International Labour Organization

Global Employment Policy Review 2025

Do employment-responsive policies work?

How impact assessments, diagnostics and dialogue contribute to the answer

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International Labour Office, Geneva

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Preface

The *Global Employment Policy Review* (GEPR) is a biennial publication prepared by the ILO. The purpose of the GEPR is to advance the ILO's contribution to global employment policy debates by giving greater visibility to current policy-oriented research, as well as to spur new policy-oriented research. The GEPR brings together contributions from affiliated researchers as well as the ILO's wider global employment policy team. This includes ILO colleagues both at headquarters and in field offices, with the latter providing a solid regional perspective on economic policy debates.

At the core of the GEPR are a set of thematic chapters that address both persistent and emerging policy challenges and do not shy away from challenges that are difficult or indeed contentious. Each chapter is meant to be self-contained and to represent the viewpoints of the respective authors. In this sense, it is a "review" rather than a "report" in the usual sense of the word. At the same time, the chapters have been selected to best demonstrate the ILO's current thinking on global employment policy challenges, while endeavouring to present clear policy messages. The GEPR places a special emphasis on policy design and implementation so that its chapters will have as much relevance as possible to countries in the process of developing and implementing employment policies.

Acknowledgements

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Abbreviations

AfDB	African Development Bank
ALMPs	active labour market policies
CGE	computable general equilibrium
COFOG	classification of the functions of government
DID	difference-in-difference
DW	decent work
ECB	European Central Bank
EmpIA	employment impact assessment
ER	expenditure review
ERPE	employment-related public expenditure review
ETUC	European Trade Union Confederation
EU	European Union
FACB	freedom of association and collective bargaining
FDI	foreign direct investment
FH	Freedom House
FI	financial institution
GDP	gross domestic product
GEM	general equilibrium model
GEPR	Global Employment Policy Review
GFCF	gross fixed capital formation
GIS	geographic information systems
HCT	human capital theory
HPWS	high-performance work systems
IMF	International Monetary Fund
INFF	integrated national financing framework
ITUC	International Trade Union Confederation
LFS	labour force survey
MSME	micro, small and medium-sized enterprise
MTEF	medium-term expenditure framework
MTFF	medium-term fiscal framework
NCRP	Nacala Road Corridor Project
NDP	national development plan

NTL	nighttime lights
OECD	Organisation for Economic Co-operation and Development
PEB	pro-employment budgeting
PPML	Poisson pseudo maximum likelihood
RBB	results-based budgeting
RCT	randomized controlled trial
SAM	social accounting matrix
SDG	Sustainable Development Goal
SME	small and medium-sized enterprise
SMSD	structural model for sustainable development
SUT	supply and use table
TBML	tree-based machine learning
TUR	trade union rights
TVET	technical and vocation education and training
VIIRS	visible infrared imaging radiometer suite
WTO	World Trade Organization

Introduction

The title of this third edition of the *Global Employment Policy Review* makes explicit a question that was implicit in the two prior editions (ILO 2020, 2023) – that is, "Do employment-responsive policies work?" The GEPR was created by the ILO to provide critical perspectives on the design and implementation of employment policies. In this regard, this edition of the GEPR focuses on the contributing role of impact assessments, diagnostics and social dialogue among its tripartite constituents. The report also addresses policy-coordination dialogue among different entities within governments as well as dialogue among international organizations working on impact assessments.

This report is intended for researchers and academics, other international organizations and the general public with an interest in the creation of decent jobs. Given the report's themes, it is particularly hoped that it will prove useful to policymakers in government and to employers and workers and their respective organizations.

The chapters of the GEPR 2025 are as follows:

- Chapter 1: Employment impact assessment: An ILO perspective
- Chapter 2: Macroeconomic policies for structural and social transformation: From diagnostics to dialogue
- Chapter 3: Financing development: The role of pro-employment budgeting and employment-related public expenditure reviews
- Chapter 4: Assessing the economic and social dimensions of policies: Some applications of the structural model for sustainable development
- Chapter 5: Economic and social impacts of transport corridor investments: A GIS data analysis for Kenya and Zambia
- Chapter 6: The impact of trade union rights on trade: An industry-level approach
- Chapter 7: Building skills ecosystems for sustainable productivity improvements

This introduction closes with a summary of each of these chapters, yet it seems helpful from the outset to have a sense of how they relate to each other and structure the report. Chapters 2 and 3 present diagnostics addressing both employment and social protection policies. Chapters 4 and 5 present impact assessments addressing both employment and social protection outcomes. Chapter 6 is also an impact assessment, but focusing on the impact of trade union rights (TUR) on exports at the aggregate and industry levels. Finally, Chapter 7 provides a critical overview of skills policies and their role in increasing productivity. Chapters 2, 3 and 4 are highly relevant for macroeconomic policies and Chapters 4 and 6 for sectoral/industrial and structural transformation policies, in that they build on sectoral data and approaches. Meanwhile, Chapter 7 complements a chapter in the 2020 edition of the GEPR on skills policies and trade. In this sense, this third edition of the GEPR provides continuity with its previous editions, also through its emphasis on illustrative country cases.

