that most defines the Fourth Industrial Revolution. AI is enabling machines to undertake task that were previously thought to be the domain of human beings. Much like humans, machines are now being enabled to learn and to continuously improve their capabilities. Significant milestones in this area include the first computer to beat a human being at the Go game. More recently, a machine has been able to do a better job of lip reading than a human expert.²
- *Internet communication and proliferation of devices linked to the internet—internet of things (IoT):* Computing and communication power are increasingly being embedded in all kinds of hardware and devices—televisions, refrigerators, coffee makers, security systems, and washing machines. Further, these devices are being connected to the internet. The internet of things (IoT) is this giant network of

connected “things” (which also includes people). Cisco estimates that the number of connected devices will double from 25 billion in 2015 to 50 billion in 2020.³ IoT allows for virtually endless opportunities and connections to take place, many of which we currently cannot even imagine.

- *Data mining technologies/data science:* This involves collecting information digitally through the proliferation of mobile devices, online sensors, and other means—that is, through IoT. This has seen the capture of vast amounts of data. When huge amounts of data are combined with powerful computing capabilities and AI algorithms, the insights generated are unprecedented. New businesses are emerging from these digital platforms, including sharing economy apps such as Uber and supply and demand matching services such as Airbnb, allowing for instant interaction, information exchange, and closer and broader collaboration.⁴
- *Blockchain or trust technologies:* Trust systems developed over a long period of time are being eroded as new technologies connect disparate peoples and disrupt existing technologies. Blockchain lets people who have no confidence in each other collaborate without having to go through a neutral central authority. Blockchain is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. Intermediaries like lawyers, brokers, and bankers, and even government bureaucracies might no longer be necessary. Simply put, it is a machine for creating trust.⁵ Moreover, blockchain technologies can cut the time transactions take drastically, from weeks or months to days, hours, or minutes. With blockchain, economies are poised to undergo a radical shift, as new blockchain-based sources of influence and control emerge.⁶
- *Renewable energy and related technologies:* The shift to a new energy regime is well under way. The 2017 World Energy Outlook points out that one of the defining trends is the rapid deployment and falling costs of

clean energy technologies.⁷ It forecasts that in the European Union renewables could account for 80 percent of new capacity as wind power becomes the leading source of electricity soon after 2030. In general, renewable energy sources (RES) are likely to be the least-cost source of new energy generation by 2040. However, for transition to an RES dominated energy regime, three technologies are going to be critical. These are generation technologies, storage technologies, and distribution technologies. The competitiveness of RES will be determined by the weakest link in the three technologies.

Impact of 4IR technologies

4IR technologies present challenges and opportunities. The key opportunities include improvements in productivity, and platforms for driving and unlocking new opportunities (and new jobs), and also increases in consumer surplus as cheaper goods are delivered. This surplus, if it drives demand for new services and thus entrepreneurship, and would-be growth enhancing. On the other hand, 4IR technologies may render many jobs redundant, especially middle-level jobs, and may also further entrench inequality by disproportionately rewarding owners of capital over owners of labor. This can dampen growth. These technologies are driving rapid changes that increase uncertainty and make it harder for both businesses and policymakers to plan.

Beyond these more immediate threats, 4IR technologies are likely to fundamentally change society:

- 3D printing technologies are pointing to the end of the factory model of production and maybe to the return to a form of cottage industry of the past.
- Industry boundaries are getting blurred by the day as technologies allow companies to venture into other industries. For instance, Google is developing autonomous cars, while Tesla, a car company, sees itself as an energy company.

- 4IR is redefining traditional notions of work. Work is what people do and not where they do it. Businesses will increasingly connect and collaborate remotely with freelancers and independent professionals through digital talent platforms.
- Digital platforms are upending assumptions that have underpinned economic policy. The sharing economy is moving from the concept of ownership to the concept of buying a service. Therefore, car companies are unlikely to sell cars in the future but rather offer a transport service.⁸ More important, internet technology platforms are allowing new forms of capital that are more valued than built material. For instance, the Couch Surfing service allows people to invite other to stay in their houses for free.
- 4IR is ushering in new economies, with implications for business management.

Technologies are enabling people to pursue different lifestyles and social capital is increasingly being valued more than material capital. Three key changes are shifts toward decentralized economies, the rise of sharing economies, and the rise of volunteering and social enterprise.

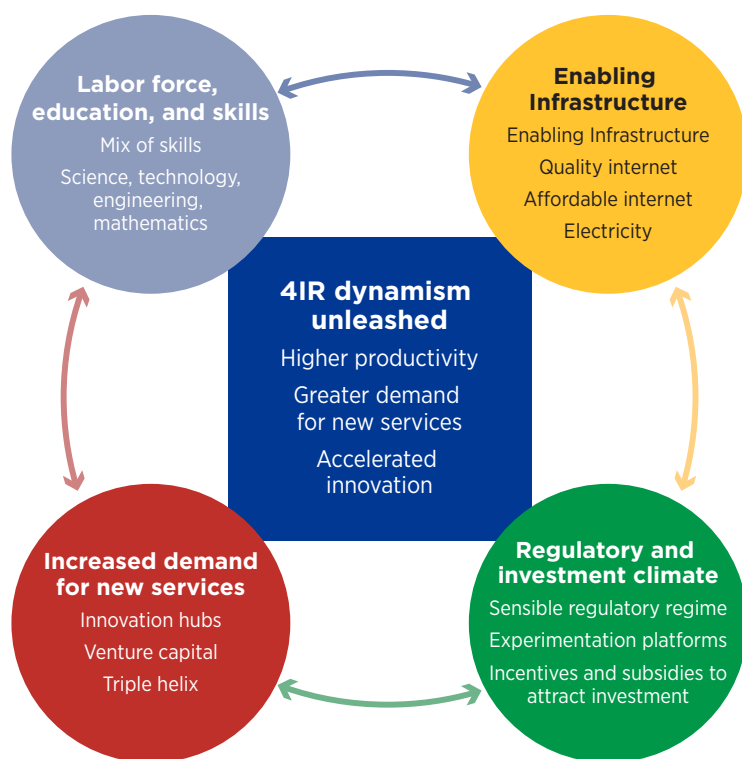
Many theologians equate human value with work (and leisure with sin) and also equate humanity with autonomy in decisionmaking. However, 4IR technologies are encroaching on these domains. They are replacing humans in the workplace and also increasingly making decisions on behalf of humans.

Conceptual framework

The study envisions four key areas or domains through which the impact of 4IR on job creation and inclusive growth can be achieved. The four domains characterized as the 4IR ecosystem (figure 1) are:

- *Labor force and labor market dynamics, and education and skills requirements.* The focus here is on two aspects: first, demographic and labor supply issues as well as the labor market dynamics, and second, education and skill development issues—access, quality, and relevance at all levels. These include technical, vocational education, and training (TVET), and apprenticeships and their alignment with the requirements of 4IR.
- *Enabling infrastructure* are those considered as the backbone for 4IR uptake. These are internet penetration, quality, and cost. With internet penetration, the focus is on: (a) coverage—fibre optic cables, broad band (3G, 4G, and 5G); (b) quality, speed, and reliability; and (c) affordability. These are fundamental in 4IR uptake. While power and energy are important, they are not unique to 4IR. The same can be said for transport. Power, energy, and transport are assumed to be givens, and not treated in this framework.
- *Innovations systems* refer to the types of technologies being employed and deployed, and

FIGURE 1
The 4IR ecosystem



Source: ACET formulation.



the supportive environments that facilitate uptake, scaling up, and commercialization.

- *The regulatory and business environment* tie the three domains together and they are the drivers that unleash the full potential of 4IR. The coordination and management of all four domains determine the nature and scope of the impact of the 4IR on productivity, job creation, and inclusive growth (figure 1).

The issues, challenges, and policy recommendations in all four areas are the focus of the rest of the report.⁹

LABOR FORCE CHALLENGES AND THE 4IR

Impact of 4IR on the African labor force landscape

The global impact of the Fourth Industrial Revolution on economies and, in particular, on jobs is an area of active research partly due to anxieties being raised, especially with regard to manufacturing. Findings from a review of the literature on the general impact of 4IR include the following:

- Highly pessimistic estimates of the impact of 4IR on jobs are being revised downwards, as the impact is becoming better understood. Early estimates put jobs susceptible to automation at 47 percent in the United States. Recent estimates foresee only 5–10 percent of jobs susceptible to automation, though for 60 percent of the jobs, at least 30 percent of the tasks can be automated.¹⁰ McKinsey’s latest estimate through to 2030 puts global job losses due to automation at 15 percent.¹¹
- Jobs are more susceptible to automation in developing countries, where jobs tend to be more routine and industries more labor intensive.
- Gains in productivity are expected, but hard to quantify. A recent estimate puts productivity growth between 0.8 percent and 1.4 percent globally.¹²
- The sector that is likely to experience the most impact in terms job loss is manufacturing.

- The focus of studies tends to be on robotics and automation; the impact of other 4IR technologies is given less attention.
- The likely impact on jobs is the loss of mid-level jobs. These are the jobs that make it worthwhile to automate given that robots are expensive and high-end jobs require skills that AI has yet to replicate. This polarization into low-paying and high-paying jobs is what is termed “lousy and lovely jobs.”¹³
- Loss of job security and other job-related benefits as on-demand jobs (part-time) and the “gig economy” grows.
- Though jobs will be lost, many new jobs are likely to be created as new industries emerge and as new ways of connecting people to opportunities are found. Bessen finds that computer use is associated with a 3 percent per annum job loss in manufacturing and a 0.3 percent per annum rise in national employment.¹⁴ Productivity growth in an industry tends to generate positive employment spill-overs elsewhere in the economy.¹⁵ Also, Mann and Putterman find that a one unit increase in new automation patents in the USA lead to a 0.20 percent increase in the employment-to-population ratio.¹⁶

However, the general impact may differ in Africa. Discussion of likely impact of 4IR in the African context includes the following points:

- Estimates of job losses in Africa need to be treated with caution. Very high estimates—for example, 85 percent of jobs in Ethiopia could be automated¹⁷—use the same methodology that found 47 percent of US jobs could be automated, revised down by others to 5–10 percent.
- Susceptibility is not inevitability. What is technologically feasible may not be economically feasible. Although the cost of robots is falling, there is a significant window of opportunity before they become feasible in Africa. Using the wage rate of a high-end robot—costing \$28 per hour—that can be used to make furniture, and assuming an annual decline in the cost of robots of 6.5 percent, (Overseas Development

- Institute) ODI finds that it will take until 2032 for robots to take over this sector in Kenya.¹⁸
- ODI finds that the impact on productivity in low-income countries is muted (9–10 percent lower) due to lower preparedness, particularly for lower-level skills. At the same time, the impact for Sub-Saharan Africa if all conditions are met is higher due to convergence effects.¹⁹
 - The manufacturing sector is very small in Africa, accounting for less than 7 percent of total employment. So, even though the sector might be more susceptible to automation, the impact of automation is small, except in terms of loss of potential jobs as the low-cost labor advantage is no longer a factor.
 - Polarization is already a reality where a small formal economy operates beside a large informal economy. 4IR may hasten formalization through new platforms and applications—for example, mobile payments—that increase efficiency and also create new types of jobs.
 - Emerging economies may see a rise in middle-wage jobs in services, construction, and so on, as the middle class grows and fuels demand.²⁰
 - 4IR technologies are likely to increase opportunities to find “gigs” (short-term jobs), the way of life for many in the informal sector. 4IR technologies are likely to increase opportunities by providing new platforms to find “gigs.”

In summary, the potential is huge for 4IR to help transform Africa economies and unleash new opportunities. This transformational impact needs to be given more attention.

4IR may pose some challenges for achieving the sustainable development goals (SDG) of creating decent jobs. Various scenarios were developed and growth rates imputed for a productively employed workforce using the 2030 horizon and meeting Sustainable Development Goal 8 (SDG 8). The main requirement would be a GDP growth rate of 11.3 percent by 2030. This is because, going into the 2018–2030 period, there are already 300.6 million jobs and an additional 342.2 million—or 26.3 million per year—are needed by 2030. This target is highly unlikely to be met. Adjusting the

elasticity to 0.7 reduces the target growth rate to 8.4 percent—still very ambitious. This underscores the challenge of meeting the SDG targets. Alternatively, a scenario that keeps employment growth at the current rate (3.1 percent) requires a more realistic growth rate of 6.12 percent by 2030, but at the price of an additional job loss of 104 million working poor.

The above rough estimates assume that economic growth is translated into productive jobs with maximum efficiency. That would require not only an ideal sector composition of growth, but also optimal sector-specific employment elasticities. In practice, this is likely to be far from the case. It can be safely concluded that sector heterogeneity—in terms of each sector and sub-sector share of and contribution to growth of value added and employment, respectively—deserves at least as much attention as aggregate economic growth rates.

4IR and the demographic dividend

Africa is yet to experience the demographic transition that propelled rapid economic growth in East Asia by expanding the working age population and simultaneously decreasing the dependency ratio. Population growth rates since 2005 have been hovering around 2.5–2.6 percent annually, almost doubling the continent’s population during the period. Thus, education and skills challenges in Africa are exacerbated by the unabated demographic headwinds. In East Asia, in addition to inclusive transformative policies, savings generated by the demographic dividend enabled increased investment in primary, secondary, and technical education, and skills development. Thus the impact of the dividend was huge. Bloom et al attribute a full one-third of the Asian growth miracle between 1975–2010 to the demographic dividend experienced in the region during the period.²¹ For Africa, Ngom notes that the demographic dividend could result in an additional \$500 billion worth of growth per annum over a 30-year period.²² Positive growth effects of a demographic dividend in Africa are also predicted by Bloom et al.,²³ IMF,²⁴ World Bank,²⁵ Ashraf et al.,²⁶ and Canning et al.²⁷

But to maximize the benefits of the demographic dividend, the Sub-Saharan Africa region will have to create high-productivity jobs at a fast pace—an average of about 18 million jobs per year until 2035—in order to absorb new entrants into the labor force.²⁸ This is six times the current rate of job creation, which is 3 million jobs per year.

Thus, while achieving a demographic dividend is within reach, the demographic transition in Africa has been slow. To be sure, a few countries have progressed considerably (for example Tunisia), with fertility rates that are below replacement levels, but the majority of African countries in the past decade are demonstrating surprising delays in the transition. Some countries are showing very little movement along the natural transition and are stuck at very high fertility rates.²⁹ In 2015, the average total fertility rate (TFR) was still 4.6, and much higher at 5.3 in West Africa, 5.2 in Central Africa, 4.5 in East Africa, 2.9 in North Africa, and 2.3 in Southern Africa.³⁰ A lower TFR means that the working age population increases while capital dilution is reduced. A one percent increase in the working age population results in a 1.4 percent increase in GDP.³¹ Fewer children enable greater female labor force participation, more income invested in education, and rising retirement income.

Achieving a demographic dividend is, of course, not automatic—it requires strong policy support. Primary among conducive policies is that the economy must create sufficient productive jobs,³² which requires strong and sustained growth, estimated to be in the range of 8–9 percent per year.³³ Policies should favour labor-intensive sectors and sub-sectors. Agriculture and agroprocessing, wholesale and retail trade, and tourism are particularly good candidates relative to their current growth rates and their economy-wide (infrastructure) or multi-sector (tourism) multiplier effects. Clearly, the significant inclusive growth required to harness the demographic dividend means that transformation of Africa's economies is crucial. Furthermore, sustained encouragement of voluntary Planned Parenthood should be a priority. The World Bank recommends a strong focus on the

BOX 2

Modeling the impact of 4IR on Africa's labor market landscape

In general, 4IR has significant potential to increase productivity, especially in the most dynamic sub-sectors of agriculture and services. However, higher agricultural productivity may entail fewer jobs as the sector becomes upgraded. On the other hand, jobs are likely to be created in a modernized services sector, although mostly at the low end—for example, delivery jobs generated by e-commerce—but still better than subsistence work in agriculture.

Job creation will hinge on whether 4IR will accelerate aggregate demand faster than it can accelerate productivity. At the current employment growth rate of 3.1 percent per annum, for every 1 percent gain in productivity, aggregate demand has to rise by a further 1 percent to keep the job growth rate from falling.

Beyond aggregate demand and productivity pathways, 4IR can also increase the participation of previously excluded people, especially women, youth, and people with disabilities. 4IR technologies can allow people to work from home—which is beneficial for women raising children—and to look for occasional or part-time jobs. Simulations have been done based on a model described in the annex. The modeling results point to a rise in jobs as 4IR effects diffuse in the economy. However, productivity gains in the longer run are likely to come at the expense of productive middle-level jobs and, while 4IR is likely to bring an increase in jobs overall, especially higher-level jobs, it will exacerbate inequality.

The potential for 4IR to increase employment has been supported with evidence. Banga and te Velde find that Kenyan firms with internet are more productive and have a higher share of skilled workers.¹ However, job growth is not significantly different for firms with and without the internet, indicating that digitalization has not led to substitution of labor in Kenya. It seems that 4IR technologies may be unlocking hidden potential in firms by allowing them to increase productivity while also increasing jobs.

Note

1. Banga and te Velde 2018.

education of girls and women, as well as higher labor force participation by women, as these highly correlate with lower fertility rates.³⁴

AWARENESS AND PREPAREDNESS FOR THE 4IR

The data used in this section are derived from an administered survey questionnaire and focus group discussions, and provide an analysis of responses on two key issues: (a) level of awareness and deployment of key 4IR technologies; and (b) the level of preparedness by key stakeholders. The respondents included directors (mainly from public sector institutions), academics (mainly heads of departments), analysts, ICT experts, and representatives of various industries. The data presented in the analysis cannot be generalized to the entire populations of the countries. This is simply a case study of randomly selected individuals in each of the 11 selected countries.

Level of awareness and deployment of 4IR technologies

Among the respondents, the level of awareness of 4IR technologies is generally high. Fifty percent or higher of respondents expressed moderate to very high awareness of all five 4IR technologies/innovations covered in the survey. 3D printing and blockchain were the least familiar among respondents, although moderate to very high awareness exceeded 50 percent. Respondents were of the view that the technologies are likely to have a profound positive impact on jobs. In both the survey and focus group discussions there was clear appreciation of these technologies. Though some responded may not have understood the associated technical jargon, they were aware of applications using these technologies. In the focus group discussions, however, most policymakers demonstrated low awareness.

Focus group discussions and survey respondents revealed that 4IR technologies are being deployed and respondents anticipated higher deployment in the near future. About 25 percent of the survey respondents indicated that 4IR technologies are being deployed in their sectors and about 33 percent indicated that there are plans to deploy 4IR

technologies (figure 3). Big data and internet of things (IoT) were the top technologies being deployed, while Artificial Intelligence (AI) and robotics were the technologies most are planning to deploy. The high no-response rate in the deployment (42 percent) and future deployment (49 percent) should be interpreted as reflecting limited understanding of the application of these technologies and may indicate that awareness may not be as high as indicated by respondents.

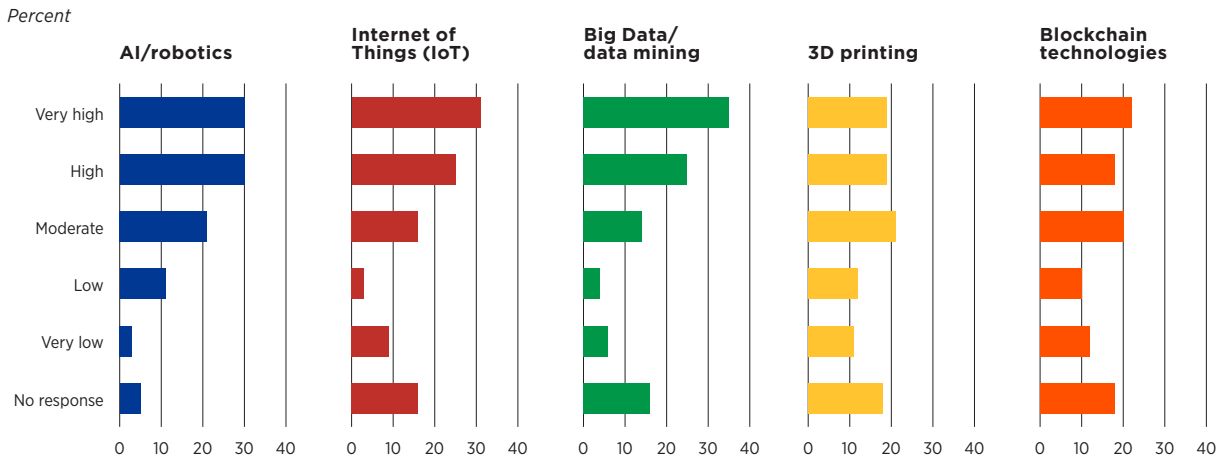
The range of applications being deployed is quite broad, as shown Table 3.1. This underscores the versatility of 4IR technologies and also that many are mastering these technologies. It also shows clearly that much innovation is already happening and that people are exploring interesting ways to use 4IR technologies. One application that stands out in particular due to its focus on the youth employment challenge is the Harambee project in South Africa.

The scope for deployment of 4IR is broad and opportunities are numerous. This perhaps explains the finding of a very positive perception of the impact of 4IR on jobs in Africa (figure 4). This is in contrast to the perception, especially in developed countries, that 4IR is likely to lead to job losses. A majority of survey respondents felt that 4IR presents an opportunity. Only 16 percent of respondents felt that 4IR would have a negative impact on jobs. The sectors seen as effected most positively are software development, ICT, and infrastructure. This is to be expected, as 4IR will create demand for jobs in these sectors. However, agriculture, finance, manufacturing, retailing, and tourism are also seen as benefiting from 4IR, while the informal sector is seen as deriving the least benefit from 4IR technologies.

The internet of things (IoT) and big data are the technologies seen as having the most positive impact on jobs and AI as having the least positive impact, perhaps a reflection that AI is associated with automation and thus job losses.

Many survey respondents and focus group participants were very optimistic about prospects in

FIGURE 2
Awareness of 4IR technologies



Source: ACET Field Survey.

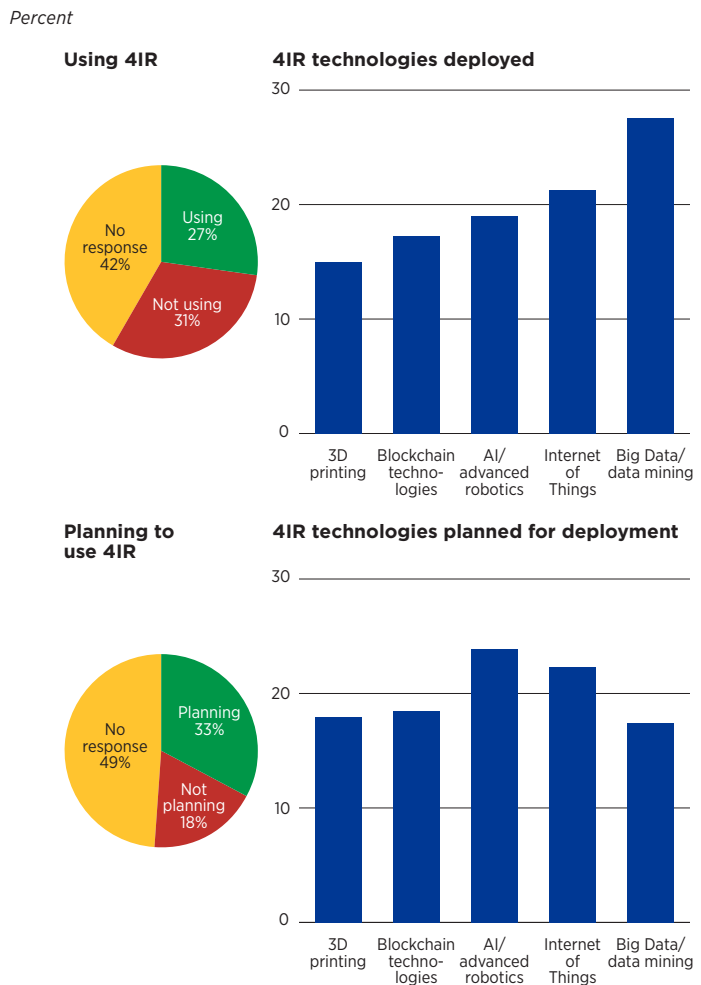
the 4IR world. However, many also felt that Africa’s private sector may not be able to take advantage of opportunities as many businesses are not prepared for the competitive landscape that will come with 4IR. The biggest threat is seen as coming from new entrants to existing industries. For example, the taxi industry has seen the entry of new companies that have rapidly disrupted the sector in ways that incumbents in other industries can expect.

Preparedness in sectors and sub-sectors

The survey points to low levels of preparedness for 4IR technologies in the countries surveyed. Over two-thirds of respondents demonstrated moderate to very low levels of preparedness with regards to the five key 4IR technologies. Respondents were least prepared for artificial intelligence/robotics and blockchain technologies (figure 5). This is consistent with the low level of awareness of these technologies (shown in figure 3).

Business preparedness is weak. The key challenge for business expressed by respondents was lack of leadership and inability to develop effective digital strategies (figure 6). Workers lacking requisite skills and mindsets and the general lack of skills in the job market are other major reasons given for the inability to compete. Perhaps the biggest

FIGURE 3
Current and planned deployment of 4IR technologies



Source: ACET Field Survey 2018.

challenge that 4IR innovations bring to African economies is the potential for disruption of some local businesses as new competitors from abroad enter the landscape enabled by 4IR. The taxi industry is an example. The perceived level of threat among respondents is high to very high—over 60 percent (figure 6); 65 percent of the source of threat comes from the entry of new players, for example Uber, Airbnb, and Hellofood, which are now disrupting the taxi, accommodation, and restaurant businesses respectively. Foreign businesses are not only entering the market and importing successful models from elsewhere, but they are also buying out local innovative firms, especially start-ups, at bargain prices.

Education and skills preparedness are weak. Survey respondents and focus group discussants affirm the education system's lack of preparedness of at all levels to deliver on 4IR innovations. The primary and secondary school systems are seen to be the least prepared, while TVET and university institutions are considered better aligned with 4IR innovations. Efforts being made to overcome some of the challenges at the primary and secondary levels include providing laptops to children, introducing e-learning platforms and blended learning (combined traditional and online learning) platforms, using computer games for learning, and accessing online learning resources. The Khan Academy is an example.³⁵

Opportunities offered by 4IR will remain unrealized until the education system and skills development programs are ready to respond to the demands of 4IR technologies. Africa is not yet ready on all the fronts needed to create a vibrant 4IR ecosystem. Thus, productivity gains from the application of 4IR are unlikely to be realized soon by African economies. More important, potential businesses and thus jobs that could be created from commercialization of innovations built on 4IR platforms will not materialize promptly. The situation is made worse because policymakers are the least aware of 4IR technologies. So, getting countries ready for the Fourth Industrial Revolution is an urgent matter.

TABLE 1
Examples of current and planned deployment of 4IR technologies

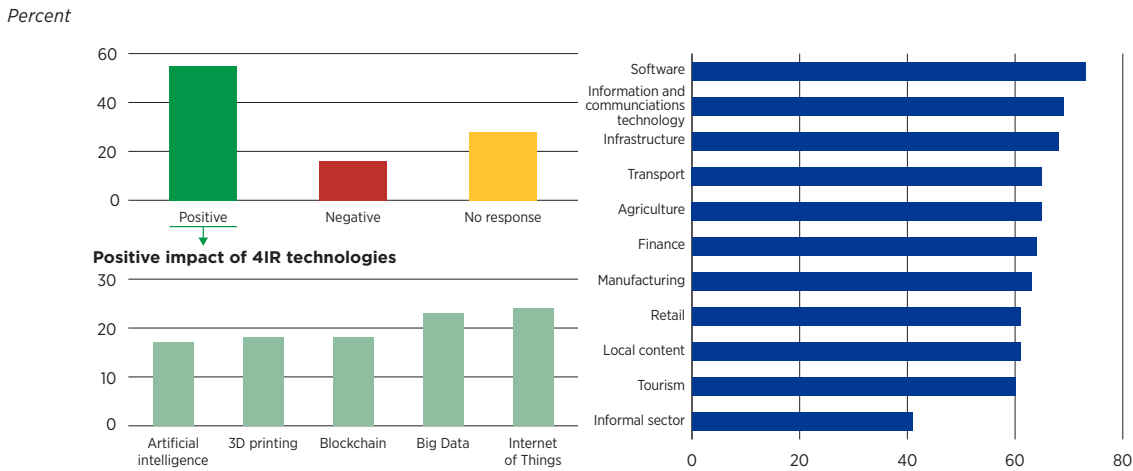
Application of 4IR	Country
Big data analytics being used in economic forecasting, monitoring, and to improve policymaking	Ghana, Egypt
Use of smart boards and Amazon Echo for teaching and demonstrations	Ghana
Use of 4IR to monitor eye movement of mine equipment operators to check for fatigue	Ghana
Mobile banking apps to connect customers to various services	Senegal
Robust anti-money laundering and counter-terrorism financing (AML/CFT)	Senegal
Use of social media applications such as WhatsApp for orders	Senegal
Use of AI and blockchain for solutions against cattle rustling	Senegal
Use of IoT to predict and manage energy supplies	South Africa
Use of drones for transportation	Rwanda, South Africa
Use of drones for inspecting mine sites	South Africa
Use of big data in credit risk scoring	Rwanda
Use of big data in climate analysis and prediction	Rwanda, Senegal
Use of big data in predicting customer future behaviour and improving customer service	Rwanda, Gabon
Use of big data in precision agriculture and improving yields	South Africa, Rwanda, Senegal
Fabrication using 3D printing	Rwanda, Egypt
Facial recognition in census counting	Rwanda
Smart city sensors	Rwanda
Transferring land using blockchain	Rwanda
Deployment of blockchain data integrity platform to guarantee security of data stored in cloud and allow more sensitive data to be moved to the cloud	Senegal
Central inventory tracking	Egypt
E-governance and open data	Gabon
Job placement, especially for at-risk youth	South Africa
Central inventory tracking	Egypt

Source: ACET Survey 2018.

4IR ECOSYSTEM

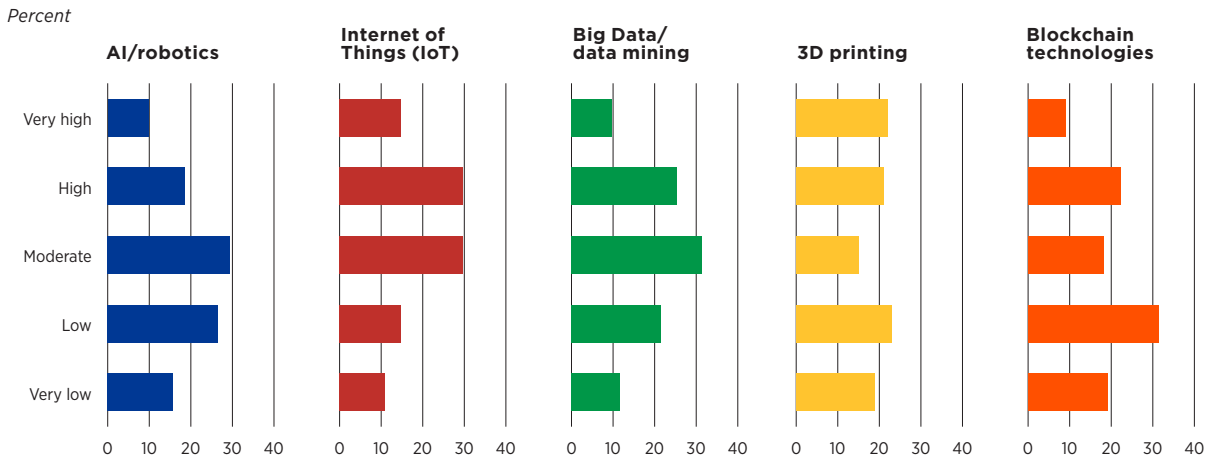
Making Africa economies ready for 4IR is more than just acquiring the technologies. It requires planning and building an effective ecosystem and policies and strategies to drive the system. This section provides some insights into the issues, policies, and strategies that can be gleaned through the four lenses of the 4IR ecosystem presented in conceptual framework section. This section

FIGURE 4
Perceived impact of 4IR on jobs



Source: ACET Field Survey 2018.

FIGURE 5
Preparedness for 4IR technologies



Source: ACET Field Survey.

discusses sectoral transformation strategies for job creation and their adequacy in the context of 4IR. The discussion draws on African Development Bank interventions as well as work undertaken by other agencies such as ODI, McKinsey, the World Bank, and World Economic Forum.

4IR ecosystem

To improve the level of awareness and preparedness of African economies for 4IR uptake, concerted efforts are required in following four domains: (a) education and skills development;

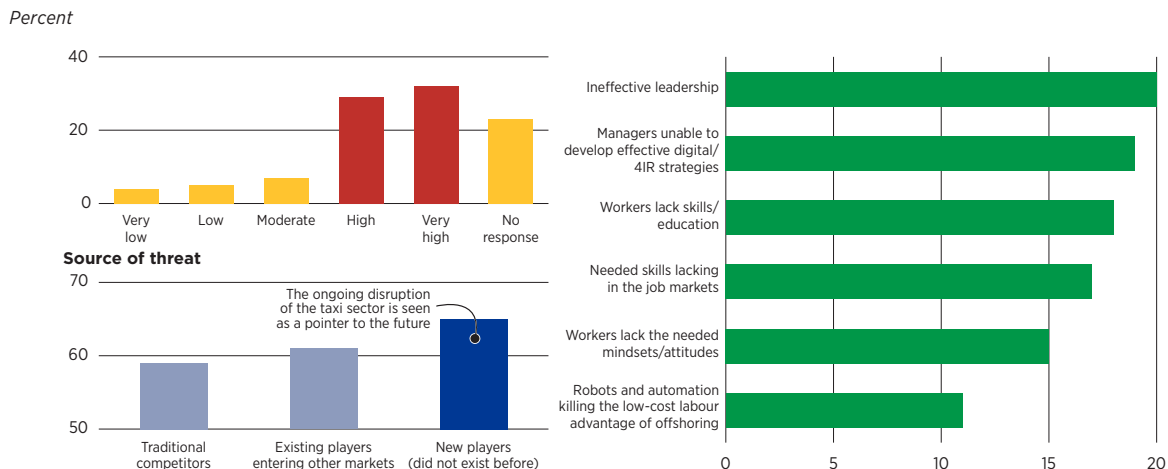
(b) 4IR enabling infrastructure; (c) developing and strengthening innovation systems; and (d) developing effective regulatory frameworks and enhancing the investment climate. These four domains, when well defined and supported, are expected to unleash the full benefits of 4IR innovations on the continent.

Education and skills development

To increase the impact of 4IR, relevant education and skills are needed. ODI finds that in Kenya, companies with higher internet penetration (a

FIGURE 6

Business preparedness for 4IR



Source: ACET Field Survey 2018.

proxy for 4IR integration or digitization) have a higher share of skilled workers and higher productivity. A skilled workforce cannot only increase the impact of technological progress on productivity, but this impact is also found to be higher for low income countries.³⁶

Cirera finds that inadequate education can lower the capacity of firms to transform knowledge into innovation.³⁷ Thus, a highly educated work force is key to leveraging 4IR innovations. As noted from the survey, there is a rising “tacit knowledge” that facilitates adoption of new technology. Such embedded knowledge is partly a product of education. WEF argues that beyond STEM, which is the foundation of 4IR skills, other requirements are social skills, system skills (judgement), complex problem-solving skills, business and entrepreneurship skills, process skills (critical thinking and active listening), and cognitive skills (logical reasoning and creativity).³⁸

Thus, education and skills development policies should be aligned with efforts to create appropriate labor market conditions for the uptake of 4IR innovations. Key among these are:

- Policies to increase access, quality, and relevance of the workforce with the appropriate education and skills for emerging innovations.

- Policies that facilitate school-to-work transition (SWT) and apprenticeships to enhance the workforce capabilities for 4IR.
- Policies to support life-long learning.
- Policies to enhance the role of ICT in education delivery.

Policies to increase access, quality, and relevance of the workforce

Policies to improve access to education and skills development would vary by country. Beyond physical access (distance, facilities, human resource, and so on), which is a common challenge across countries, reducing cost can improve access. This includes reducing tuition fees in some countries and associated costs such as uniforms and transportation. Cash transfer programs have been shown to have a positive impact on attendance or completion. In India, a program that gave females access to a bike for school led to significant increases in attendance and proved to be more cost effective at increasing girls’ enrolment than comparable conditional cash transfer programs in South Asia.³⁹

Improving quality and relevance, particularly skill development, starts at an early age and is a cumulative process, such that foundational skills need to be mastered before more advanced skills can be

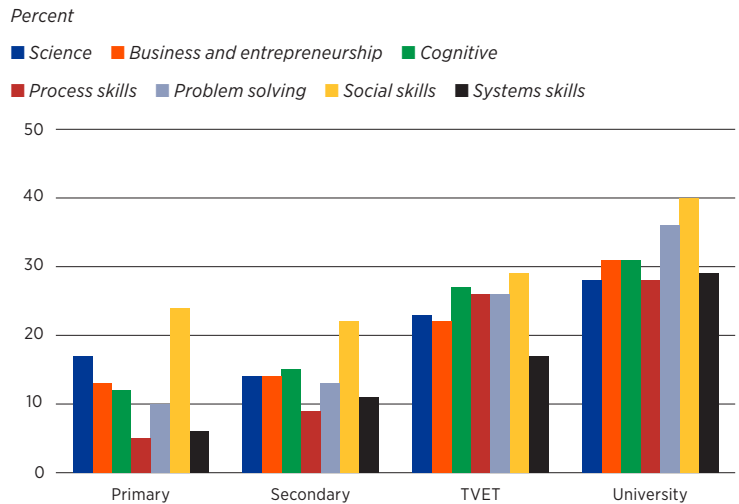
developed. This means that high-quality and relevant learning throughout the education system, as well as higher completion and access rates, are needed to produce a workforce with the advanced skills needed to make the most of 4IR.

The secondary education (including TVET) phase is crucial for the adoption of 4IR and economic transformation, because that is where young people develop higher level thinking and the technical skills needed to drive innovation, productivity, and jobs.⁴⁰ An increasing number of students will flow into secondary education as primary school completion rates continue to rise and the youth population expands. However, a large share of students who start secondary education lack good foundational skills and then struggle to make progress through secondary education systems.⁴¹ Sub-Saharan Africa has the lowest reading proficiency of all regions of the world—over 60 percent of its 15–24 year olds have low reading proficiency (figure 8). Though data for Northern Africa are grouped with those of the Middle East, the two regions combined show a much higher level of reading proficiency than the rest of Africa.

The focus of lower secondary education should be to ensure students learn good foundational skills for productive employment under 4IR. Good foundational cognitive skills, including basic STEM, ICT, and non-cognitive skills (including positive interpersonal and socio-emotional skills such as resilience, curiosity, and self-regulation) will be essential for all workers in the future labor market.⁴² Foundation skills are also important because they affect future labor market outcomes. They complement each other and are essential building blocks on which young people can develop more advanced skills.⁴³ They also enable people to adopt new technologies.⁴⁴ Entrepreneurial skills, which include good socio-emotional skills, will also be important for future work and should be fostered throughout the primary and secondary education phases.⁴⁵

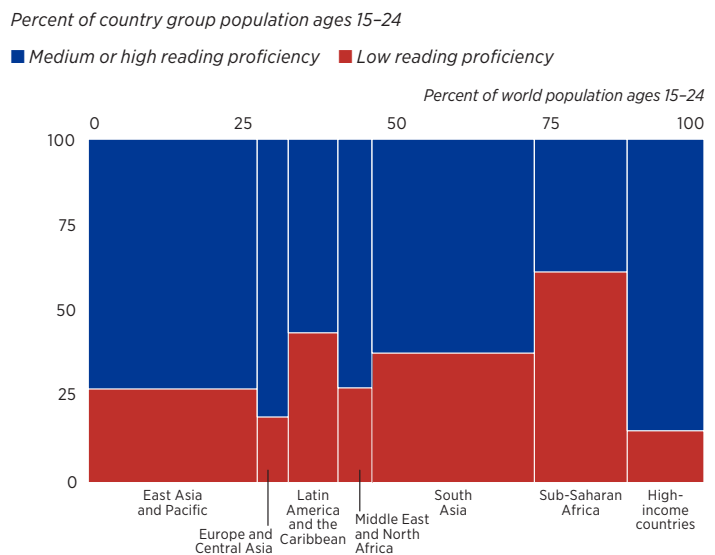
TVET should begin after lower secondary education so students have the core foundational skills

FIGURE 7
Education system preparedness



Source: ACET Field Survey 2018.