Jobs have been central to the ILO's mandate since its foundation over 100 years ago, and the ILO has been joined in recent years by leading international financial institutions (FIs) – such as the International Monetary Fund (IMF) and the World Bank Group, which have reoriented their policies to also prioritize jobs.[1] What distinguishes the ILO in this regard is its comprehensive view of jobs and correspondingly comprehensive view of employment-responsive policies. These views are guided by the ILO's Decent Work Agenda and its Employment Policy Convention, 1964 (No. 122), of which Article 1 states:

> "With a view to stimulating economic growth and development, raising levels of living, meeting manpower requirements and overcoming unemployment and underemployment, each Member shall declare and pursue, as a major goal, an active policy designed *to promote full, productive and freely chosen employment* [emphasis added]."

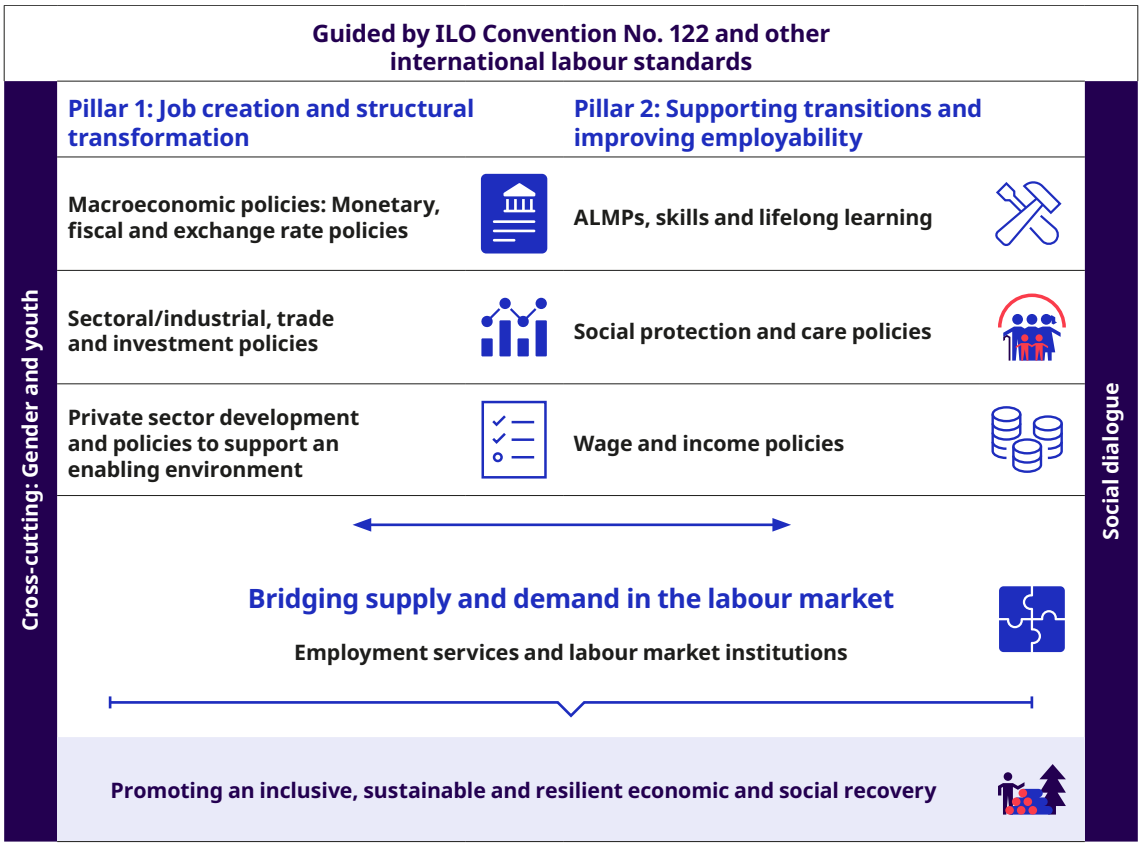
The ILO's comprehensive view of employment-responsive policies is also guided by other ILO Conventions and Recommendations, such as those promoting social dialogue, improved job quality, stronger rights at work and the expansion of social protection. International labour standards – defined by the ILO's Conventions and Recommendations created through tripartite consultation – are the raison d'être for the organization and the foundation for decent jobs.

1 For example, the 2025 meeting of the Development Committee of the IMF and World Bank is titled "Jobs: The Path to Prosperity".