FIGURE 8
Estimated reading proficiency among youth 15–24, by region, 2017



Source: WDR 2018 team, using data from Larson and Valerio (2017). Data at http://bit.do/WDR2018-Fig_3-6.

needed to learn technical and higher-order cognitive skills.⁴⁶ Indeed, the general trend in Europe is toward TVET starting at upper secondary, and delaying the starting point for TVET has had a positive impact on education attainment.⁴⁷ For example, Poland delayed the starting point for TVET by a year so it started in upper secondary, which led

to an improvement in cognitive outcomes.⁴⁸ Many countries have also adjusted their level 3 vocational programs to contain a larger element of general education and more generic forms of vocational preparation, where the latter prepares participants for a cluster of occupations in a given sector rather than for a single one.

At upper secondary level,⁴⁹ the focus should be on developing good higher-order skills and increasing uptake of STEM skills needed for further study and work. Higher-order cognitive skills include STEM skills, learning, reasoning, critical thinking, entrepreneurial skills, and unstructured problem solving.^{50,51} Several African countries, such as Uganda, now include entrepreneurial skills in their curriculum.⁵²

Furthermore, high-quality learning depends on effective teaching, which is driven by teacher quality, prepared learners, learning-focused inputs, and effective management and governance that pulls them all together.⁵³ A skills strategy, including courses on offer from TVET institutions, should also link to priority sectors and include input from the private sector to help ensure students are learning relevant skills for future work. Embedding ICT literacy in the lower and upper secondary school curriculum requires more intensive training and a better supply of technology-inspired learning and teaching material. Box 3 shows examples of related innovative practices from select African countries.⁵⁴

School-to-work transition

Young students need support to transition from school to work as they often lack the skills, networks, and knowledge to find productive jobs.⁵⁵ Internships and easily accessible and up-to-date information on jobs can help. The informal sector also plays an important role in supporting school-to-work transitions by developing technical skills needed by the majority of workers. In Ghana 85–90 percent of skilled workers learned their trade in informal economy apprenticeships. Informal sector training is often more flexible than formal TVET, which is often characterized by rigid

admission criteria, operations, and training curricula. Quality apprenticeships include a mixture of classroom-based theory and practical learning, cover the latest technology use and application, and have well-trained master craftsmen who can teach a wide range of non-cognitive skills, not just technical skills. Policies should focus on improving the quality of informal sector training even while recognizing that policies are hard to enforce in the informal sector.

Policies to support life-long learning

Life-long learning will be key to ensuring workers skills match the needs of a rapidly changing labor market. In formal jobs, on-the-job training is relatively low in African countries.⁵⁶ Flexible pathways into and within the education system (including general education, TVET, and the informal, formal, and non-formal sectors) will be vital, but they often do not exist. For many, retraining or upgrading will need to come through short-term courses provided outside the formal sector. Programs, which should be designed with the private sector, could train young graduates in the skills needed in key sectors such as agribusiness. For example, Chile (fish and fruits) and Finland (forest products) have institutes to develop skills, solve problems, and prepare graduates for careers in product areas in which they have a comparative advantage.⁵⁷ Governments should focus on addressing market failures, such as limited information on potential returns, to investing in skills and imperfections in credit markets that limit access to training for disadvantaged groups.⁵⁸

Policies to enhance the role of ICT in education delivery

Technology can help African education systems to leapfrog, by improving efficiency, creativity, and access to learning opportunities. The evidence is still relatively weak in terms of the impact of each type of technology on education outcomes, but there is growing evidence that ICT integration has a multiplier effect through the education and training system,⁵⁹ as it can help to: (a) connect teachers to content; (b) give students access to education materials where teachers are unavailable;

(c) tailor learning to a student's needs;⁶⁰ (d) reinforce learning (such as with Eneza Education in Kenya that provides questions and answers to students via mobile phones); and (e) make learning more interactive and fun, which could improve learning outcomes.⁶¹ Digital technologies could also support the development of higher-order cognitive and socio-emotional skills.⁶² Technology could also drastically reduce the time it takes to update curricula (which often takes years) for pre- and in-service teacher training so that teachers and schools keep up to date with the latest pedagogical techniques.⁶³ ICT could also reduce the time it takes to update curriculum in secondary schools and TVET institutions, particularly in light of rapid technology advances.

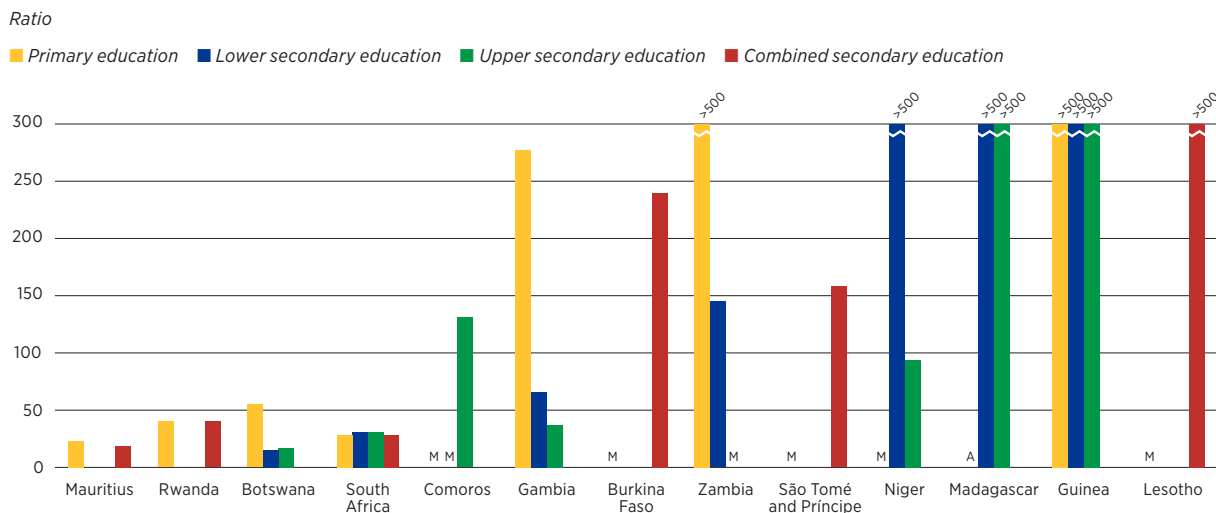
Technology can also drive efficiency by tracking and monitoring student outcomes. ICT applications are driving improved data collection and monitoring practices around the world. More effective educational management information systems (EMIS) that support data transparency and sharing within and between countries, can increase accountability and improved governance, which in turn can lead to better outcomes. For example, in Bridge International Academies, each

teacher gets an electronic tablet with scripted lessons, enabling head teachers and teachers to track the progress of each class as well as track teacher attendance.⁶⁴ Better access to data can also help teachers identify and resolve issues of individual student's progression more quickly.⁶⁵

On average, ICT use in education in the Sub-Saharan Africa is low and expansion is slow. Computer resources are particularly overstretched in countries such as Gambia and Zambia (figure 9). While no country has a particularly low ratio of computers to students compared to other regions, countries such as Rwanda and Mauritius have made relatively more progress than other countries in the region. Many countries have rushed ahead to invest in complex technological systems only to find that the physical infrastructure, teacher capacity, and resources are insufficient to support full operation or maintenance.^{66,67} The introduction of ICT has failed to improve outcomes where teachers fail to use and apply the technology to complement their teaching effectively.⁶⁸

Comprehensive strategies for the use of ICT in education are needed and should focus on building overall capacity, pedagogy, and training teachers to use

FIGURE 9
Learner-to-computer ratio, primary and secondary education, 2013



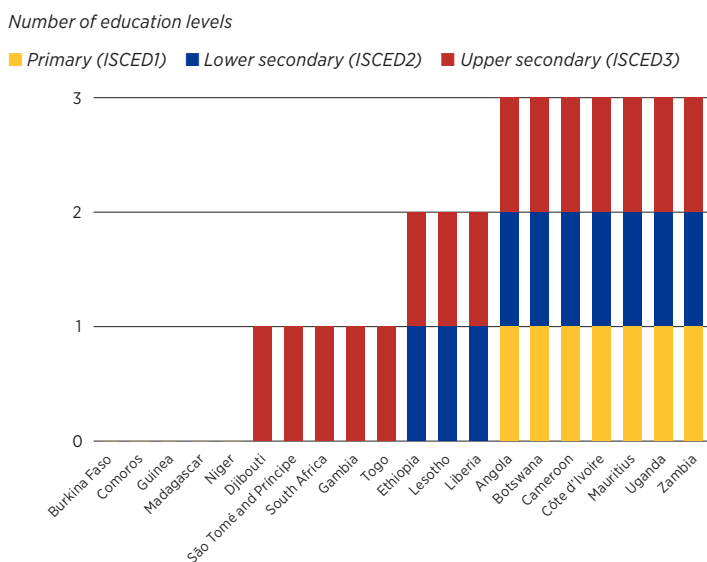
Source: UIS statistical database 2015, statistical table 3.
Note: M is missing data. A is not applicable. Data from Botswana reflect public sector schools only. Data for South Africa are for 2011; data for Botswana, Rwanda, and Zambia are for 2012; data for Gambia and Mauritius are for 2014.

and apply ICT to support teaching across subjects.⁶⁹ That means incorporating ICT use and application into teacher training and continual professional development that reflects the latest pedagogical techniques and ongoing technology changes.⁷⁰ It also means basic ICT and STEM literacy for all young students. Early integration of ICT into primary and secondary curricula should also be included in an ICT strategy,⁷¹ as it is an important lever to ensure students develop digital literacy. Several countries do

not yet include an objective or basic course in computing skills in their education or wait until lower secondary education to start (for example, South Africa), so more work needs to be done.

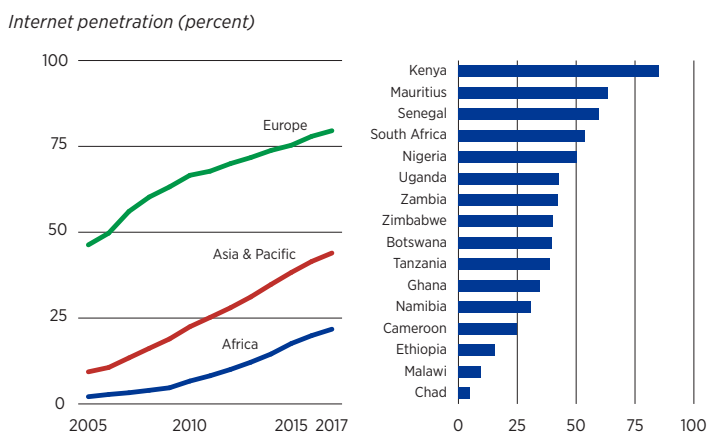
ICT interventions that boost capacity can be costly, but public private partnerships (PPPs) can offer innovative and effective solutions (figure 10). Any prospective policy should pass a cost benefit analysis before being implemented.⁷²

FIGURE 10
Education levels with courses in basic computing skills, selected Sub-Saharan African countries, 2013



Source: UIS statistical database 2015, statistical table 2.
Note: Education levels are from the International Standard Classification of Education (ISCED) 2011.

FIGURE 11
Internet penetration rates (IPR)



Source: International Telecommunications Union (ITU).

Enabling 4IR infrastructure

Internet penetration and cost are two key factors in 4IR-enabling infrastructure.⁷³ With regard to coverage, quality, and affordability, Africa lags behind all other regions. Data from International Telecommunication Union (figure 11) for the period 2005–2017, shows that Africa has persistently lagged behind other regions, both in the level and rate of penetration. By 2017, only 20 percent penetration in Africa, compared to about 45 percent in Asia and Pacific and 80 percent in Europe. Many areas simply remain unconnected, and even when connected to the internet, access is not easy. In Cameroon, Ghana, Kenya, and Uganda, more than three in four users still access the internet in commercial internet cafés, where high costs and slow connections limit use.

In addition to lower access to internet, African countries also suffer from poorer performance, with average download and upload speed significantly lower than in Asian economies. African internet users face longer delays in processing network data and pay much higher prices relative to their incomes.⁷⁴ This digital divide reflects inequality in access and is a barrier to productive use. The slow pace of internet penetration reflects shortcomings in policy and strategic direction, and is consistent with the low level of awareness of 4IR innovations among policymakers observed in ACET focus group discussions in the RMCs survey.

In their study of firms in selected African countries, Banga and te Velde, find that a doubling of the internet penetration rate increases labor

productivity by about 11 percent on average, emphasizing the crucial role of infrastructure.⁷⁵

Provision of key infrastructure for internet will largely be done by the private sector, but would require facilitative measures to enhance uptake. Increasing quality by rolling out 4G and 5G⁷⁶ networks is probably the low-hanging fruit for many countries as the mobile phone has the potential to replace broadband as the key internet vector. So, putting in place incentives to attract private sector investment is key. Such incentives must be well targeted, transparent, and properly aligned with country industrial policies. However, public investment will remain important especially where the private sector may be unwilling to go—for example, remote and marginalized areas. One example is Botswana's use of a universal service and access fund (USAF)⁷⁷ to increase wi-fi hotspots at hospitals, bus stops, and other public places.⁷⁸ Rwanda is another good example, where the state has laid over 2,500 km of fibre optic cables throughout the country, bridging the digital divide between urban and rural areas.

Although the internet is the key infrastructure, there are other requirements as basic as electricity, for example, which must be available for any 4IR device to run. These other investments will also need attention.

Innovation systems

As defined in the conceptual framework, a vibrant innovation system is vital, as the power of 4IR comes from innovations built on new platforms and their successful commercialization. Innovation systems are evolving rapidly with many dynamic and creative spaces where young entrepreneurs can meet and develop ideas and also meet potential investors. There are now over 442 active technology hubs in Africa, representing 41 percent jump from 2017 (figure 12), and there is over \$1 billion in venture capital investment in the pan-African start-up movement.⁷⁹ However, in focus group discussions in Kenya, participants complain that many start-ups have not been able to move beyond start-up stage and have instead become “perfect

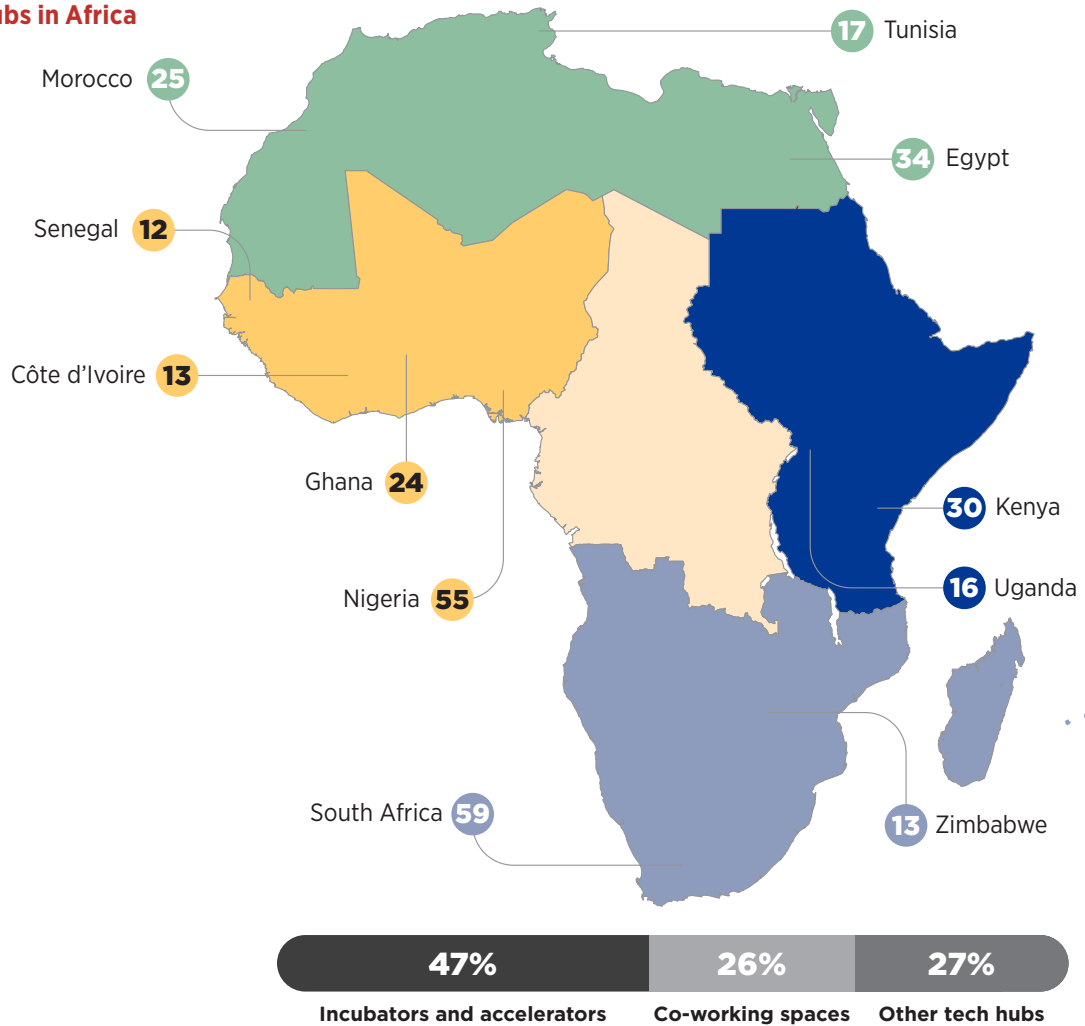
pitchers” that specialize in moving from one competition to another pitching for funding.

Having thriving innovation systems require collaboration between researchers, entrepreneurs (private sector), and policymakers. While researchers and innovators can create interesting solutions, it is the entrepreneur who turns an interesting idea into a business. The policymaker's role is both to see how best to fund research and also to support entrepreneurs by removing policy bottlenecks. This arrangement is called the Triple Helix Model, the building block of a vibrant innovation system being put in place. A number of African governments are beginning to coordinate and facilitate the development of innovation hubs, crowding in the private sector (box 3). But more needs to be done to support ideas, proof of concept, incubation, and intellectual property, and to move from experimentation to commercialization.

How innovators become businesspeople is going to be crucial, underscoring the need to develop the variety of skills mentioned earlier. For many start-ups, making the transition to sustainable business requires a different type of support than that received from hubs and incubators. This transition is happening as business accelerators are being set up. For example, Kosmos Innovation Centre in Ghana has an accelerator program that is driving the development of promising small businesses. Selected companies receive a range of support including capital investment and technical assistance aimed at helping them grow their businesses.⁸⁰ Another path for growth is when successful start-ups are bought by bigger businesses or investors. However, focus group discussions found that many start-ups are bought at a much lower value than they are worth, and they are also bought by investors from outside Africa. This points to the need to support indigenous innovators and strengthen intellectual property rights.