The ILO provides a unique setting for social dialogue, enabling the development of employment-responsive policies that are informed by the indispensable experiences and perspectives of its tripartite constituents. Tripartite discussions at the International Labour Conference have resulted in the consensus that macroeconomic policies are an essential component of comprehensive and inclusive employment policies. A recurrent discussion on employment at the International Labour Conference in 2022 stressed the need to design macroeconomic policies that go well beyond inflation targeting and include the objectives of creating decent jobs and ensuring social justice, in line with Sustainable Development Goal (SDG) 8 to "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (ILO 2022).

The scope of the ILO's employment-responsive policies is illustrated by figure 1. Under Pillar 1 on job creation and structural transformation are: macroeconomic policies; sectoral/industrial, trade and investment policies; and private sector development policies. Under Pillar 2 on supporting transitions and improving employability are: active labour market policies (ALMPs) and skills and lifelong learning policies; social protection and care policies; and wage and income policies. Both pillars are supported by employment services and labour market institutions and guided by social dialogue and the cross-cutting objectives of gender and youth. The coupling of employment and social protection policies is also embodied in the United Nations (UN) initiative of the Global Accelerator on Jobs and Social Protection for Just Transitions, and its objective of accelerating progress towards the SDGs through the joint goals of decent job creation and social protection extension.[2] The ILO has played a strategic role in the Global Accelerator – consistent with its broad definition of employment-responsive policies as well as the definitional overlap

▶ **Figure I1. Scope of ILO's employment-responsive policies**



Source: ILO (2022).

2 See Global Accelerator on Jobs and Social Protection for Just Transitions.

between decent jobs and social protection – in that the provision of basic social protection is one of the defining characteristics of a decent job. Readers will find that employment and social protection policies and objectives feature strongly in this edition of the GEPR, specifically in Chapters 2 and 3 on diagnostics and Chapters 4 and 5 on impact assessments.

This edition of the GEPR delves deeply into impact assessments. The key concept and challenge of impact assessments is *attribution*. That is, even when causality can be established from employment-responsive policies to desired outcomes, how much of the change in outcomes can be attributed to these policies in the face of the multiple factors affecting these outcomes? In this sense, impact assessments provide the most direct answer to the question of the extent to which employment-responsive policies do indeed work. Yet, impact assessments and diagnostics are closely linked, since diagnostics provide guidance on the design and financing of employment-responsive policies (as exemplified by Chapters 2 and 3), while impact assessments are necessary to measure their effectiveness.

Chapter summaries

Chapter 1. Employment impact assessment: An ILO perspective

Authors: Rossana Galli, David Kucera and Meili Fortunee Tuyisenge

Chapter 1 provides a review of nearly 100 employment impact assessment (EmpIA) studies undertaken by the ILO, based on the coding of their substance and the extent to which they document social dialogue. It is intended as a companion and complement to the ILO's *Reference Guide on Employment Impact Assessment* (ILO 2025). The chapter summarizes interviews with ILO colleagues at headquarters and in regional offices, based on their experiences with undertaking EmpIAs and endeavouring to institutionalize them at the national level, with an emphasis on the role of social dialogue in doing so.

The chapter describes key aspects of the work of the STRENGTHEN2 project, a joint initiative of the European Union (EU) and the ILO that has played a central and strategic role in the ILO's work on EmpIA. Though the work of the project is wide-ranging, the chapter focuses on its engagement with FIs through a series of workshops, which have promoted mutual learning and resulted in an increased appreciation among the FIs of the ILO's expertise in EmpIAs, as exemplified by the innovative methods applied in Chapters 4 and 5. The chapter closes by describing a series of training events on EmpIA undertaken by the International Training Centre (ITCILO), the training arm of the ILO, as well as the STRENGTHEN2 project. These training events are aimed to meet ILO constituents' growing demand for impact assessments and to build capacity to support their institutionalization at the national level, including "soft" institutionalization that enables constituents to more effectively plan and manage impact assessments.

Chapter 2. Macroeconomic policies for structural and social transformation: From diagnostics to dialogue

Authors: Luca Fedi, Iyanatul Islam and Sher Verick

Chapter 2 is a companion to ILO's *Macroeconomic diagnostics for decent jobs, social protection and just transitions: A practitioners' guide* (ILO 2024). The central theme is the role of dialogue in the development of macroeconomic policies, addressing not only social dialogue among the ILO's tripartite constituents but also dialogue within governments, involving labour and other key line ministries. Context is provided by estimates of financing gaps for different regions of the world to attain the SDGs by 2030 as well as universal social protection. The chapter describes the disillusionment with traditional macroeconomic policy's narrow emphasis on price stability, not least because of the counterexamples of the successful development trajectories of countries in Asia that relied heavily on industrial policy. Four principles for developing country-level macroeconomic policies are presented: accelerating progress on the SDGs depends on macroeconomic policy choices; macroeconomic policies need to go beyond an emphasis on price stability and to be more proactive in the short run and engaged in the long run; there is no "one size fits all" macroeconomic framework for all countries; and policy dialogue needs to be informed by evidence for the country while also receptive to lessons from other countries.

The chapter argues that proactive macroeconomic policies, which seek to promote economic and social transformation, require broad policy dialogue among a broad range of stakeholders. Beyond monetary and fiscal aggregates, macroeconomic policy needs to be concerned with a broader scope of *macro-critical policy issues* encompassing labour and

social policies, and industrial, trade and investment policies. Two country examples are reviewed to document wide-ranging policy and social dialogue in the context of post-COVID-19 recovery programmes. A number of additional cases of good (if not ideal) practice regarding broad stakeholder engagement in the development of country-level macroeconomic policies are documented. The chapter notes, from a review of such cases in developing and high-income countries, that there are broad areas of convergence between the interests of workers' and employers' organizations, encompassing high levels of public investments, low interest rates and a competitive currency, fiscal stimulus in downturns, industrial policy and spending on skills and education. The chapter points to the important role of employment policy expenditure reviews and macromodelling in these respects, motivating Chapters 3 and 4.

Chapter 3. Financing development: The role of pro-employment budgeting and employment-related public expenditure reviews

Authors: Eléonore d'Achon, Mauricio Dierckxsens and Kee Beom Kim

As with Chapter 2, this chapter is motivated by the financing gaps to attain the SDGs, especially in the context of the low tax revenues as a share of gross domestic product (GDP) in emerging economies – and, even more so, low-income countries – compared with advanced economies. Among the key domestic factors discussed that contribute to these financing gaps in developing countries are weak taxation systems, large informal economies, rapidly rising public debt-to-GDP ratios, and weak patterns of structural transformation, alongside external factors which pose additional challenges. The chapter addresses the role of pro-employment budgeting with a focus on employment-related public expenditure reviews (ERPEs) as means of addressing these financing gaps. Broadly speaking, pro-employment budgeting (PEB) is an approach which aims to place employment at the core of the planning and budgeting process. It addresses how a government budget (expenditure and revenues) should be designed to more effectively move towards stated employment policy objectives. ERPEs are one of the various tools and entry points under PEB. It provides an analysis of government expenditures with respect to employment policy objectives. With ERPEs providing a key input into PEB, together these tools provide a means of addressing the mismatch between employment policy goals and the budgetary means to achieve them, particularly in the context of constrained fiscal space. A core contribution of the chapter lies in reframing employment not as a by-product but as a primary objective of public budgeting – an approach that remains novel in the field of expenditure reviews and public financial management. In a context of constrained fiscal space, the chapter emphasizes budget-neutral reallocations rather than increases in fiscal space as a means of addressing financing gaps.

Though ERPEs rely on a structured approach to expenditures, undertaking them can pose real challenges given the cross-cutting nature of employment policy goals and the fact that employment-related expenditures are often not explicit in government budgets. The chapter discusses five thematic areas that need to be addressed to undertake ERPEs. These are: social protection systems; ALMPs; sectoral and regional policies; micro, small and medium-sized enterprise (MSME) development; and investments in people's capabilities. The chapter presents a number of country examples of ERPEs, drawing from one of the co-author's experiences of undertaking ERPEs in six countries (see Robalino and d'Achon 2023).

The chapter also discusses the benefits of the classification of the functions of government (COFOG) for facilitating ERPEs and, in turn, the development of pro-employment budgets. A key contribution of the chapter is in discussing the sequence of strategic entry points for PEB in the broader government budget cycle. These entry points are: developing a PEB framework, including dialogue with the ILO's social partners; PEB preparation and execution; monitoring; and auditing with external oversight and accountability. EmpIAs play a significant role in this process, particularly ex-ante assessments for developing a PEB framework and ex-post assessments for monitoring.

Chapter 4. Assessing the economic and social dimensions of policies: Some applications of the structural model for sustainable development

Authors: Xiao Jiang and Massimiliano La Marca

Chapter 4 introduces the key features of the ILO's structural model for sustainable development (SMSD) and presents three country-level applications that assess the impact of policy interventions and investment operations, with a particular focus on employment and social outcomes. The SMSD is an economy-wide sectoral disaggregated model built on national accounts, labour and household microdata. Social accounting matrices (SAMs) are the main data set with detailed disaggregation of products and activities; of economic actors, such as households, enterprises, the government; and of employment by occupation and formality status. Though based on SAM data, the model outcomes do not rely on traditional SAM multipliers, which mechanically reflect the effects of final demand on unconstrained production and consumption levels. The model also departs from conventional computable general equilibrium (CGE) models that are dominated by assumptions about well-functioning price and wage clearing mechanisms or rigidities in the labour markets. The SMSD is a "structuralist" model, as its core elements and assumptions reflect persistent country-specific characteristics in production, investment and consumption, as well as socio-economic relations between actors, and their typical behaviours. This requires diverse adjustment mechanisms and accounting for the behaviour of key actors, while addressing constraints on productive capacity. It further considers the long-term economic and social impacts of policy interventions designed to remove these constraints.