Collaboration between sectors is also being observed. This involves student internships, setting up laboratories in universities in collaboration with the private sector, and sharing data. However, there is

FIGURE 12
Tech hubs in Africa



Source: GSMA 2018 (<https://www.gsma.com/mobilefordevelopment/programme/ecosystem-accelerator/africa-a-look-at-the-442-active-tech-hubs-of-the-continent/>).

still much to be done, especially in creating an environment where there is cross-pollination of ideas and also co-creation across academia, industry, and policymakers. Progress is also being made in better connecting ideas to financing, as focus group participants from South Africa observed. However, our survey indicates that there is much distrust among the key parties (30 percent), and underscores the challenges of fostering effective collaboration. Other issues highlighted in focus group discussions were lack of shared vision (36 percent) and lack of funding for the platforms (31 percent). There is clearly much work to be done in setting up effective platforms for developing proofs of concepts.

Regulatory and investment climate

While making it easier to do business and improving the investment climate are normal industrial policy pillars, they are even more crucial with regard to the 4IR. This is because the technologies are new and regulatory authorities, which tend to be conservative and also understaffed,⁸¹ may not be nimble enough to develop needed regulations, or they may create stifling regulation based on poor understanding or unwarranted fears. For example, Kenya, which has otherwise been at the forefront in creating a conducive regulatory framework for 4IR that has seen the development of the most dynamic

BOX 3

Examples of technology hubs—Rwanda and Kenya

Across Africa, governments are establishing science and technology parks to foster innovation through closer collaboration between research and industry. Rwanda is at the forefront. The government in 2016, launched its flagship \$1.9 billion digitalization project that aims to leapfrog Rwanda into 4IR. The Kigali Innovation City (KIC) is a dynamic ecosystem of technology clusters that has universities and industry collaborating closely, with government support. Companies domiciled at KIC are expected to innovate and deliver products and services for global markets. Carnegie Mellon University and the African Institute for Mathematical Sciences are already operating in KIC, and they are in partnerships with existing educational institutions such as the International Centre for Theoretical Physics. This network is expected to contribute to creating a critical mass of engineers, mathematicians, and scientists who will be the heart of innovation and human capital development. A leading technology company, Ericson is also a member of KIC.¹

Kenya has established the Kenya National Innovation Agency (KENIA) with a core mandate to institutionalize linkages between universities, research institutions, the private sector, government, and other actors, and thus create innovation systems.

Note

1. Tumwebaze 2016.

Source: <http://www.innovationagency.go.ke/index.php/networking>.

mobile banking landscape, has been fairly erratic in the development of drone regulations. This has been driven largely by fear of drones being used by terrorists. First, Kenya temporarily banned drones, then recently introduced punitive regulations, charging exorbitant fees for the use of drones.⁸²

However, prolonged inaction has been a bane rather than a blessing, as manifested by the widening digital divide. Thus, governments must invest in building the capacity of regulatory agencies to increase awareness and understanding of 4IR, as survey results point to a low level of awareness among policymakers of 4IR technologies and their potential applications. However, some governments are taking experimental approaches to help increase understanding. For example, South Africa's Reserve Bank is adopting a Sandbox environment⁸³ that will allow experimentation with blockchain technologies in the banking sector to better understand them and thus devise an appropriate regulatory regime. Further, country-specific studies

exploring in-depth 4IR ecosystems for each country would be needed. This was a request made by policymakers who were focus group discussants in the ACET survey. Rwanda is a good benchmark with supportive regulatory reforms, which have quadrupled new firms from 700 to 3,000 per year.⁸⁴

Tax incentives can also spur investments in 4IR technologies and business. Most equipment for 4IR will be imported as few countries in Africa manufacture any. To increase access to ICT, both Kenya and Rwanda consider ICT equipment as capital goods, zero rated for customs duties. Rwanda has also reduced corporate tax from 30 percent to 15 percent for ICT investors.⁸⁵

INCLUSIVE TRANSFORMATION STRATEGIES

Creating decent jobs requires policies and strategies that increase productivity and labor absorption,

and enable the reallocation of labor from traditional to modern jobs and sectors. The preceding section presented an overview of the four domains of the 4IR ecosystem defined in the conceptual framework. It analysed the challenges and cited examples of ongoing efforts and programs and offered some policy recommendations. This section makes suggestions regarding sectors with potentials for job creation through transformative inclusive strategies to take advantage of emerging 4IR innovations. Five key pathways are reviewed below:

- Transforming agriculture.
- Modernizing the services sector.
- Exploring opportunities in export-oriented manufacturing.
- Harnessing the full potentials of tourism.
- Supporting the emerging creative industry.

These five pathways or sectors were selected for review because of their perceived potential for job creation, productivity growth, and the likely positive impact of 4IR on the growth of the sectors. There are other sectors—such as energy, power, transport, and construction—which are not reviewed in this study because of their limited job creation potentials and because they are already witnessing significant disruptions through digitization and automation.

Transforming agriculture

Modernizing agriculture can create jobs through two pathways: First, by raising productivity, it stimulates agroprocessing sectors by lowering the cost of raw materials, thus creating jobs in a much larger agroprocessing–agroindustry sector. Second, raising productivity also means upgrading value-chain activities—logistics, input services, storage, and so on—and stimulates a much larger agribusiness sector. Expanding employment in off-farm activities provides many productive jobs. Investors, such as input dealers and commercial farmers, can be incentivized to expand their operations and thus expand employment.⁸⁶

As agriculture commercializes on a larger scale, in order for farms to meet time-sensitive delivery

schedules with specific quality requirements, the need will grow for specialized trucking services, including refrigerated trucks. This will provide employment opportunities for drivers, packers, quality inspectors, and other occupations.⁸⁷

A more productive agriculture sector is also more attractive and will draw young people to farming, rejuvenating a sector dominated by ageing farmers. It also creates a dynamic medium-scale commercial sector. A modernized farm system can attract young people to become service providers to the sector. Farmers can buy input services such as spraying services, tractor services, and so on. Modernized farming can also spur a vibrant fabrication sector that can make simple tools and machines and also service agricultural machinery, thereby creating jobs.⁸⁸

The impact of 4IR innovations would cause fewer job losses in this sector. The sector is likely to be even more energized by 4IR innovations, with ICT helping to upgrade all stages of agricultural value chains. Precision agriculture can increase productivity at farm level by using “big data” and autonomous vehicles to optimize application of inputs. ICT platforms can help develop new business models particularly amenable to increased youth participation. Examples include enabling farmers to “buy” mechanization services by connecting them to service providers such as “Trotro Tractor,”⁸⁹ “Hello Tractor,” and the Esok⁹⁰ platform that connects farmers to markets. Blockchain technologies are being used in Malawi and Ethiopia to guarantee food safety standards that are key to accessing lucrative international food markets (box 4).

Big data and the internet of things are making “telephone farming” a reality.⁹¹ The prospects are good for a middle class able to farm remotely, thus creating the medium-scale farming segment—the crucial missing middle in the farming ecosystem—that drives transformation, brings in investment, links to markets and knowhow, and that spills over to smallholder farmers. These medium-scale commercial farmers can then contract

BOX 4

Malawi: Blockchain certifying food safety

A one-year pilot project in Malawi is exploring the use of blockchain technology to track supply chains for tea sold by consumer goods giant Unilever and the British supermarket Sainsbury's. Up to 10,000 farmers in Malawi could join the pilot, which will reward those who produce a fairer, more sustainable brew with financial incentives, such as preferential loans and access to credit. Further a group of 10 large food and retail companies, including Nestle, Unilever, and Tyson Foods joined an IBM project to study how blockchain systems can help track food supply chains and improve safety.

Source: Win 2017.

smallholder farmers and provide rural employment.⁹² Thus, while so far there has not been any reliable estimates of the job-creation potential of 4IR in the sector, there is growing evidence to suggest that it would have a significantly positive impact.

Exploring opportunities in export-oriented manufacturing

A policy priority is to encourage a shift toward more labor-absorbing growth paths, characterized by strong backward and forward linkages between firms. However, given small domestic markets, Bhorat et al. argue that manufacturing in Africa is unlikely to experience dynamic growth and job creation without a significant degree of export focus and export specialization.⁹³ Moreover, opportunities for job creation are rapidly being eroded by 4IR innovations. As robots and artificial intelligence (AI) change the economics of manufacturing, automation is erasing the cheap labor advantage and is leading to relocation of operations from Asia back to Western industrialized countries. Prices for robots are falling and making them more easily available for manufacturing. Africa's share of robots sold in 2015

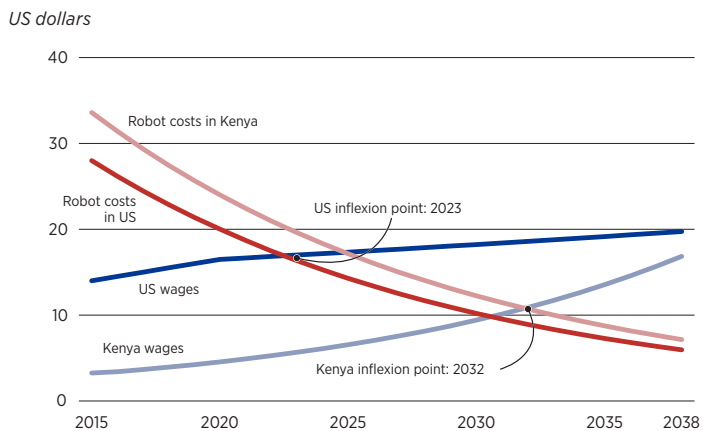
(around 0.2 percent of world sales) is more than 15 times lower than its share in world GDP (around 3 percent).

Indeed, Banga and te Velde point out that as the cost of capital falls in developed countries, their industries will find it more efficient to re-shore manufacturing activities from Africa (and elsewhere).⁹⁴ Recent evidence from the US suggests that this leads to a loss of roughly 126 African jobs per company re-shored⁹⁵. Thus, the prospect of Asian manufacturing moving to Africa as labor costs rise in Asia is gradually fading, or is at best a very problematic job creation strategy. ODI further points out that new goods emerging from 4IR are based on a digital thread connecting pre- and post-manufacturing tasks with actual manufacturing.⁹⁶ This requires advanced infrastructure, research and development (R&D) capacity, and skilled labor along the whole value chain. It is thus unlikely that manufacturing will shift to Africa, given its limited digitization. This will potentially lead to concentration of manufacturing in developed countries, limiting opportunities for technological diffusion and spill overs.

But there are opportunities for African countries to focus on less automated sectors, where technology installation has been slow.⁹⁷ Automation varies greatly across sub-sectors, with automotive, electronics, extractives, and construction sub-sectors at the forefront, while food processing, wood processing and furniture production, and garments and leather production lag behind. These sub-sectors could provide opportunities for labor-intensive local and regional market-focused manufacturing. Furthermore, even as these industries become susceptible to automation, ODI points out that due to lower labor costs, African countries will tend to have a decade or longer to adjust before the cost of robots falls enough to replace human labor.⁹⁸

Figure 13 demonstrates the evolution of automation on the furniture industry in Kenya offering some window of opportunity for increasing productivity in the sector.⁹⁹ This window can be used

FIGURE 13
Evolution of automation economics in Kenya for furniture industry



Source: Banga and te Velde 2018.

to build manufacturing capabilities, emphasizing the need for continued focus on improvements in basic infrastructure such as reliable power supply, telecommunications, and roads and railways, combined with a targeted approach to building industrial capabilities, through technological upgrading and upskilling of the labor force. With the right policies and strategies, mastering traditional manufacturing makes it easier to jump into more complex digitized manufacturing.

Modernizing the services sector

This is perhaps the sector that would benefit most from 4IR. Although highly informal, the services sector is the fastest growing sector in terms of job creation and value added to GDP in most African economies, and the potential for increased job creation is even greater with 4IR. While there are no reliable estimates of the job-creation potential of the sector, the key is to improve productivity, particularly in its large informal sub-sector. The use of ICT—such as mobile systems for payments and orders, internet, and mobile phones enabling services to be developed and rolled out—holds a lot of promise. One example is the Africa Internet Group (AIG) which leveraged internet platforms to create the first billion-dollar internet business in Africa. AIG businesses in Africa include:

Jumia (an e-commerce platform), Zando (shoes and clothing), HelloFood (a food delivery service), Kaymu (an online resale marketplace), Lamudi (a real estate classified platform), EasyTaxi (a cab-hailing service), Jovago (a hotel-booking portal), Everjobs (a jobs classified site), and Carmudi (a car-selling platform). Started in 2012, AIG now operates in 23 African countries.

Another ICT-driven service is Kenya-based M-Pesa, now the biggest money transfer system in the world. The M-Pesa platform allows people to pay for all kinds of services and is rapidly formalizing the informal sector by bringing many transactions online. Mobile phones have also brought banking, insurance, and other financial services to many previously excluded people, particularly women and youth. The Accra (Ghana) Metropolitan Authority (AMA) is exploring how it can leverage big data technologies to analyse mobile phone data to see how people move around within the city and thus optimize transportation systems.¹⁰⁰ In East Africa, M-Kopa is selling solar power to 500,000 poor households using an IoT platform that connects solar panels and cooking stoves to the internet.¹⁰¹

The other fast-growing service industries are those referred to as “smokestacks-less services.”¹⁰² These services include tourism, transport, horticulture,¹⁰³ and ICT-based services, such as business process outsourcing. These services, which are being driven by new technologies, share many characteristics with manufacturing—they are tradable, have higher productivity, can absorb large number of moderately skilled workers, and benefit from economies of scale and agglomeration.¹⁰⁴ They also offer a new perspective on industrial policy that can be characterized as “industrial policy 4.0.” Thus, in addition to the traditional light manufacturing policies that have been at the core of most African countries’ industrial policies, increased attention should be given to the service industries being spawned by 4IR innovation. While it is important to mainstream support for these emerging industries in national industrial plans and strategies, targeted reforms and interventions—particularly skills

development—will be crucial to African countries becoming globally competitive.

However, these new technologies will make some jobs vulnerable to automation. According to Kearny, in the next five years business process outsourcing jobs in finance and accounting have high potential for automation. Customer service, sales, and human resourcing jobs are at lower risk in the short to medium term, given their higher human component.¹⁰⁵ In the longer run, they will be at risk as technologies—such as natural language processing—continue to advance. This window could be used to build skills and the supportive infrastructure needed to make the most of job opportunities created higher up the value chain by 4IR—for example, in software programming.

Harnessing the full potentials of tourism

Tourism is one of the assured pathways to economic transformation due to its capacity to create jobs—particularly for women and youth—and also create linkages with other sub-sectors.¹⁰⁶ Tourism is already an important source of jobs in Kenya, Mauritius, Rwanda, Senegal, South Africa, and Tanzania.¹⁰⁷ The sector is projected to provide almost 16 million jobs in Sub-Saharan Africa by 2020.¹⁰⁸ A study found that a \$250,000 investment in the tourism sector in Zambia generates 182 full-time formal jobs, nearly 40 percent more than the same investment in agriculture.¹⁰⁹ With the exception of a few countries, tourism is very much underdeveloped in Africa despite the wide variety of cultural and leisure attractions that, if well developed, could potentially create more jobs.


Already, the tourism sector in many African countries is benefiting from 4IR innovations, and helping to expand job opportunities. Virtual reality tools are providing a new marketing tool by allowing people to sample places by visiting locations virtually. New share economy platforms—for example Airbnb and Couchsurfing—are expanding the range of tourists, making it possible for young people in particular to travel. Big data and social media provide opportunities for

micro-targeting and marketing tourism at the individual level. While the number of jobs created is yet to be assessed, anecdotal evidence suggests that these platforms are crowding micro and small entrepreneurs into the sector, and creating jobs that hitherto did not exist.

Supporting the emerging creative industry¹¹⁰

This sector, only recently recognized as a bona fide economic sector, is one of the more resilient and fastest growing in Africa. The African Development Bank¹¹¹ points out that creative industries can play an important role by: (a) using African culture and creativity as a unique selling point; (b) boosting productivity and structural transformation; (c) creating jobs for women and youth—it's labor intensive, generating more skilled and unskilled jobs; (d) generating local content, building micro, small, and medium enterprises (MSMEs), and developing skills; (e) accelerating economic growth and industrialization; and (f) enhancing regional integration and new trade patterns, and boosting exports.¹¹² The sector is huge, with a global value in 2012 of around \$2.2 trillion, while world trade in creative goods and services was \$624 billion.¹¹³

However, Africa's share of the global value of this industry remains small despite significant endowments in culture, arts, and music.¹¹⁴ The reasons for this include limited supply capacity, lack of intellectual property protection, obsolete policies and regulations, and under-investment, particularly in infrastructure.¹¹⁵ Nevertheless, the rapid rise of the Nigerian movie industry, Nollywood, shows that entrepreneurs are overcoming some obstacles. Nollywood is now the second biggest employer in Nigeria after agriculture, employing close to 300,000 people directly and over 1 million indirectly.¹¹⁶ Motion pictures, sound recordings, and music productions account for 1.42 percent of Nigeria's GDP.¹¹⁷ It has been pointed out that developing Africa's creative economy can trigger a value chain between artists, entrepreneurs, distributors, and support services across multiple



sectors to provide modern jobs, especially for youth and women. Indeed, the African Development Bank is aiming to leverage Africa's strong cultural identity and common heritage and unleash the potential of its women and youth by supporting the growth of MSMEs in the creative industries, notably the fashion, film, and food value chains.¹¹⁸

The Creative Britain report¹¹⁹ argues that there is a clear link between the development of creative industries and ICT in that when the creative and media industries join with digital technology, they become an essential source of jobs and creativity for the whole economy. The connection is evident as creative industries are often the first to employ new technology. Music distribution has totally changed and is now largely through digital

channels. 4IR technologies are also providing new ways of creating products. Already full-length feature films have been created using digitally created images, for example *Avatar*. 3D printing is allowing artists and designers to manufacture their own designs, removing the need for third parties. In Africa, Hruby points out that components of market success are starting to come together aided by 4IR technologies.¹²⁰ Rising smartphone and tablet ownership are creating a foundation for digital content development and dissemination. The South African music economy will have an estimated annual growth of 4.4 percent between 2015 and 2020, fuelled by surging digital music streaming revenues. Similarly, in Kenya the mobile music industry is starting to contribute to GDP in a measurable way—\$10m growth in industry revenue is projected between 2015 and 2020.

ANNEX

LABOR FORCE MODELING

Simulating employment outcomes for Africa

The simulation exercise we propose for consideration makes a strong but reasonable assumption that the actual values of macroeconomic relationships that prevailed in 2010–17 constitute baseline relationships for assumptions about the future.

Why is this assumption strong? Because we know from economic history that such relationships are not constant. They vary. Take, for example, the relationship most often discussed in Africa today—that between output growth and employment growth. Concerns about “jobless growth” are all predicated on the assumption that job creation is simply not responding robustly to GDP growth as it used to. In short, the macroeconomic relationship between output and employment growth has somehow changed from what it was. The relationship thus seems to vary—it is not constant. So why look to the future as if it will resemble the past when we know that this is highly questionable empirically? The answer is that this is all we have to go on, unless one wishes to adopt the ultimately shaky architecture of speculation. The central consequence of this stance is that our look at the future makes no bold claim on its predictive value. This is the essential premise of this exercise.

Indeed, our scenarios simulate future labor markets as suggestive answers to what might happen, based on baseline relationships, if we change macroeconomic assumptions. What if aggregate GDP growth in Africa were 6.7 percent (scenario D)? What if aggregate labor force participation in Africa were to reach 75 percent (scenario C)? Numbers such as these do not prevail in 2018.

On what grounds could we change macroeconomic assumptions? Are they unrealistic to assume? Could these assumptions plausibly relate to the anticipated growth dynamics of the Fourth Industrial Revolution? We think the answer is yes.

As to the baseline relationships we use, there are a few factors in their defense. First, they are historically factual. They have occurred over time, and their history is not ancient but contemporary. In other words, they conform to the structure of the African economy and labor market as it exists today, and they are based on eight previous annual data points.

Second, they are trend relationships, not based on one particularly good or particularly bad year. And, again, the data available span eight annual periods.