A scenario analysis for Namibia highlights the key impacts of policies aimed at expanding mining sector exports and enhancing social sustainability. The analysis examines effects on real incomes for households and institutions, fiscal space and employment across different occupational categories. For Bosnia and Herzegovina, the scenarios explore policies aimed at achieving a just transition in the context of phasing out coal mines and coal-fired power plants, alongside a compensating expansion of renewable energy production. The analysis assesses impacts on employment by occupation and sector, changes in real incomes across economic actors, and highlights the need to include and integrate social protection and sectoral policies. The analysis for Senegal includes the "microsimulation module" of the SMSD, which is based on micro-level data and integrates more detailed household-level analysis into the overall assessment. The scenarios are based on interventions in key sectors identified in Senegal's National Development Plan 2025–29. Income effects are mapped across various household types, while employment effects are broken down by industrial sectors, temporary and permanent employment (the latter based on expanding productive capacity) as well as by formal and informal employment status.

The results from the three applications show distinct policy insights. In Namibia, mining export expansion increases overall income but disproportionately benefits urban households and corporations; but targeted policies, like increased corporate taxation and expanded social investments, can significantly improve rural household incomes and reduce inequality. For Bosnia and Herzegovina, energy transition modelling reveals that closing coal mines without compensatory measures leads to substantial job losses and economic contraction; even with renewable energy expansion, a skills mismatch emerges requiring comprehensive reskilling programmes and complementary industrial policies to achieve a just transition. In Senegal, investment in agriculture and transport infrastructure creates both temporary and permanent jobs (145,453 and 51,067, respectively), with improved formality rates compared to national averages; and particularly positive income effects for vulnerable households, especially those with persons with disabilities, suggesting reduced overall income inequality.

Chapter 5. Economic and social impacts of transport corridor investments: A GIS data analysis for Kenya and Zambia

Authors: Alina Game, David Kucera and Xi Kang

Chapter 5 undertakes analysis of geographic information systems (GIS) data to assess the impacts of road improvement investments in transport corridors in Kenya and Zambia, investments that were financed by the EU, the African Development Bank (AfDB) and the respective governments. Both are strategic cross-national transport corridors of hundreds of kilometres in length, linking interior regions with ports in Mombasa, Kenya, and Nacala, Mozambique. As with previous chapters,

this chapter addresses both economic outcomes (regarding incomes and employment) and social protection outcomes (regarding access to schools and healthcare facilities through reductions in travel time). The chapter briefly discusses the pro and cons of different impact assessment methods and notes that one of the benefits of GIS data is that it is available at high frequency and spatial resolution for basically all areas of the world and is thus particularly useful for assessments in countries with infrequent alternative data sources, such as labour force and establishment surveys.

Economic impacts are assessed using nighttime lights (NTL) data in difference-in-difference econometric analysis, with estimated impacts on NTL converted to local GDP and employment via elasticities. This analysis traces the impacts of road improvement investments for several years after as well as within varying distances from the completed project, which is useful in assessing how timely and effective these investments are in improving the livelihoods of intended beneficiaries. Access to schools and healthcare facilities is assessed using overlaying geospatial data with data on parameters that affect travel speed. Results are expressed in terms of the percentage of the population that can travel to schools and healthcare facilities between 0 and 15 minutes, and between 15 and 30 minutes, before and after the investments in road improvements, with detailed breakdowns by administrative regions.

For the first strand of GIS analysis, key findings are that the road improvement investments in Kenya and Zambia had sizeable positive effects on economic activity in areas adjacent to these investments as proxied by NTL data. These effects tend to increase considerably over time. The chapter also estimates substantial positive impacts of these road improvement investments on local GDP and employment. For the second strand of analysis, key findings are that, for the regions considered, road improvement investments in Kenya and Zambia resulted, on average, in fairly small shares of the population benefiting from reduced travel time to healthcare facilities and schools. Yet, impacts were more substantial for most affected regions, with the shared of population benefiting from reduced travel time increasing by up to several percentage points in both countries. Though the analyses of both economic and social impacts are ex post, their results can also be used to provide ex-ante guidance on the optimal location of prospective road investments.

Chapter 6. The impact of trade union rights on trade: An industry-level approach

Authors: Leanne Roncolato, David Kucera, Mark Anner and Dora Sari

Like Chapters 4 and 5, Chapter 6 is an impact assessment. But rather than looking at policy impacts on employment- and social protection-related outcomes, Chapter 6 looks at the impact of TUR on trade. The debate on trade and international labour standards is venerable, motivating the creation of the ILO in 1919. Concerns over a "race to the bottom" in labour standards feature in the Preamble to the ILO Constitution, which states that "the failure of any nation to adopt humane conditions of labour is an obstacle in the way of other nations which desire to improve the conditions in their own countries". Based on the assumption that compliance with international labour standards can result in higher labour costs, a particular concern in this debate is that the impact of compliance might fall more heavily on developing countries, given their greater reliance on labour-intensive, price-sensitive industries, most notably the wearing apparel industry. The empirical literature on the effects of TUR on trade provided conflicting evidence and essentially died out in the mid-2000s. This was more likely the result of a lack of credible indicators of TUR than a lack of relevance, especially considering the growing number of preferential trade agreements containing labour provisions.

Chapter 6 investigates the impact of TUR on goods exports in a bilateral gravity trade model for the years 2000–17 for a large sample of countries. The chapter uses new indicators of TUR distinguishing between overall TUR and TUR in law and in practice. This is the first study to empirically investigate this question with a large sample of countries since the mid-2000s, and the first to use these indicators in such analysis. It is also the first study to investigate the impacts of TUR on trade using panel data analysis, and the first to break down exports at such a disaggregated industry level. In baseline regressions driven by change over time within countries, the chapter does not find robust evidence that stronger TUR are associated with lower aggregate goods exports. These results are particularly clear-cut for the sample of low- and

middle-income countries as exporters, though somewhat less so for the full sample of countries as exporters. For the latter, the chapter finds that the relationship between TUR and aggregate goods exports no longer holds when dropping just one country as an exporter from the sample. It is the chapter's argument that the observed changes in TUR for this country are not plausibly linked to export performance. In baseline regressions at the industry level for the sample of low- and middle-income countries as exporters, a key finding of the chapter is that the six industries with statistically significant results show that stronger TUR are associated with higher exports. Regarding the labour intensity of production, the chapter finds (for both samples of countries) no clear patterns across industries and in particular no evidence that stronger TUR are associated with lower exports of wearing apparel.

Chapter 7. Building skills ecosystems for sustainable productivity improvements

Authors: Emily Erickson, John Buchanan, Eva Katharina Sarter, Chris Warhurst and Bolormaa Tumurchudur Klok

Chapter 7 provides a critical overview of skills policies and their relationship with productivity increases and economic growth more widely, from macro, meso and micro perspectives. The chapter argues for the need to move beyond the emphasis of human capital theory on a linear relationship from the demand for skills to the supply of skills, with the former focusing on job openings to define skills content and the latter focusing on formal education. Instead, the chapter argues for a more nuanced, circular approach to the relationship between the supply of and demand for skills that: addresses the informal, non-formal and on-the-job character of much skills development, especially in developing countries; the fact that skills are both individual and collective; and the challenges of different types of skills mismatch, particularly the under-utilization of skills. A central idea of the chapter is that skills supply should distinguish between development and sourcing, and that skills demand should distinguish between hiring and deployment. The chapter argues that skills policies are most effective when conceived as a circular flow among these four elements, from development to sourcing to hiring to deployment, then back to development in a continuous cycle. The chapter goes on to situate this skills cycle within industry- or regional-level skills ecosystems, in which the four elements of the skills cycle are mediated by relevant actors and institutions – such as firms, training and education providers, government agencies, and workers' and employers' organizations – and the relationships among them.

The chapter illustrates these concepts through a review of the literature on skills policies and the presentation of country cases. These cases include the upgrading of informal apprenticeships in car garages in Jordan as well as cases illustrated through the significant potential of ILO programmes – particularly the Sustaining Competitive and Responsible Enterprises (SCORE) and the Skills for Trade and Economic Diversification (STED) programmes[3] – in building skills ecosystems in developing countries to achieve sustainable productivity improvement.

The chapter closes with five main conclusions and associated implications for skills policies. These address: the need to move beyond human capital theory and to focus more on collective capabilities; the importance of conceptualizing the relationship between the supply of and demand for skills in a more multifaceted and dynamic manner; at the national (macro) level, the need to treat skills systems as hybrids rather than as universal models; at the industry and regional (meso) levels, the particular relevance of skills ecosystems for improving the effectiveness of skills policies; and at the firm (micro) level, the benefits of "expansive" workplaces with respect to defining and designing jobs, in which good human resource practices are integral to business operations.

3 See the ILO's Sustaining Competitive and Responsible Enterprises (SCORE) Programme and Skills for Trade and Economic Diversification (STED) initiative.

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Chapter

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1

Employment impact assessment: An ILO perspective

Rossana Galli, David Kucera and Meili Fortunee Tuyisenge

1.1. Introduction

A useful rationale for EmpIAs is provided by the ILO's *Reference Guide on Employment Impact Assessment* (ILO 2025), which also argues why the ILO has a strategic institutional role to play:

> "The rationale for an employment impact assessment is to anticipate and/or measure the potential or actual impact of policies or interventions on jobs and job-related outcomes as an ongoing process to constantly improve the design and implementation of policy and programme options. Employment policy is an area wherein there are relatively large gaps in evidence. An employment impact assessment can contribute towards improving the effectiveness of policy responses. Linked to this is the complexity of the policymaking process, especially when related to employment and labour market outcomes, where stakeholders may have diverging interests. This is where the ILO has a particularly important role in building up the institutional capacity of national employment authorities and other institutions to conduct these types of assessments and to advise on institutional coordination mechanisms" (ILO 2025, 2).