Third, they are “average, annual, aggregate” baseline relationships. Aggregation obviously loses country specificity, which is enormous in Africa. Nor does the dataset take what happened, say, in Tanzania, as representative of Africa. The “what ifs” deal strictly with the aggregate level.

Fourth, averaging an aggregate trend is a sure means of omitting information. What is the trade-off here? Aggregate, average trends eliminate the noise of troughs and peaks—in other words, information—and thereby arrive at a smoother standard deviation than any one country’s experience would distort.

The foregoing qualifications need therefore to be borne in mind when considering the “what if” scenarios of the future. Ours is a “next best” approach, and we don’t pretend it to be otherwise.

Elements of a model for anticipating the labor market impacts at the onset of the Fourth Industrial Revolution

Each of three “independent” variables is derived from actual, known values from our baseline data of 2010–17. We find that each percentage point of growth equaled the creation of 2.289 million jobs—when growth is 4.5 percent on average and the elasticity is 0.62. It is nonetheless important to retain the notion that in Africa and other developing regions a weaker employment response to growth is less likely to mean more open unemployment than employment growth at diminished

productivity and earnings. In other words, a lower employment elasticity might shift the composition of total employment growth between productive and working poor jobs than result in fewer people getting jobs. In both categories, however, employment will grow as a fruit of economic growth.

Note then that the level of employment elasticity and that of productivity are the two decompositions of GDP growth. If a country is growing at say 5 percent, but employment is observed to growth at 3 percent (for an employment elasticity of 0.6), then the remaining 40 percent of the growth is accounted for by productivity growth. Therefore, if the elasticity is greater than 1, productivity and hence incomes are not stable—they are declining. An elasticity of 0.7 has been proposed for low-income countries.¹²¹ Employment growth in labor surplus countries needs to be labor-rich or labor-intensive but also productive.

Toward thinking of the labor force consequences with the onset of the Fourth Industrial Revolution

There are so many questions to ask about work, leisure, and well-being in the emerging networked digital economy, but we have just one: What does it mean for productive employment?

Answers to this question depend upon how the 4IR is already changing and will change the usual factors that bear on productive employment—GDP growth, the demand for labor, the supply of labor, the growth of productivity, the rate of participation in the labor force, whether it has or can acquire the higher skills believed to characterize this era of technological change, and finally how responsive labor is to changes in GDP growth or employment elasticity.

Our model is simply that:

Productive employment = f [gdp growth, productivity, LFPR, and employment elasticity]

Productive employment is a function of all these things—and, of course more, such as the investment rate, the rate of internet usage, and other needs to maximize benefits from the 4IR such as education and skill preparedness.

The hypotheses on the impact of 4IR on the variables above are given below.

GDP

It will grow, induced by greater market efficiency—that is, speed and lower transaction costs, market reach, and greater investment.

Productivity

It will grow with the collapse of time and space barriers, higher quality e.g. through Big Data's superior aptitude at pattern recognition, or through machine learning and lower costs.

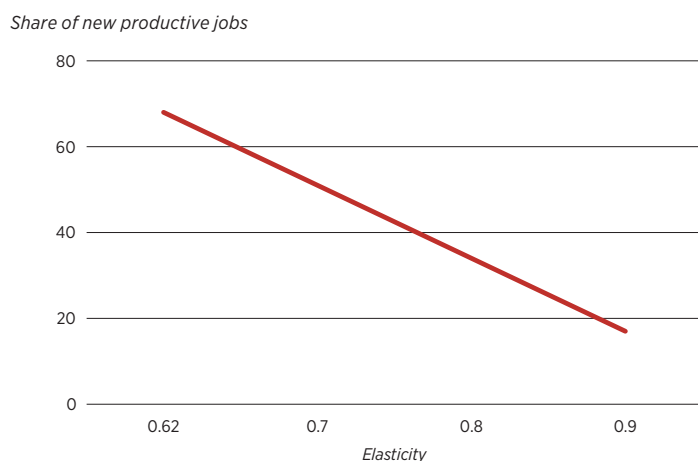
Employment

There will be job losses, particularly at the low-skill routine level, but job gains will more than compensate for job losses. The productive employment share will gain most as technology is upward skill-biased. But this hypothesis of net job gain comes with a possible downside—rising inequality.

Labor force participation rate

Working time may see adjustments, but the LFPR is likely to rise due to the proliferation of new

FIGURE A1
Share of productive jobs in total new jobs, by elasticity



Source: Authors' calculations based on ACET background research.

ways to engage the labor market irrespective of location. Working conditions in these new models of labor market engagement will be an issue. The greatest gains could be for women, who have non-market work activities to accommodate, and for young people hoping to gain a foothold in the labor market.

Employment elasticity

The former point argues for its increase. The productivity assumptions argue for its decrease, but less so if aggregate demand is stimulated through lower prices and productivity gains are broadly distributed.

We make an effort to arrive at an empirical “fix” or “calibration” of the variables above using baseline data from the African economy and labor market in 2017. The results are reported in the table below. Again, these are summary values based on already known relationships from the baseline years of 2010.

Explaining the relationships

GDP growth of 4.5 percent is consistent with the creation of 10.3 million new jobs, 68 percent of them above the international extreme poverty line (“productive jobs”), and 32 percent below (the “working poor”).

TABLE A1

Finding fixed values for predictor variables

Variable	Fixed relationships
GDP growth	Each 1 percent increase in GDP growth equals a 9.3 percent increase in employment.
Productivity growth	Each 1 percent increase in productivity equals a 1 percent increase in GDP growth and a 0.1 decline in employment elasticity in arithmetic terms, but not necessarily in reality. In our base year, a 5.5 percent growth rate (instead of 4.5 percent) increases actual employment creation of 10.3 million to 10.86 million—that is, with an elasticity 0.62.
Employment elasticity	Each 0.1 change in employment means a 0.5 percent change in the composition (productive/non-productive) of jobs. Each increase in employment elasticity implies lower GDP and productivity growth. At unity, GDP growth equals the growth of labor supply, and the productivity increase is zero.
Labor force participation rate	A 1 percent increase in the LFPR increases the labor force by 1.4 percent.

If we assume that growth had been 5.5 percent in 2017 and solve for the number of jobs that would have been created, then 4.5 over 10.3 million equals 5.5 over 11.4 million, and jobs therefore grow by 9.3 percent.

For the entire baseline period, we also know that while the number of new entrants to the labor market has grown since 2010, a constant 92 percent of them become employed.

This is to say that the unemployment rate is constant over the baseline period. And so is the activity rate. The unemployment rate does not fluctuate broadly with the growth rate in most African countries as the absence of income security means that most have to work. It is therefore income that fluctuates, and that is reflected in the composition of the labor market between working poor and productive jobs.

That said, the baseline period has been one where productive jobs have grown at 1.5 times the rate of total employment growth itself. In consequence, the working poor have been growing at a rate less than that of total employment.

Already from the beginning of the baseline period in 2010 to its conclusion in 2017, good jobs as a share of total jobs had grown from 62 percent to 68 percent. Projecting this trend out to 2030 means that good jobs will be 87 percent of all jobs created in 2030.

We calculate this by knowing that from 2017–30, the labor force will grow on average 13,766,280 annually. The employment rate did not change throughout the baseline period ($0.92 \times$ the labor force), or 12,537,000 newly employed per year. These numbers are driven by known demographics alone. We retain the 92 percent employed share of the labor force.

So, employment in baseline year plus one—2018—equals baseline employed plus 12.537 million. Because we know that good jobs grow 1.5 times more than jobs alone, to the new employed figure we add that figure times 0.015.

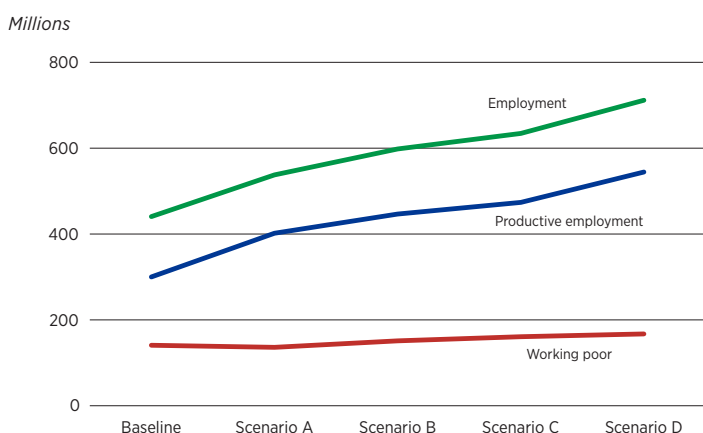
TABLE A2

Changes in employment, productive employment, and working poor using 2017 baseline data (CAGR)

Labor indicator	2017	2018	2019	2020	2021	2022	2023
Employment	440,642	453,179	465,717	478,254	490,791	503,329	515,866
Productive employment	300,058	317,284	334,769	352,516	370,529	376,275	394,644
Working poor	140,584	135,895	130,948	125,738	120,262	127,054	121,222
% PE share	68%	70%	72%	74%	75%	75%	77%

FIGURE A2

Changes in the quantity and quality of jobs depending on the scenario



Source: Authors' calculations based on ACET background research.

A 1 percent increase in GDP growth will increase employment by 9.3 percent. To the extent that gains in labor productivity mean that the same number of workers produce more output per person—or with no change in output, fewer workers are needed to produce it—both of which amount to the same—it is intuitively clear that productivity increases are not necessarily job enhancing, at least in the short term. If productivity increases result in lower prices and consumer purchase decisions are price elastic, then employment will increase through the aggregate demand channel. It is also the case that the locus of labor productivity increases might be job destroying while job gains occur elsewhere in the economy. (Empirically, this is very often the case.) It is quite clear in empirical terms that productivity growth and more jobs go hand in hand historically as do standards of living.

In theory, when the elasticity is unity, then employment simply equates to labor supply. Conversely, when it is 0, growth of whatever magnitude produces zero net employment growth.

We calculate that each decline of 0.1 in the elasticity is the equivalent of needing an additional 0.5 percent of growth if employment is to be held constant at its current decomposition into productive and working poor jobs.

As noted, in the African context, it is less the quantity of jobs that is likely to vary under different growth rates, but their quality. In 2017, an increase of the GDP growth rate will create 1.4 million additional jobs while reducing the employment elasticity by 0.1 percent. The growth increase is more than adequate to accommodate the new jobs at their existing, if not better, composition into productive and working poor jobs.

We establish compound annual growth values for the employed, productively employed, and working poor variables through 2023. These numbers are all anchored in the “real” values we tried to fix for the baseline years.

Here is how using the fixed relationship variables could be notionally useful for simulating what could happen in the future. A change in growth, a change in productivity and LFPR, and implicitly employment elasticity, are looked at here. Three scenarios see the labor force expanding relative to the working age population, the latter being a fixed demographic fact.

Changing the scenario in 2022 using baseline predictors

Imagine in 2022 that 4IR technologies have sufficiently diffused and that three scenarios are well within reason:

- In Scenario A, we simply assume business as usual in 2022. That is that the same relationships we calculated for 2017 do not change as we go forward—with two exceptions. First, and obviously, the population and therefore

TABLE A3

Summary of the simulated values obtained in 2022 under the different scenarios

Thousands

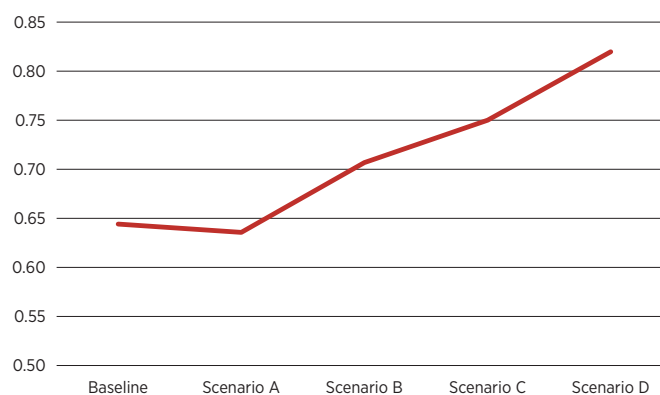
Labor indicator	Baseline data from 2017	Scenario A Unemployment falls to a frictional 4%	Scenario B Productivity grows in 2022 to 4.5%	Scenario C LFPR increases to 75%	Scenario D GDP growth increases 1% to 6.7%
Working age population (15+)	742,615	881,212	881,212	881,212	904,323
Labor force	478,391	560,162	622,901	660,909	741,318
Employment	440,642	537,756	597,985	634,473	711,665
Productive employment	300,058	401,704	446,695	473,951	544,424
Working poor	140,584	121,634	151,290	160,522	167,241
Unemployed	37,756	22,406	24,916	26,436	29,653
LFPR	64.4%	64.4%	65.2%	75%	75%
% of productive jobs in total	68.0%		74.7%	74.7%	76.5%
Ratio of the labor force to the working age population	0.64	0.64	0.71	0.75	0.81
GDP growth rate	4.5%	4.5%	5.7%	Increased	6.7%
Employment elasticity	0.63	0.63	0.54	increased	0.586

the working age population is growing, and these higher values need to be factored in from the CAGR table (table A2) above. Second, we assume an unemployment rate of 4 percent, to simulate something like frictional unemployment. The no-longer-unemployed are shared between the productively employed and the working poor at their fixed value rates of growth—that is, we know that productive employment increases at 1.5 times the rate of the working poor. Doing this does not change the size of the labor force—it merely changes its composition (more employed, fewer unemployed).

- In Scenario B, productivity growth reaches 4.5 percent. We know that the baseline relationship between productivity and GDP growth that is 3.8 percent productivity growth results in 4.5 percent GDP growth. So, the new GDP growth rate in Scenario B is 5.7 percent in 2022. Our fixed value tells us that each percentage point of GDP growth adds 9.3 percent more jobs. So, jumping from a 4.5 percent GDP growth to 5.7 percent means 1.2 times 9.3 more jobs. The employment elasticity declines, but the greater growth more than compensates for this through job creation.

FIGURE A3

The labor force as a share of the working age population increases as the inactive become employed



Source: Authors' calculations based on ACET background research.

- Scenario C uses the results of Scenario B, but expands the labor force participation rate to 75 percent. To the extent that 4IR can expand ways to engage the labor market, including accessing platforms from home, the increased LFPR is not unrealistic. This will increase GDP growth and the employment elasticity, but we don't know by how much. Just as in Scenario B as well, greater labor force participation draws in some of the inactive and

increases the ratio of the labor force to the working-age population.

- With a previous increase in productivity (Scenario B), and now an increase in the LFPR, we speculate in Scenario D a further increase in GDP growth as the former changes percolate through the economy. We assume a 6.7 percent GDP growth rate, but this time for the following year, 2023. As with the two previous scenarios, one consequence of more growth is to draw yet more people into the labor force.

NOTES

1. Rifkin 2013.
2. The computer read lips with 95 percent accuracy, outperforming professional human lip readers who tested at 52 percent accuracy. Hal Hodson, "Google's DeepMind AI can lip-read TV shows better than a pro," *New Scientist*, November 21, 2016.
3. Hatzakis 2016.
4. WEF 2017.
5. *The Economist* 2015.
6. Marvin 2017, Iansiti and Lakhani 2017.
7. World Energy Outlook 2017.
8. This is likely to spell doom for car companies. One car in a sharing economy removes 22 cars from the road. This is because in the current ownership model a car spends 93 percent of its lifetime idle.
9. The study is based on an extensive desk review complemented by both qualitative and quantitative data collection in 11 selected African countries representing all regions. These are: Côte d'Ivoire, Egypt, Ethiopia, Gabon, Ghana, Kenya, Morocco, Rwanda, Senegal, South Africa, and Tunisia. It should be noted that while 11 countries were surveyed, in four countries, only one of the survey instruments was administered due time limitations and difficulties in getting a local counterpart. The other caveat to emphasize is that responses from this survey cannot be generalized to the entire populations of countries. This is simply a case study—a random sampling of individuals in each of the 11 selected countries.
10. MGI 2017a.
11. MGI 2017b.
12. MGI 2017a.
13. Goos and Manning 2007.
14. Bessen 2017.
15. Autor and Salomons 2017.
16. Mann and Putterman 2017.
17. Frey and Osborne 2013.
18. Banga and te Velde 2018.
19. Banga and te Velde 2018.
20. MGI 2017b.
21. Bloom et al 2016.
22. Ngom 2017.
23. Bloom et al. 2016.
24. IMF 2014.
25. World Bank 2015.
26. Ashraf et al. 2013.
27. Canning et al. 2015.
28. IMF REO for Sub-Saharan Africa 2017.
29. World Bank (2015) <http://documents.worldbank.org/curated/en/131891468179371220/pdf/100383-PUBLIC-Box393231B.pdf>.
30. Ngom 2017.
31. Bloom et al. 2016.
32. IMF 2014.
33. Shimeles 2018.
34. World Bank 2015.
35. <https://www.khanacademy.org/>.
36. ODI 2018.
37. Cirera 2016.
38. WEF 2017.
39. Muralidharan and Prakash 2013.
40. Wage workers with more schooling are also more likely to work in the formal sector (Fox and Filmer 2014).
41. Hanushek and Woessmann 2015. Fox and Filmer (2014) analyzed skills based on PISA outcomes from 76 countries and focused on "basic skills" needed for full participation in today's global economy. Students from some developing countries who participated in PISA performed dramatically lower than the average of OECD countries. They also found that performance was not linked to resources so just simply increasing resources is not a sufficient solution for improving outcomes.
42. Cunningham and Villasenor 2014, Almund et al. 2011, and Moffit et al. 2011.
43. Carneio et al 2006, World Bank 2018, Heckman 2007, Helmers and Patnam 2011, Arias 2014, Sondergaard 2012.

44. Krishnan and Patnam 2014.
45. Klinger et al. 2013.
46. This is in line with evidence from middle and high-income countries.
47. Some East Asian states already have a broad concept of upper secondary vocational education. The vocational high schools in Japan, South Korea, and Thailand have traditionally offered rather broad initial vocational training.
48. Jakubowski et al. 2011.
49. Upper secondary is often viewed as preparation for higher education and TVET for work.
50. World Bank 2016.,
51. AfDB 2017, Banerji et al. 2010.
52. AfDB 2017.
53. World Bank 2018.
54. R4D 2015.
55. Fox and Filmer 2014.
56. Fox and Filmer 2014.
57. ACET 2014.
58. Fox and Filmer 2014.
59. UIS 2015, World Bank 2018, R4D 2016.
60. UNESCO–UIS 2015, World Bank 2018.
61. World Bank 2016.
62. Pedro 2012, Trucano 2005, UNESCO 2011.
63. Teaching and learning processes also need to change for education systems to leapfrog other countries (Brookings Institute 2018). For example, non-cognitive skills cannot be taught by rote, but require different teaching approaches. An example is Learner Guides (Camfed run program), who use student-led learning and collaboration through peer-to-peer learning to teach skills such as resilience and goal setting.
64. *The Economist* 2017.
65. Lopez 2017.
66. Although Kenya has deployed electricity and internet access to remote rural schools, raising the proportion of schools with electricity from 43 percent in 2013 to 95 percent in 2016. More than 90,000 teachers have been trained in delivering digital learning while e-learning has been introduced in more than 18,000 primary schools (<http://www.worldbank.org/en/news/opinion/2017/10/11/africa-can-enjoy-leapfrog-development>).
67. UIS 2015.
68. World Bank 2016.
69. UIS 2015.
70. New ways of learning, characterized by personalization, engagement, use of digital media, collaboration, bottom-up practices, and where the learner or teacher is a creator of learning content are emerging, facilitated by the growth in online education resources available via the internet.
71. Although obviously infrastructure is needed to implement the curriculum.
72. An in-depth review of the education and skills development and its implication for the 4IR is provided in a separate study undertaken by ACET.
73. Enabling 4IR infrastructure refers to the proximate determinants—namely internet penetration and coverage, quality and cost—while recognizing that energy, power, transport, and other services play crucial roles.
74. Banga and te Velde 2018.
75. Banga and te Velde 2018.
76. 5G network is on the horizon.
77. Universal Service and Access Fund (USAF)—a fund into which contributions from operators and other sources are paid for the purpose of providing basic and advanced telecommunications services to underserved areas, communities, or individuals who cannot afford such services on their own.
78. Banga and te Velde 2018.
79. Bright 2017.
80. <http://www.kosmosinnovationcenter.com/overview-acceleration/>.
81. ACET Field Survey 2018.
82. Under the new regulations, commercial drone owners must pay Sh100,000 (about \$1,000) for an operator's certificate while commercial drone pilots will part with Sh40,000 (about \$400) and a further Sh40,000 when renewing their flying permits after one year. These fees can be punitive for young people who are likely to be the key innovators in using drones. Currently, young people use them to shoot movies, weddings, and so on. (Kariuki 2018).
83. Sandbox is a testing environment that isolates untested code changes and outright experimentation from the production environment.
84. MGI 2012.
85. ODI 2018.
86. ACET 2017.
87. ACET 2017.