The guide has sections presenting the wide range of EmpIA methods used by the ILO, describing their objectives, how they work, the typical questions they can address, the centrality of the quality as well as quantity of employment, and their varied pros and cons. It builds on roughly 100 EmpIA studies undertaken by the ILO that illustrate these different methods. Sections 1.2 and 1.3 provide a review of these EmpIA studies, based on the coding of their substance first, and then on the coding of the extent to which they document social dialogue – that is, engagement with governments and the ILO social partners. In this sense, this chapter is intended as a companion and complement to the guide. Section 1.4 summarizes interviews with ILO colleagues at headquarters and in regional offices, based on their experiences with undertaking EmpIAs and endeavouring to institutionalize them at the national level, with an emphasis on the role of social dialogue in doing so. Each of these three sections closes with a snapshot of key findings.

Section 1.5 describes key aspects of the work of the Employment Policy Department's STRENGTHEN2 project, a joint initiative of the EU and the ILO that has played a central and strategic role in the ILO's work on EmpIA. Though the work of the project is wide-ranging, this section focuses on its engagement with FIs through a series of workshops, which have promoted mutual learning and resulted in an increased appreciation among the FIs of the ILO's expertise in EmpIAs, as exemplified by the innovative methods applied in Chapters 3 and 4. The section also describes a series of training events on EmpIA undertaken by the ITCILO, the training arm of the ILO, as well as the STRENGTHEN2 project. These training events are aimed to meet ILO constituents' growing demand for impact assessments and to build capacity to support their institutionalization at the national level, including "soft" institutionalization that enables constituents to more effectively plan and manage impact assessments.

1.2. Coding of employment impact assessment studies

This section and section 1.3 present the results of the coding of 98 EmpIA studies, which were evaluated according to five categories: type of policy intervention assessed, main impact variable considered, estimation method, breakdown of main impact, and type of social dialogue involved in the assessment. The coding categories used for this work are summarized in table 1.1.[4]

Figure 1.1 shows the classification of 98 EmpIA publications according to the type of policy intervention under study. These studies are listed in the references of ILO (2025) and, as noted, the coding of these studies for this report should be seen as a companion to the guide.[5] These studies represent ex-ante or ex-post estimations of the impact on employment quantity, quality or related variables for six main categories of policy interventions.

- **Infrastructure investment.** Government spending on infrastructure projects such as road rehabilitation or rural electrification.

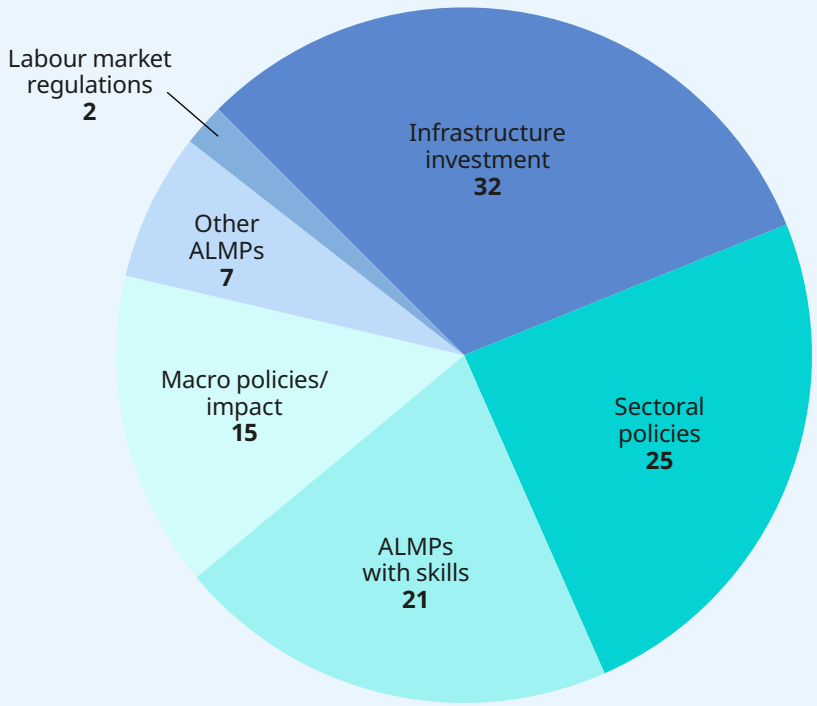
4 A table with the detailed classification of the 98 studies is available upon request.