88. ACET 2017, AfDB 2018.
89. <http://www.trotrotractor.com/>.
90. <https://www.esoko.com/>.
91. IBM's EZ-Farm project is exploring how sophisticated data analytics can help farmers keep in touch with what is really happening on their out-of-town smallholdings. Sensors strategically placed around the farm monitor water tank levels, the amount of moisture in the soil, as well as the performance of irrigation equipment. Infrared cameras measure rates of photosynthesis, which can indicate whether crops are being watered too much or too little. All these data are streamed wirelessly to the IBM Cloud and accessed by the farmer via a smartphone app. <http://www.bbc.com/news/business-33610593>.
92. ACET 2017.
93. Bhorat et al. 2017.
94. ODI 2018.
95. As of 2015 250,000 jobs have been re-shored to the US since 2010 (Reshoring Initiative 2015, cited in ODI 2018).
96. ODI 2018.
97. Banga and te Velde 2018.
98. ODI 2018.
99. Banga and te Velde 2018.
100. <http://www-03.ibm.com/press/us/en/pressrelease/40817.wss>.
101. <http://www.idgconnect.com/abstract/26156/how-iot-big-data-tackling-africa>.
102. Page 2018. <https://www.brookings.edu/multi-chapter-report/foresight-africa-top-priorities-for-the-continent-in-2018/>.
103. Ethiopia, Ghana, Kenya, and Senegal all actively participate in global horticultural value chains. Ethiopia has achieved extraordinary success in flower exports, so much so that the country is now a global player in the sector.
104. Page 2018.
105. Kearney 2017.
106. ACET 2014.
107. In 2014 9.5 million tourists visited South Africa, contributing 3 percent to its GDP. In 2014, 9.5 million tourists visited South Africa, contributing 3 percent to its GDP.
108. ACET 2014.
109. Christie et al. 2013.
110. The general definition of this sector covers all arts and crafts and their product outputs, and is being expanded to sports, leisure parks, and software development (for example, games), culinary arts (food), and even creative endeavours that happen in traditional organizations, especially R&D (Newbigini, n.d.).
111. AfDB n.d.
112. The seminal UNCTAD report (2010; cited in UNDP/UNESCO 2013) on the creative economy points out that "adequately nurtured, creativity fuels culture, infuses a human-centered development and constitutes the key ingredient for job creation, innovation and trade while contributing to social inclusion, cultural diversity and environmental sustainability."
113. Lopes 2015, UNDP–UNESCO 2013.
114. *African Business* 2014.
115. *African Business* 2014.
116. Hruby 2018.
117. Lopes 2015.
118. AfDB n.d.
119. Newbigini nd.
120. Hruby 2018.
121. Kahn 2001.

REFERENCES

- Africa Business. 2014. "African Creative Industries: The Sleeping Giant." *African Business Magazine*. 28 January 2014. <http://africanbusinessmagazine.com/uncategorised/african-creative-industries-the-sleeping-giant/>.
- ACET. 2014. *Africa Transformation Report*. African Centre for Economic Transformation (ACET). Accra.
- AfDB (African Development Bank). 2013. *At the Center of Africa's Transformation: Strategy for 2013–2022*. Abidjan: African Development Bank.
- . n.d. *Investing in the Creative Industries: Fashionomics*. Abidjan: Africa Development Bank. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Fashionomics_creative_industries_executive_summary_brochure.pdf.
- . 2015. *African Development Report 2015 Growth, Poverty and Inequality Nexus*. Abidjan: African Development Bank Group.
- . 2016. *Jobs for Youth in Africa—Strategy for Creating 25 Million Jobs and Equipping 50 Million Youth*,

- 2016–2025. Abidjan: African Development Bank Group.
- . 2017. *Africa Transformation Report 2017: Agriculture Powering Africa*. Accra: African Centre for Economic Transformation.
- . 2017. “Growth and Job Creation: Policy Options for Pro-Employment Growth.” Background paper for the *African Economic Outlook 2018* report of the African Development Bank. African Development Bank Group, Abidjan.
- . 2018. *Africa Economic Outlook 2018*. Abidjan: African Development Bank Group.
- Agbor, J. 2012. “Poverty, Inequality, and Africa’s Education Crisis.” Brookings Institution.
- Ashraf, Q., D. Weil, and J- Wilde. 2013. “The Effect of Fertility Reduction on Economic Growth,” *Population and Development Review*, 39.
- Autor, D. H. 2015. “Why Are There Still So Many Jobs? The History and Future of Workplace Automation.” *Journal of Economic Perspectives* 29(3): 3–30.
- Autor, D., and A. Salomons. 2017. “Does Productivity Growth Threaten employment?” Working paper prepared for ECB Forum on Central Banking, June 2017.
- Banerji, A., Cunningham, W., Fiszbein, A., King, El., Patrinos, H., Robalino, D., Tan, J-P. 2010. *Stepping Up Skills for More Jobs and Higher Productivity*. Washington, DC: World Bank.
- Banga K. and D. W. te Velde. 2018. *Digitalisation and the Future of Manufacturing in Africa*. Draft report. February 2018. ODI SET Programme.
- Benjamin, N., and Mbaye, A.A. 2014. Informality, Growth, and development in Africa. *WIDER Working Paper* 2014/052. UNU–Wider.
- Bhorat, H., and F. Tarp, eds. 2016. *Africa’s Lions: Growth Traps and Opportunities for Six African Economies*. Washington, DC: Brookings Institution Press.
- Bhorat, H., Steenkamp, F., Rooney, C. 2017. Understanding the Determinants of Africa’s Manufacturing Malaise. In: A. Odusola, G.A. Cornia, H. Bhorat, and P. Conceição (eds.), *Income Inequality Trends in Sub-Saharan Africa: Divergence, Determinants, and Consequences*. New York: United Nations Development Program: 103 – 128.
- Bloom, D., D. Canning, and J. Sevilla. 2003. *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. Santa Monica, CA: RAND.
- Bloom, D., M. Kuhn and K. Prettnner. 2016. “Africa’s Prospects for Enjoying a Demographic Dividend,” Vienna Institute of Demography, Working Paper 4/2016.
- Bright, J (2016). *A Brief Overview of Africa’s Tech Industry—and 7 Predictions for Its Future*. World Economic Forum on Africa. <https://www.weforum.org/agenda/2016/05/a-brief-history-of-africa-s-tech-industry-and-7-predictions-for-its-future/>.
- Canning, D., S- Raja, and A. Yashek, eds. 2015. *Africa’s Demographic Transition: Disaster or Dividend?* Washington DC: World Bank Group.
- Carneiro, P., Crawford C. and Goodman, A. (2006) “Which Skills Matter?’, Unpublished, Institute for Fiscal Studies.
- Christie, I., E. Fernandes, H. Messerli, and L. Twining-Ward. 2013. *Tourism in Africa: Harnessing Tourism for Growth and Improved Livelihoods*. The World Bank.
- Cirera, X. 2016. Catching Up to The Technological Frontier? Understanding Firm-Level Innovation and Productivity in Kenya. Innovation and Entrepreneurship, Trade and Competitiveness Global Practice, the World Bank.
- Cunningham, W. Villaseñor, P. 2014. Employer Voices, Employer Demands, and Implications for Public Skills Development Policy. Policy Research working paper; no. WPS 6853. Washington, DC: World Bank Group.
- Dawes, L., P. Nema, and R. Zelezny-Green. 2014. “Scaling Mobile Employment Services: A Stakeholder Perspective: Increasing Opportunities for Youth through Mobile.” GSMA Mobile for Employment, May 13. <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/05/Scaling-Mobile-Employment-Services-A-Stakeholder-Perspective.pdf>.
- de Klerk, Nico. No date. *Fourth Industrial Revolution: A Force for Stability or Volatility in Africa?* http://www.defenceweb.co.za/index.php?option=com_content&view=article&id=43192&Itemid=116&catid=

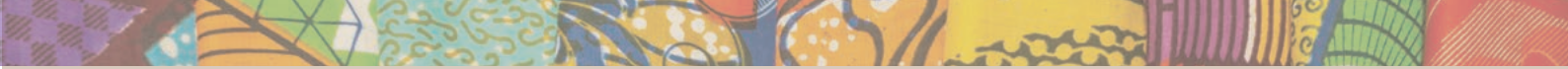
- Drummond, P., V. Thakoor, and S. Yu. 2014. "Africa Rising. Harnessing the Demographic Dividend," IMF Working Paper, WP/14/143.
- Economist, The.* 2012. "The Third Industrial Revolution." April 21.
- Economist, The.* 2015. "The Promise of Blockchain—The Trust Machine." October 31.
- Economist, The.* 2017. "What technology can do for Africa." November 9.
- Ehrhart, H., M. Le Goff, Maelan, E. Rocher, R. Singh. 2014. *Does Migration Foster Exports? Evidence from Africa.* Policy Research working paper; no. WPS 6739. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/520651468194076878/Does-migration-foster-exports-evidence-from-Africa>.
- Filmer, D. and L. Fox. 2014. "Youth Employment in Sub-Saharan Africa." Africa Development Forum; Washington, DC: World Bank and Agence Française de Développement.
- Firsing, S. (2018). How severe is Africa's Brain Drain?. LSE Blog Series: *African Perspectives on Migration.* <http://blogs.lse.ac.uk/africaatlse/2016/01/18/how-severe-is-africas-brain-drain/>.
- Freire, M. E., S. Lall, and D. Leipziger. 2014. "Africa's Urbanization: Challenges and Opportunities." Working Paper No. 7, The Growth Dialogue, Washington, DC.
- Frey, C. B. and M. A. Osborne. 2013. "The Future of Employment: How Susceptible are Jobs to Computerization?" Oxford Martin School, September.
- Frigenti, F., and F. C. Rosati. 2017. "Moving Upstream the 'Relevant' Migration Frontier. Strategic Priorities to Turn the Migration Challenge into a Development Opportunity." ICID blog, the Italian Centre for International Development. http://www.icid.info/icid-blog/9-69/moving-upstream-the-relevant-migration-frontier-strategic-priorities-to-turn-the-migration-challenge-into-a-development-opportunity#.WnwewK5l_IX.
- Goos, Maarten, and Alan Manning. 2007. "Lousy and Lovely Jobs: The Rising Polarization of Work in Britain." *Review of Economics and Statistics.* 89(1): 118–33.
- Hanushek, E., and L. Woessmann. 2015. *Universal Basic Skills: What Countries Stand to Gain.* Paris: Organisation for Economic Co-operation and Development (OECD).
- Hatzakis, E. D. 2016. The Fourth Industrial Revolution. *CIO Reports. The Weekly Letter.* February 2, 2016. Bank of America Merrill Lynch.
- Helmets, C. and M. Patnam. 2011. "The Formation and Evolution of Childhood Skill Acquisition: Evidence from India." *Journal of Development Economics* 95 (2): 252–266.
- Hruby, A. 2018. "Tap Creative Industries to Boost Africa's Economic Growth." *The Financial Times.* March 22. <https://www.ft.com/content/9807a468-2ddc-11e8-9b4b-bc4b9f08f381>.
- Iansiti, M. and K. R. Lakhani. 2017. "The Truth About Blockchain." *Harvard Business Review.* January–February. <https://hbr.org/2017/01/the-truth-about-blockchain>.
- Jakubowski, M., H.A. Patrinos, E.E. Porta, and J. Wiśniewski. 2016. "The Effects of Delaying Tracking in Secondary School: Evidence from the 1999 Education Reform in Poland." *Education Economics* 24(6): 557–572.
- Kariuki, J. 2018. "Drones Firm in Plea to Reduce Fees for Would Be Owners." *Business Daily.* Tuesday, March 20. <https://www.businessdailyafrica.com/corporate/tech/Drones-firm-in-plea-to-reduce-fees-for-would/4258474-4349910-35uwp8/index.html>.
- Klinger B., A.I. Khwaja, and C. del Carpio. 2013. "The Development Problem." In *Enterprising Psychometrics and Poverty Reduction.* Springer Briefs in Psychology. Springer, New York.
- Krishnan, P. and M. Patnam. 2014. "Neighbors and Extension Agents in Ethiopia: Who Matters More for Technology Adoption?," *American Journal of Agricultural Economics.* 96(1): 308–327. Agricultural and Applied Economics Association.
- Lopes, C. 2015. "How Can Africa Profit from Its Creative Industries?" September 3. <https://www.weforum.org/agenda/2015/09how-can-africa-profit-from-its-creative-industries/>.
- Lopez, D. 2017. "21st Century Education: 7 Elements of Future Ready Schools." June 13. <http://>

- blog.screenbeam.com/2017/06/13/21st-century-education-7-elements-of-future-ready-schools/.
- Mann, K. and L. Püttmann. 2017. "Benign Effects of Automation: New Evidence from Patent Texts" September 22. <https://ssrn.com/abstract=2959584> or <http://dx.doi.org/10.2139/ssrn.2959584>.
- Marvin, R. 2017. "Blockchain: The Invisible Technology That's Changing the World." *PC Magazine*. August 29. <https://www.pcmag.com/article/351486/blockchain-the-invisible-technology-thats-changing-the-world>.
- MGI (McKinsey Global Institute). 2012. *Africa at Work: Job Creation and Inclusive Growth*. McKinsey Global Institute.
- MGI. 2016. *Lions on The Move II: Realizing Potential of African Economies*. Mckinsey Global Institute.
- MGI. 2017a. *A Future That Works: Automation, Employment, and Productivity*. Mckinsey Global Institute. January 2017.
- MGI. 2017b. *Jobs Lost, Jobs Gained: Workforce Transitions in A Time of Automation*. Mckinsey Global Institute. December 2017.
- Moffitt T.E., L. Arseneault, D. Belsky, N. Dickson, R.J. Hancox, H. Harrington, and A. Caspi. "A Gradient of Childhood Self-control Predicts Health, Wealth, and Public Safety." *Proceedings of the National Academy of Sciences*. 108 (7): 2693–2698.
- Muralidharan, K. and N. Prakash. 2017. "Cycling to School: Increasing Secondary School Enrollment for Girls in India," *American Economic Journal: Applied Economics* 9(3): 321–350.
- Newbiggin, J. n.d. What Is "The Creative Economy?" <https://creativeeconomy.britishcouncil.org/guide/what-creative-economy/>.
- Ngom, M. 2017. "What to Expect from Africa's Demographic Dividend." January 18. ID4D, Agence française de développement.
- Ngunjiri, J. 2018. Kenya tops in phone internet traffic globally. Business Daily. TUESDAY, MARCH 20, 2018 16:27. <https://www.businessdailyafrica.com/corporate/tech/Kenya-tops-in-phone-internet-traffic-/4258474-4349966-3m4lrez/index.html>.
- Ngwe Luc. 2018. African brain drain: is there an alternative? *The UNESCO Courier*, January–March 2018. <https://en.unesco.org/courier/2018-1/african-brain-drain-there-alternative>.
- Pedro, F. 2012. "Trusting the Unknown: The Effects of Technology Use in Education. In Soumitra D. and B. Bilbao-Osorio (eds.). *The Global Information Technology Report 2012: Living in a Hyperconnected World*. Geneva: World Economic Forum and INSEAD.
- Ratha, D., S. Mohapatra, C. Özden, S. Plaza, W. Shaw, and A. Shimeles. 2011. *Leveraging Migration for Africa: Remittances, Skills, and Investments*. Washington, DC: World Bank.
- R4D. 2015. Innovative Secondary Education for Skills Enhancement (ISESE): "Skills for Employability in Africa and Asia." ISESE Skills Synthesis Paper. Results for Development Institute (R4D), prepared by Nicholas Burnett and Shubha Jayaram. <http://www.resultsfor-development.org/>.
- Shimeles, A. 2018. "Understanding the Patterns and Causes of African Migration: Some Facts." *Foresight Africa Viewpoint*. January 18. <https://www.brookings.edu/blog/africa-in-focus/2018/01/18/foresight-africa-viewpoint-understanding-the-patterns-and-causes-of-african-migration-some-facts/>.
- Sondergaard, L., and M. Murthi, with D. Abu-Ghaida, C. Bodewig, and J. Rutkowski. 2012. "Skills, Not Just Diplomas: Managing for Results in Education Systems in Eastern Europe and Central Asia." World Bank, Washington, DC.
- Timmer, M.P., G.J. de Vries, and K. de Vries. 2015. "Patterns of Structural Change in Developing Countries." In Weiss, J., and M. Tribe (eds.). *Routledge Handbook of Industry and Development*. Routledge.
- Trucano, M. 2005. "Knowledge Maps: ICT in Education." Information for Development Programme. Washington DC: World Bank. www.infodev.org/en/Publication.8.html.
- UIS. 2015. "ICT in Education in Sub-Saharan Africa: A Comparative Analysis of Basic e-Readiness in Schools." Information Paper 25. Montreal, Canada. <http://unesdoc.unesco.org/images/0023/002342/234279e.pdf>.

- UNDP. 2016. *Human Development Report 2016: Human Development for Everyone*. United Nations Development Programme. New York.
- UNDP–UNESCO. 2013. *Creative Economy Report: Widening Local Development Pathways*. United Nations Development Programme (UNDP) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).
- UNESCO (United Nations Educational, Scientific, and Cultural Organization). 2011. *Arab Youth: Civic Engagement and Economic Participation*. Beirut: UNESCO Regional Bureau for Education in the Arab States.
- WEF. 2017. *The Future of Jobs and Skills in Africa—Preparing the Region for the Fourth Industrial Revolution*. Davos-Klosters: World Economic Forum, May.
- Win T. L. 2017. “Can Blockchain Ensure Unilever’s Tea Farmers Produce a Fairer Brew?” Thomson Reuters Foundation. December 13. <http://news.trust.org/item/20171213163250-gu8do/>.
- World Bank. 2016. *World Development Report 2016: Digital Dividends*. Washington, DC.
- World Bank. 2018. *World Development Report 2018: Learning to Realize Education’s Promise*. Washington, DC.

ABBREVIATIONS

4IR	Fourth Industrial Revolution	MGI	McKinsey Global Institute
AMA	Accra (Ghana) Metropolitan Authority	MSMEs	Micro, small, and medium enterprises
3D	Three-dimensional	ODI	Overseas Development Institute
ACET	African Centre for Economic Transformation	OECD	Organisation for Economic Cooperation and Development
AfDB	African Development Bank	PPP	Purchasing power parity
AIG	Africa Internet Group	R&D	Research and development
CAGR	Compound annual growth rate	RES	Renewable energy source
EMIS	Educational management information systems	SDG	Sustainable Development Goal
GDP	Gross domestic product	STEM	Science, technology, engineering, and mathematics
ICT	Information and communication technology	SWT	School-to-work transition
IMF	International Monetary Fund	TFR	Total fertility rate
IPR	Internet penetration rate	TVET	Technical and vocational educational training
ITU	International Telecommunications Union	USAF	Universal Service and Access Fund
KENIA	Kenya National Innovation Agency	USAF	Universal service access fund
KIC	Kigali Innovation City	WEF	World Economic Forum
LFPR	Labor force participation rate		





STRATEGIES FOR JOBS IN THE DIGITAL AGE

Brahima Sangafowa Coulibaly

Senior Fellow, Global Economy and Development
Director, Africa Growth Initiative
Brookings Institution, Washington DC

 @BSangafowaCoul

The technological innovations associated with the fourth industrial revolution should be viewed as a process of dynamic adjustment, not as a fundamentally destructive process that requires erecting barriers to innovation. To remain competitive in the global economy, African countries will have to continue upgrading their production technologies, which could disrupt labor markets in affected sectors, creating similar challenges to those faced by advanced economies. But while labor-saving technologies threaten Africa's comparative advantage in low wages, and thus its ability to attract low-wage global industrial jobs, other aspects of the fourth industrial revolution are creating tremendous opportunities for employment and inclusive growth in Africa. In addition to job creation, digitization has facilitated the development of platforms to address challenges in various sectors and accelerate economic development.

INTRODUCTION

The advent of the fourth industrial revolution, characterized by rapid digitization and growing use of new technologies—artificial intelligence, cloud computing, robotics, 3-D printing, the internet of things, and advanced wireless technologies, among others—ushered in a new era of economic disruption and ignited a global debate about the implications for labor markets or “the future of work.”

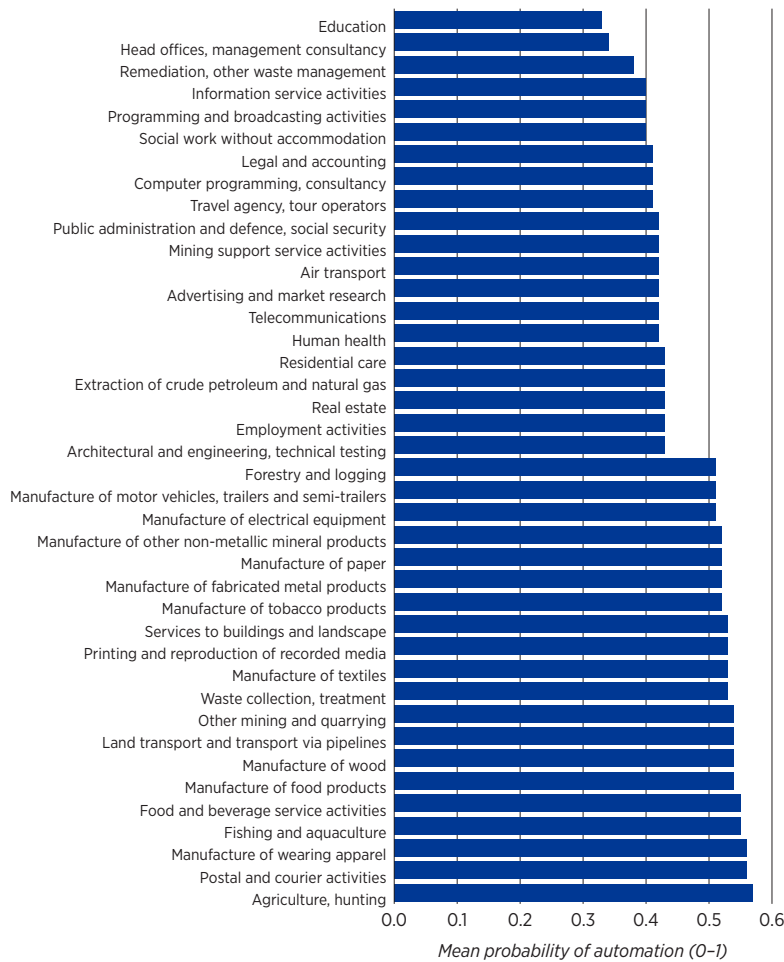
DYNAMIC ADJUSTMENT OR JOB DESTRUCTION?

Skeptics argue that at the current rate of adoption of labor-saving technology, millions of jobs are at risk of disappearing; by some estimates, automation

threatens half of all jobs globally, or around 2 billion jobs. The average risk of loss of jobs to automation varies by industry, ranging from lower risk in education to higher risk in agriculture (figure 1). In addition to the loss of jobs, concerns have also arisen about the effect of new technologies on income distribution. By replacing low-skilled manual jobs and complementing high-skilled workers, modern technologies raise skill premiums and increase income inequality. They also contribute to inequality by facilitating the creation of monopolistic winner-take-all markets for new goods and services.

To those on the other side of the debate, this view on new technologies and the labor market is incomplete, at best, and incorrect on the merits for the same reasons that it was incorrect during past technological revolutions. Technological

FIGURE 1
Average risk of automation for the 20 lowest risk and 20 highest risk industries, 2018



Source: Nedelkoska and Quintini 2018.
 Note: Industry classification is ISIC Rev. 4, 2-digit. Original data from Survey of Adult Skills (PIAAC) 2012, 2015.

disruptions have been a feature of economic transformation since the first industrial revolution. Similar dire predictions of large-scale job destruction and technology-driven unemployment made during previous episodes of technological revolution failed to materialize. Instead, new technologies spurred productivity growth and structural economic transformation to generate prosperity. The evidence that the fourth industrial revolution will be different has not been conclusively established. In fact, the new technologies of the digital revolution have lowered market barriers and information costs and are generating opportunities for entrepreneurship and self-employment.

Transitions always involve uncertainty and generate understandable anxiety as some jobs or tasks become obsolete and disappear, but ultimately, new and often better ones are also created. As such, current technological innovations should be viewed as a process of dynamic adjustment, not as a fundamentally destructive process that requires erecting barriers to innovation.¹

LABOR-SAVING TECHNOLOGIES MAY COMPOUND AFRICA'S JOB CREATION CHALLENGE

What these perspectives on labor-replacing technologies share is a tendency to focus on advanced economies and on industrial jobs, which raises questions about their relevance for low-income countries. In Africa, informal employment dominates the labor market. Its share of nonfarm employment averages 60 percent and ranges from 30 to 90 percent.² Furthermore, the share of employment in manufacturing is below 10 percent, and a large share of the population, particularly young people, is unemployed or underemployed. In this context, how can Africa be concerned about losing industrial jobs that it does not have in abundance to robots that it does not use?

In fact, the debate is just as relevant for Africa. Rapidly aging populations in advanced and some emerging market economies cushion the effect of automation on employment. For Africa, in contrast, where the workforce is young and growing rapidly, the impact of automation could be more severe. Indeed, evidence is emerging on the hollowing out of labor markets in developing economies, mirroring patterns observed in the West, and of premature deindustrialization.³ African policymakers, just as those in advanced economies, need to plan accordingly.

To remain competitive in the global economy, African countries will have to continue upgrading their production technologies, which could disrupt labor markets in affected sectors, creating similar

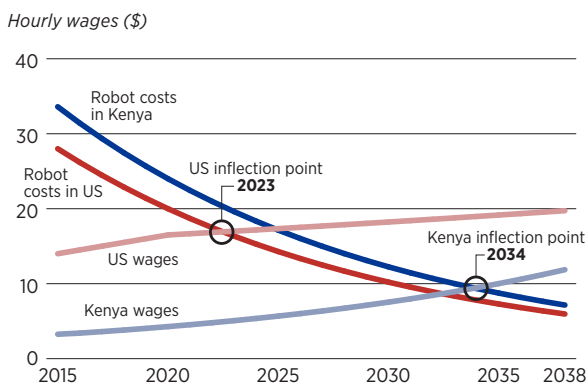
challenges to those faced by advanced economies. Some evidence suggests that Africa is increasingly automating, albeit at a slower pace than other regions. For example, while Africa accounted for 0.05 percent of global robot sales in the early 2000s, that share has risen to 0.2–0.5 percent in recent years. The intensity of automated production in Africa remains low in part because of low labor costs. As the cost of robots declines, manufacturers in Africa will find it profitable to further automate production. For furniture manufacturing in Kenya, for example, the inflection point—when it becomes more profitable to substitute robots for labor—is projected to occur in 2034 (figure 2).⁴

More seriously, labor-saving technologies threaten Africa’s comparative advantage in low wages, and thus its ability to attract low-wage global industrial jobs, worsening the region’s jobs gap. Historically, countries that faced the challenge of large-scale job creation have addressed it by attracting low-wage global manufacturing jobs from more advanced economies that were moving up the value ladder and outsourcing production in the face of rising labor costs.

Since the first industrial revolution in the West, Japan, several East Asian countries, and now China have all undergone large-scale industrialization, partly because they had competitive labor costs. Now that labor costs are rising in China, the incentives are mounting for labor-intensive manufacturing firms to shift production to African countries, where labor costs are more competitive. However, automation offers an alternative to offshoring. For example, in a recent survey of the Chinese light-manufacturing sector, 31 percent of firms planned to upgrade production technology to cope with rising labor costs rather than invest in regions where labor is cheaper.⁵ As the cost of robots declines and adoption spreads in China, more Chinese firms will choose to automate, and accordingly, the window of opportunity for Africa to capture these jobs will narrow. Offshoring opportunities will not only disappear, but they will also make way for reshoring of production and jobs to more advanced economies.⁶

FIGURE 2

Kenya’s furniture manufacturing industry has about 25 years before it becomes more profitable to substitute robots for labor



Source: Banga and Velde 2018.

BUT OTHER ASPECTS OF AUTOMATION AND DIGITIZATION ARE CREATING UNPRECEDENTED OPPORTUNITIES FOR EMPLOYMENT AND INCLUSIVE GROWTH IN AFRICA

Clearly, automation is a challenge to the future of work in Africa, where the top priority is the large-scale creation of formal sector jobs for the 15 million⁷ young people entering the job market every year. That said, other aspects of the fourth industrial revolution are creating tremendous opportunities for employment in Africa. In the case of Kenya, a 2018 study documents the new jobs created during various stages of digitization, including the demand for agents and for technology experts to cope with the expansion of digital services.⁸ In addition, the use of transactions and savings data to price micro credit and assess credit risks has improved savings and increased access to credit for informal traders and poor households, spurring investment, growth of small and medium enterprises, and employment. Digital platforms are also boosting entrepreneurship and self-employment and providing new approaches to raising productivity in the informal sector. The possibilities offered by Uber or Lynk (the technology platform for informal sector workers in Kenya) are prime examples.

In addition to job creation, digitization has facilitated the development of platforms to address challenges in various sectors and accelerate economic development. It has disrupted the retail payments system. Economies are saving billions of dollars a year by using electronic payments and centralizing those payments. Digitization offers an easier platform to support financial inclusion and women's financial empowerment. Obstacles to accessing finance, such as physical distance, minimum balance requirements, little to no credit, and low-income flows can be circumvented. Savings have increased, micro-savers have opened bank accounts, and banks are now able to price short-term loans. Different products have been rolled out on digital platforms catering to other sectors of the economy, like energy and agriculture, to better reach a market segment or increase productivity. Products like M-Akiba for micro-investors in government securities, M-KOPA for solar energy supply, and the One Acre Fund or Hallo Tractor programs in agriculture are making a difference outside the financial sector, while others such as Eneza Education are enhancing learning using mobile phones. Digitization is also driving better revenue administration and service delivery.⁹

HARNESSING THE BENEFITS AND MANAGING THE CHALLENGES

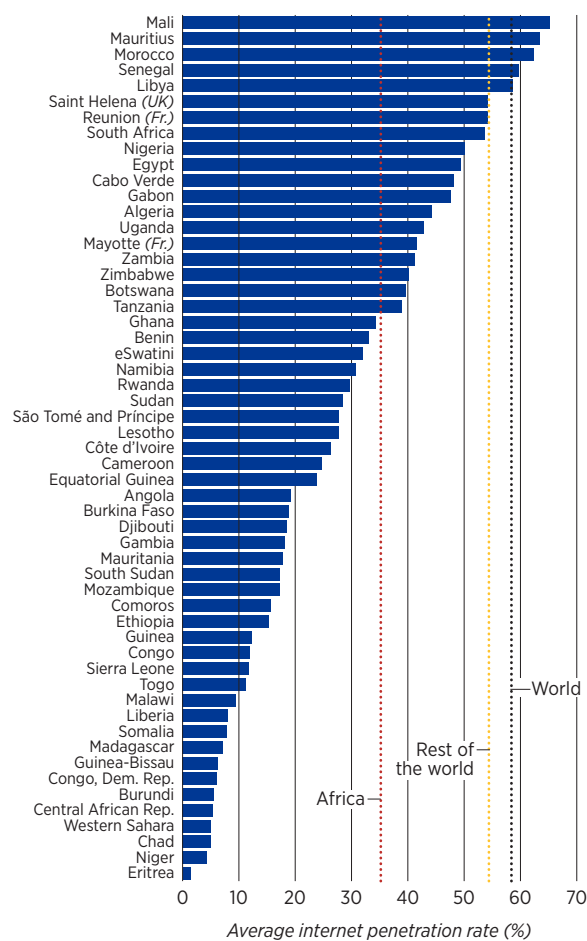
In sum, the fourth industrial revolution presents tremendous opportunities for Africa countries to leapfrog and address development problems with greater efficiency and at scale. The fourth industrial revolution is irreversible. It will affect every country and disrupt many sectors. The key is for African policymakers to harness the benefits of these technological innovations while managing the challenges they bring.

First, African policymakers should develop a full understanding of the new technologies and the opportunities and challenges they present for their economy and prepare a comprehensive digital agenda and strategy. Several governments have digital economy ministries. However, their


mandates are often loosely defined or too narrow. Digitization should be recognized as a vital cross-cutting sector that affects other areas, including education, infrastructure, transportation and logistics, and security and defense, among others. An economywide digitization strategy may begin with each ministry assessing the opportunities and challenges of digitization for its sector and then working closely with a specialized, equipped, and well-funded digitization ministry to implement a government-approved strategy.

Second, countries should develop the digital infrastructure to enhance connectivity and affordability as part of their digital agenda and strategy.

FIGURE 3
The average internet penetration rate is low in Africa, but there is wide variation, 2017



Source: <https://www.internetworldstats.com/stats1.htm>. Accessed on 12/03/2018.



Policymakers should aim to establish a robust digital infrastructure that includes broad-based internet connectivity. The average internet penetration rate in Africa is only 35 percent, far below the world average of 55 percent, through penetration rates vary widely across countries, from less than 2 percent in Eritrea to 65 percent in Mali (figure 3).¹⁰ Strategies for broader connectivity should go hand in hand with those of affordability to boost access. The cost of accessing the internet in Africa is the highest in the world, at \$119 a month, well above the global average of \$73. Costs vary widely across the continent, from less than \$50 a month in Algeria, Cameroon, Egypt, Mauritius, Morocco, and South Africa, below the cost in the United States, to higher than \$200 in Burkina Faso, Mauritania, and Namibia. The high cost of internet access limits the ability of many African economies to harness the full potential of digital technologies. Addressing connectivity and affordability will help lay the foundation for digitization.

Third, policymakers should adapt regulations to the rapidly changing environment. As new technologies disrupt traditional activities, lawmakers and regulators will have to play a delicate balancing act to ensure a regulatory environment that is healthy and robust yet still conducive to the adoptions of these technologies. If regulation fails to keep up, it could slow or stall adjustment of the economy to the new technologies. Countries' digitization strategies should incorporate plans to educate and retrain, as needed, regulators to impart the skills needed to carry out their duties efficiently.

Fourth, digitization strategies should ensure that education and training programs are upgraded, adapted, and expanded to keep up with the technical and higher-level skills demanded by the jobs of the digital economy. These skills increasingly include soft skills such as cognitive ability, socio-behavioral ability, and critical thinking. In the digital era, the old model of learn, work, and retire is giving way to one of continuing education, lifelong learning, and worker reskilling.¹¹ An African workforce that is unprepared for the digital age

will see the region's economies fall further behind in competitiveness and become marginalized from global value chains. The increasing complementarity between the new technologies and skilled labor as well as standard and infrastructure requirements throughout global value chains will make it more difficult for countries with unprepared workforces to participate in global manufacturing. A study by the Brookings Institution estimates that it will take almost 100 years for the average student in Sub-Saharan Africa to catch up to the average student in high-income countries.¹²

At the same time, new technologies offer opportunities for Africa to innovate and leapfrog in education and training, and many countries, including Kenya, South Africa, and Uganda, are hotspots of education innovation. The ability to leverage technology to maintain or boost the quality of education will become increasingly important as population growth strains education infrastructure and resources. As digitization makes inroads and disrupts the nature of work, policymakers ought to ensure that worker protection programs, and labor policies more broadly, respond to the needs of the new labor markets. The overall social contract between governments and populations may require upgrading.

Fifth, countries should adopt a multifaceted approach to structural transformation in response to premature deindustrialization and the increasing adoption of labor-saving technologies such as automation. In addition to developing traditional manufacturing sectors, countries should develop "industries without smokestacks." Research by the Brookings Institution's Africa Growth Initiative and the United Nations University World Institute for Development Economics Research finds that new technologies have spawned a growing number of service industries, including information and communication-based services, horticulture, tourism, and agrobusiness, that share characteristics with manufacturing and could be development escalators for African countries. In addition to being tradable, these sectors have higher productivity than agriculture and,

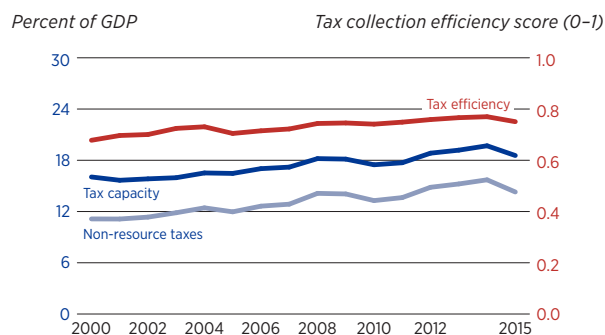
especially important, can absorb large numbers of moderately skilled workers. Like manufacturing, these services industries also benefit from technological change and economies of scale and agglomeration.

There is evidence of a growing role for these industries in some countries. For example, in Rwanda, tourism is the single largest export activity, accounting for about 30 percent of exports. Ethiopia, Ghana, Kenya, and Senegal are all integrated into global horticultural value chains, and Ethiopia has become a leading player in global flower exports.¹³ As these industries are not as exposed to automation, they offer an additional path for African policymakers to achieve large-scale job creation and accelerate structural transformation.

Sixth, countries should step up efforts to mobilize additional tax revenues to finance digitization strategies and the broader development agenda. Against the backdrop of low domestic saving rates and rising levels of debt, it is imperative to boost tax revenues. Although non-resource-based tax revenues have moved up in several African countries, to around 15 percent of GDP on average, they remain among the lowest in the world because of low tax capacities and inefficiencies in tax collection. The good news is that there is scope to raise tax revenues above the current levels by strengthening tax capacity and improving governance in revenue collection. A study by the Africa Growth Initiative at Brookings Institution estimated that tax capacity in Sub-Sahara Africa is about 20 percent of GDP, up somewhat from 16 percent in the early 2000s but well below the 30 percent for OECD countries (figure 4).¹⁴ Policies to strengthen tax capacity should remain a medium- to long-term policy objective, given that capacity is largely determined by entrenched structural factors such as the stage of economic development, size of the informal sector, and sectoral composition of economic activity.

Improving governance, on the other hand, can yield near-term results. The study found that strengthening governance, including combating

FIGURE 4
Tax revenue, tax capacity, and efficiency in Sub-Saharan Africa



Source: Coulibaly and Gandhi (2018).
Note: Averages based on an unbalanced panel. Some countries are missing data for 2015.

corruption and bolstering accountability, to the global median (still below OECD scores) can significantly reduce inefficiencies and help increase tax revenues by 4 percentage points of GDP on average. These additional tax revenues amount to \$110 billion annually, on average, over the next five years. Enhancing public financial management, including the efficiency and equity of public spending, will also help. Citizens are more likely to comply with tax collection when they trust that tax revenues are managed well.¹⁵

Modern information and communication technologies also offer avenues to support tax revenue mobilization. For example, digitization presents opportunities to formalize informal businesses, expand the tax base, and increase tax capacity. Typical interventions include the provision of financial services, credit access, entrepreneurship training, and business support services.¹⁶ Simplifying processes and reducing the cost of formalization can help firms make the transition to the formal sector. Similarly, technology can be leveraged to enhance the efficiency of tax collection by modernizing and streamlining tax collection processes, reducing compliance costs, enforcing collection, sealing leakages, and so on. Encouragingly, several countries, including Ethiopia, Liberia, and Rwanda, have moved in this direction by adopting electronic platforms for filing, reporting, or paying taxes.

In contrast, recent decisions in some countries, including Kenya, Tanzania, and Uganda, to raise tax revenues by increasing taxes on mobile transactions have the potential to slow or reverse gains in digitization and financial inclusion. The benefits of these platforms, ranging from financial inclusion to formalization of economic activities, far outweigh the short-term gains from taxes levied on mobile transactions. These tax policies should be informed by comprehensive cost-benefit analyses. Mobile transactions remain a very small share of total electronic payments, with limited potential to boost tax revenues but with great importance to low-income populations who rely solely on these services. Tax policies should be designed to encourage and facilitate digitization not to slow or stall it. The platforms offered by mobile phones and similar digital media for transactions ought to be nurtured.

Finally, the digitization agenda should be carried out with greater urgency. As correctly noted by Canadian Prime Minister Justin Trudeau at the World Economic Forum, “the pace of change has never been this fast, yet it will never be this slow again.” The scale of the disruption associated with new technologies will only grow with time. While Africa has demonstrated the ability to innovate and be a leader in leapfrog development, the scale of the challenge will require a more concerted and coordinated efforts led by African governments and civil societies with strong support from development partners and institutions and private sector participation. A successfully digitized Africa will yield tremendous socioeconomic benefits for Africa and the global economy.

NOTES

1. Qureshi 2017.

2. IMF 2017.

3. Dervis and Chandy 2016.

4. Banga and Velde 2018.

5. Banga and Velde 2018.

6. For example, between 2010 and 2016, 1,978 U.S. companies re-shored production back to the United

States causing a loss of 290,797 jobs in other countries, including 885 jobs in Africa.

7. ILO 2018.

8. Ndung'u 2018.

9. Brookings Institution 2018.

10. The penetration rate for other regions: North America (95 percent), Europe (85 percent), Australia and Oceania (69 percent), Latin America and Caribbean (67 percent), Middle East (65 percent), and Asia (49 percent).

11. Qureshi 2017.

12. McGivney Winthrop and 2015.

13. Coulibaly 2018.

14. Coulibaly and Gandhi 2018.

15. Barone and Mocetti 2011.

16. Grimm 2016.

REFERENCES

Brookings Institution. 2018. *Foresight Africa: Top Priorities for the Continent in 2018*. Washington, DC: Africa Growth Initiative at Brookings.

Banga, K., and D. Velde. 2018. *Digitization and the Future of Manufacturing in Africa, SET Report*. London, UK: Overseas Development Institute.

Barone, G., and S. Mocetti. 2011. “Tax Morale and Public Spending Efficiency.” *International Tax and Public Finance* 18 (6): 724–749.

Coulibaly, B. 2018. “Africa’s Alternative Path to Development.” Prague, Czech Republic: Project Syndicate.


Coulibaly, B., and D. Gandhi. 2018. “Mobilization of Tax Revenues in Africa: State of Play and Policy Options.” Policy Brief, Africa Growth Initiative at Brookings, Washington, DC.

Dervis, K., and L. Chandy. 2016. “Are Technology and Globalization Destined to Drive Up Inequality?” Eleven Global Debates, Brookings Institution, Washington, DC.

Grimm, M. 2016. “What Interventions Create Jobs? A Review of the Evidence.” In L. Chandy (Ed.), *The Future of Work*. Washington, DC: Brookings Institution.

ILO (International Labour Organization). 2018. *World Employment and Social Outlook*. Geneva.

IMF (International Monetary Fund). 2017. *Regional Economic Outlook*. Washington, DC.

- 
- McGivney, E., and R. Winthrop. 2015. “Why Wait 100 Years? Bridging the Gap in Global Education.” Washington, DC: Brookings Institution.
- Ndung’u, N. 2018. “Next Steps for the Digital Revolution in Africa: Inclusive Growth and Job Creation Lessons from Kenya.” Working Paper 20, Africa Growth Initiative at Brookings, Washington, DC.
- Nedelkoska L., and G. Quintini. 2018. “Automation, Skills Use and Training.” OECD Social, Employment and Migration Working Paper No. 202, Paris.
- Qureshi, Z. 2017. “The Not-So-Dire Future of Work.” Prague, Czech Republic: Project Syndicate.

DIGITIZATION FOR JOB CREATION AND INCLUSIVE GROWTH

Njuguna Ndung'u

African Economic Research Consortium

Digitization has influenced financial inclusion and financial development across all sectors of the Kenyan economy. Has it produced ripple effects in inclusive growth and employment generation? Its support for inclusive finance is clear, but its effect on employment generation requires research into further survey data.

Jobs through macroeconomic channels

At the macro level, increased financial inclusion through mobile payments contributes to greater capital accumulation and investment, with potential for job creation. Digital technology creates significant spillovers on local demand for services: one additional technology job creates an estimated five new jobs in the local nontradable sectors.¹ Since most employment in low- and middle-income countries is in micro, small, and medium enterprises, interventions often target these firms to support their formalization, growth, and job creation. Typical interventions include credit access, wage subsidies, finance services, entrepreneurship training, business support services, and measures that transform the business environment.² Digitization provides a platform for such interventions.

The digital evolution in financial services has shortened savings-investment

cycles, and investments have the potential to increase output, reduce poverty, and generate employment growth. For instance, a randomized evaluation trial in rural western Kenya studied a new “commitment” savings service (in which savers give up their right to withdraw until they have reached a self-specified goal). Access enabled female market vendors to mitigate the effects of health shocks, increase food expenditure for the family (private expenditures went up by 13 percent), and increase investments in their businesses by 38–56 percent compared with female vendors without access to a savings account.³

Digitization has reduced information asymmetry in the financial sector and in the labor market, increasing the efficiency, certainty, and security critical to economic growth and job creation. Digital financial services leave tracks of financial transactions that banks use to determine the creditworthiness or generate credit scores for their customers. Virtual savings accounts and virtual credit supply platforms such as M-Shwari, M-Kesho, Tangaza, Mobicash, and KCB M-PE-SA enable the use of transaction and savings data to price micro credit and assess credit risks. Information symmetry lowers the risk premium and search costs built into the cost of credit by the financial institutions. Thus, credit information sharing has promoted access to

affordable credit in Kenya, including access for small traders so they can sustain or expand their business and thus create employment opportunities across the country.

Digital platforms also facilitate information sharing about financial products between financial institutions and their customers. So, they increase financial inclusion and financial intermediation. Digital platforms also allow financial regulators to improve the anti-money laundering and combating the financing of terrorism regime. This creates vibrancy and confidence in the financial system, spurring savings and investment, which generate employment opportunities. Retail electronic payment platforms at the macro and micro level contribute to economic efficiency, prompting production efficiency, though it is still difficult to measure.

Jobs through micro channels

The evolution of financial services in Kenya provided evidence of endogenous development and financial sector vibrancy. Increased activity has added participants and service providers and thus added employment opportunities. For example, the emergence of electronic payments created the need for a variety of jobs at different levels, including agents, master agents, and super agents.

FOCUS 8

The agents, supervised by the telecommunications companies, transform cash into electronic units of money and load it into SIM cards. The master agents, also referred to as aggregators, serve the agents in a given locality as liquidity distributors. The master agents are institutions that recruit “Lipa na M-Pesa” (“pay with M-Pesa”) merchants and provide them with added-value services such as credit and reconciliation services. Super agents mainly purchase electronic floats from the telecommunication companies in bulk and distribute them to the agents. The super agents are banks, microfinance institutions (MFIs), or chain supermarkets with no transactions limits, and they are interoperable across MNOs. This setup has created employment for thousands of Kenyans in the digital ecosystem (figure 1).

The number of mobile financial services agents in the country has grown tremendously from 307 in 2007, when M-Pesa was launched, to 182,472 as of December 2017. Of those, 152,077 (or 83.3 percent) were M-Pesa (Safaricom) agents, whereas the combined agents for all other

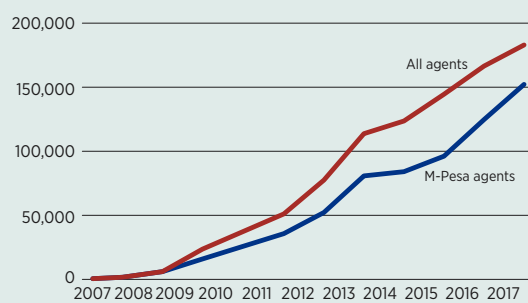
MNOs and MVNOs were only 30,395 (or 16.7 percent). Huge investments, returns, and employment opportunities have grown with this ecosystem.

Virtual banking through integration with commercial banks also increased the demand for employees, since branch outlet expansion created employment opportunities, including for information technology experts. The use of transactions and savings data to price micro credit and assess credit risks led to improved savings and increased access to credit by informal traders and poor households, spurred them to invest, and thus resulted in small and medium enterprise (SME) growth that continues to create employment across the country. By adding cross-border payments and regional payments, Kenyan banks successfully replicated their products in the East African Community. M-Pesa and M-Shwari have been replicated in Tanzania, M-Pawa created in Uganda, and Mo-Kash in Rwanda with similar success. Growing agent networks across the region have created employment opportunities.

As shown by the growing number of mobile phone financial service agents and the establishment of agency banking in the financial sector in Kenya, digitization promotes job creation as the digital financial ecosystem provides a platform for the emergence of new businesses and growth of existing ones. Agency banking, launched in 2010, complemented the commercial bank branch network in Kenya. In agency banking, an entity, contracted by a commercial bank and approved by the Central Bank, provides limited banking and financial services to an underserved population on behalf of the commercial bank. The agency banking model has allowed banks to place nontraditional outlets in remote areas where bricks-and-mortar branches and other outlets are not financially feasible. The agency network for banks has increased to over 35,000 entities since inception. This development has presented an opportunity to small entrepreneurs, such as those operating retail shops and service stations, to offer agency banking services to their customers, thus enhancing SME operations and creating more employment opportunities across the country.

FIGURE 1
Mobile financial services agents in Kenya

Number of agents



Source: Central Bank of Kenya.

Digitization has also enabled the establishment of online shopping platforms. E-commerce platforms free traders from having to establish physical shops all over since customers can log on to their websites, view and purchase their products, and wait for the products to be delivered at their convenience. Online shopping malls have been established, to the convenience of many shoppers, besides the physical shops at supermarkets across the country. And online shopping has created job opportunities for

individuals and firms offering door-to-door delivery services.

Kenya's online shopping platforms include Jumia Kenya, PigiaMe, Nuria, OLX, and Kilimall, enabled by the digital platform to save on operational costs as they market products, engage with their customers through digital financial services, and deliver products. Other opportunities on the digital platform range from self-employment in Uber ride-share services to YouTube channels to Amazon self-published books to applications sold through stores, also referred to as "digital consignment."⁴

The government of Kenya launched Ajira Digital Program to create employment opportunities for youth. It links companies to a community of online workers in Kenya who use the internet to find, complete, and submit work. Through the program, businesses can contract for freelance services at individual or firm level. More than 40,000 Kenyans are already registered on Upwork, the leading freelance platform, and are participating in online work. A 2014 survey that covered Upwork (then called "oDesk"), ranked Kenya 10th among countries providing online workers, and 1st in Africa.

Additionally, freelance writing jobs entail research and writing for academic projects, where online writers work in their fields of specialization. The client presents the writer with a topic to research, the terms of payment, and the assignment's time frame. Upon completion of the assignment, the writer is paid through PayPal, Skrill, or Payoneer.

Informal and formal employment

In economies such as Kenya's, with diverse market segments, starting with a preference for informal markets, the digital platform can move them to the more complex formal markets, where their growth, productivity gains, and employment creation can have immense impact. Creating new jobs that offer gainful employment and decent working conditions is a major challenge faced by low- and middle-income countries.⁵ In Kenya, the share of employment in the informal sector has been larger than in the formal sector since the early 1990s.⁶ Digitization presents an opportunity to formalize informal sector businesses and move them to gainful employment. Through simple payment platforms and accessible markets, digitization brings hope that informal markets in Kenya and throughout Africa will one day accept the complexities of formal transactions. African economies are predominantly characterized by large informal sectors, and so far formalization has not

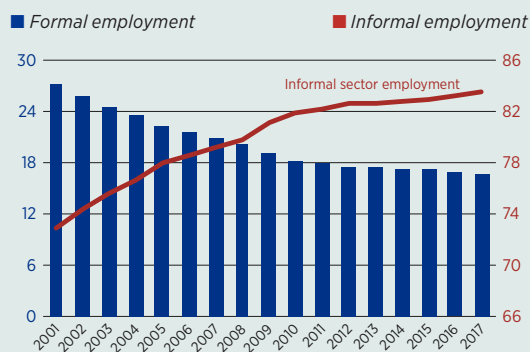
succeeded in any of them. But the informal sector is increasingly using retail electronic payments, virtual savings, and virtual credit supply platforms, so gradually, digitization appears to be formalizing informal sector activities.

M-Pesa and the emerging payments platforms support coordination across market segments. Market segments can communicate across each other through a single retail electronic payment platform allowing for market and production vibrancy. The proportion of formal employment in Kenya declined between 2001 and 2017 from 27.1 percent to 16.6 percent (figure 2). The proportion of informal sector employment in Kenya increased from 72.8 percent to 83.4 percent.

Informal employment growth accelerated between 2008 and 2012 but has slowed down since. The acceleration coincided with when digitization took off in Kenya's financial sector. So, digitization created potential for increased informal employment. In an economy

FIGURE 2
Formal and informal employment in Kenya, 2001–17

Proportion of employment (percent)



Source: Kenya Economic Survey (Republic of Kenya 2006; 2010; 2014; 2018).

FOCUS 8

with huge unemployment, especially for youth, where the informal sector seems to be the sector to absorb them, digitization provides an easy application for self-employment. This improves informal market operations and increases labor absorption.

Although the quality of informal employment cannot be discerned from available statistics, it is expected to have improved, since the digital platforms present an opportunity for informal businesses to formalize. Empowerment comes from digitization: greater and deeper access to information and resources can reduce the share of informal businesses in an economy.⁷

Net job creation

Given digitization's transforming relations between workers (labor) and employers (capital), the result could be job creation or destruction, depending on the nature of work. Digitization seems to increase the supply of sustainable business models that affect the economy and are sustainable because they operate in critical sectors that touch on household livelihoods. Where digitization fully automates services, job losses are expected. Technology augments higher skills while replacing routine jobs, forcing many workers to compete for low-paying jobs.⁸ For instance, internet banking services and e-commerce platforms (where traders do not necessarily have to establish physical shops all over) could mean layoffs of certain cadres of staff. However, digitization is unlikely to destroy large numbers of jobs. In a study of 21 OECD countries, only 9 percent of jobs were automatable, so the threat of

job destruction from technological advances seems moderate.⁹

In Kenya, a closer look at the effects of digital innovation suggests more job switching than job destruction. The main opportunities for income generation in an excess capacity environment do not destroy jobs but create them, suggesting a net increase in job creation. For example, while online shopping platforms gain ground in Kenya, physical shopping malls—occupied mainly by supermarkets and market stalls for small traders—continue to be established in towns across the country. In fact, traders with shops take advantage of online shopping platforms to reach more customers and deliver products purchased without visiting. This also increases opportunities for door-to-door delivery services. In the financial sector, agency banking, which seems to ride on the mobile phone-based financial services agent network, has also created job opportunities across the country, surpassing the likely loss of bank teller jobs due to online banking. As more data appear, a clear picture will emerge, expected to show positive results relating digitization and net job creation.

Notes

This spotlight is abridged from Ndung'u (2018).

1. Frey and Rahbari 2016.
2. Grimm 2016.
3. Dupas and Robinson 2013.
4. El-Darwiche et al. 2013.
5. Grimm 2016.
6. Ikiara and Ndung'u 1999.
7. Garcia-Murillo and Velez-Ospina 2017.
8. World Bank 2016.
9. Arntz, Gregory, and Zierahn 2016.

References

- Arntz, M., T. Gregory, and U. Zierahn. 2016. "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis." OECD Social, Employment and Migration Working Paper No. 189, Paris, France.
- Dupas, P., and J. Robinson. 2013. "Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya." *American Economic Journal: Applied Economics* 5 (1): 163–192.
- El-Darwiche, B., R. Friedrich, A. Koster, and M. Singh. 2013. *Digitization for Economic Growth and Job Creation: Regional and Industry Perspectives*. New York, NY: Booz & Company.
- Frey, C., and E. Rahbari. 2016. "Do Labor-Saving Technologies Spell the Death of Jobs in the Developing World?" Prepared for the 2016 Brookings Blum Roundtable.
- Garcia-Murillo, M., and J.A. Velez-Ospina. 2017. "ICTs and the Informal Economy: Mobile and Broadband Roles." *Digital Policy, Regulation and Governance* 19 (1) 58–76.
- Grimm, M. 2016. "What Interventions Create Jobs? A Review of the Evidence." In L. Chandy (Ed.), *The Future of Work in the Developing World*. Washington, DC: Brookings Institution Global Economy and Development Program.
- Ikiara, G.K., and N.S. Ndung'u. 1999. "Employment and Labor Markets During Adjustments: Kenya." In W. Geest and R. Hoeven (Eds.), *Adjustment Employment and Missing Institutions in*



Africa: The Experience in Eastern & Southern Africa. Geneva, Switzerland: International Labor Office.

Ndung'u, N. 2018. *Next steps for the digital revolution in Africa: Inclusive growth and job creation lessons from Kenya.* Africa Growth Initiative at Brookings Working Paper 20. Washington, DC: Brookings Institution.

Republic of Kenya. 2006. *Economic Survey.* Nairobi, Kenya: Kenya National Bureau of Statistics, Government Printers.

———. 2010. *Economic Survey.* Nairobi, Kenya: Kenya National Bureau of Statistics, Government Printers.

———. 2014. *Economic Survey.* Nairobi, Kenya: Kenya National Bureau of Statistics, Government Printers.

———. 2018. *Economic Survey.* Nairobi, Kenya: Kenya National Bureau of Statistics, Government Printers.

World Bank. 2016. *Digital Dividends: World Development Report 2016.* Washington, DC.

This report brings together some of the world's leading labor and development economists to provide specific policy recommendations for creating decent jobs.

Traditional remedies to unemployment and underemployment focus on the removal of distortions in the business environment. But the policy agenda underpinning them, which aims at making the existing labor market more flexible, can be difficult to implement, as it often requires time and considerable political capital. Policymakers need to recognize that their meager government budgets and administrative capacity must be allocated not to generic, broad-based reforms or to vaguely defined "priority sectors," but to an initial small number of strategically targeted programs, reforms, and industries in which private firms can emerge and become competitive domestically and internationally, and create strong demand for formal sector employment.

New technological developments combined with human creativity provide policymakers with new possibilities to address pervasive problems of unemployment and underemployment, disorderly migration, and environmental degradation. In the African context, the primary goal of an effective growth-enhancing, job-creating strategy should be to lift the 80–90 percent of people now in low-productivity or subsistence activities into industry, including agro-industrial business and some new tradable services. Manufacturing provides more long-term economic benefits than other activities. It generates economies of scale, sparks industrial and technological upgrading, fosters innovation, and has big multiplier effects, with each factory requiring accountants, marketing people, component suppliers, restaurants, and other services.

The report also sheds light on the role of prudent macroeconomic policies, and shows how best to use special economic zones, industrial parks, agro-processing zones, skill enhancement zones, and apprenticeship and incubation programs.

African Development Bank Group
Avenue Joseph Anoma
01 BP 1387 Abidjan
Côte d'Ivoire
www.afdb.org

ISBN 978-0-9765655-3-6



9 780976 565536