5 The number of studies surveyed in this report is slightly lower than the number of papers referenced in ILO (2025), because when two different versions of the same study were available; only the more recent one was considered.

▶ **Table 1.1. Summary of coding categories**

Intervention	Main impact assessment	Method	Breakdown of main impact	Social dialogue
Infrastructure investment	Employment	Input–output	Gender	Co-authored with
Sectoral policies	Employability/ skills development	SAM	Age	Requested by
ALMPs with skills	Empowerment	Local multipliers	Sector	Consulted with
Other ALMPs	Enterprise performance	General equilibrium model	Direct/indirect/ induced	Data provided by
Macro policies/ impact	Productivity	Growth decomposition	Skills and education	Presented to
Labour market regulations		Geographic information system	Occupation	Intended for/ targeted to
		Randomized control trials	Nationality/region/ migrant status	Not available
		Quasi-experiments	Rural/urban	
		Other econometric and statistical methods	Employment status	
		Interviews and surveys	Formal/informal, social protection	
		Literature surveys	Duration of contract	
			Wage rate	
			Household income	
			Union status	
			Firm size	

▶ **Figure 1.1. Classification of 98 employment impact assessment studies by type of policy intervention**



Note: Total sums to 102 since four studies were classified twice.

- **Sectoral policies.** Policy interventions aimed at creating new jobs or improving the quality of jobs in specific sectors, such as policies for promoting green jobs in renewable energy, forestry or recycling sectors.

- **ALMPs with a skills development component.** Policy interventions aiming at increasing employment opportunities or working conditions by improving workers' skills and competencies. This category is defined to include any component of skills development, such as life skills and civic education training (Elsayed and Roushdy 2017), or paid and unpaid internships and volunteer work not associated with ALMPs (O'Higgins and Pinedo Caro 2021).

- **Other ALMPs.** ALMPs that do not include any skills development component, thus excluding the previous category. Examples of such policy interventions are entrepreneurship promotion (Barsoum et al. 2015) or financial services (Fiala 2015).

- **Macro policies and impacts of COVID-19 or other natural disaster impacts.** This category includes EmpIAs of macroeconomic policies such as trade impacts (Kucera and Jiang 2018) or fiscal consolidations (Isaza-Castro, unpublished). It also includes EmpIAs of COVID-19 (Ernst and López Mourelo 2020).

- **Labour market regulations.** Policy interventions affecting minimum wages and employment protection legislation (O'Higgins and Pica 2017).

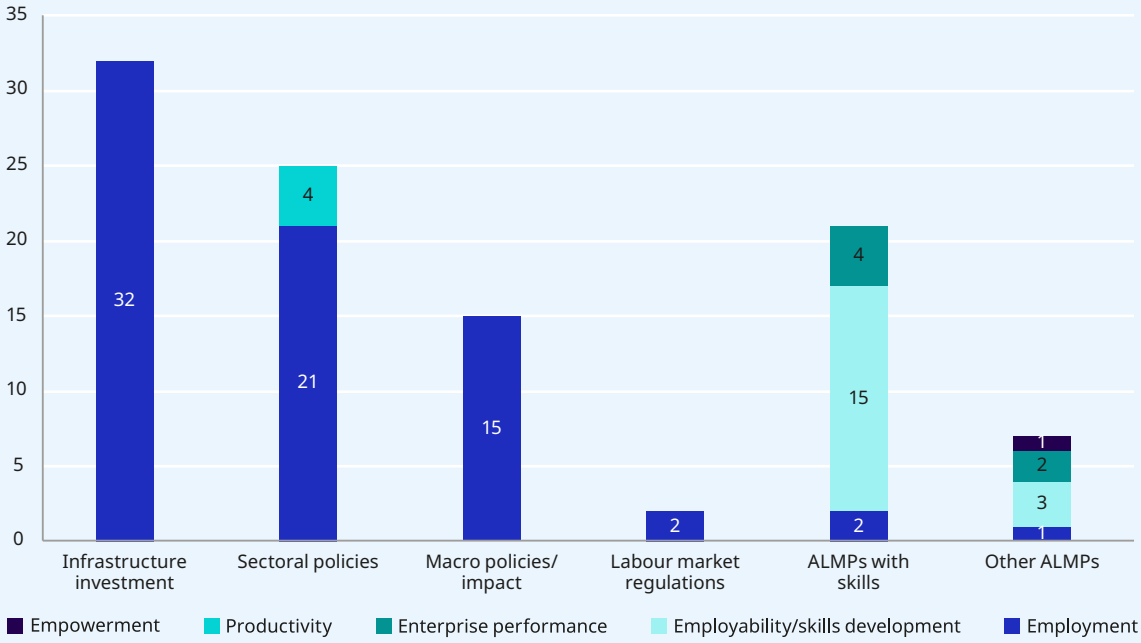
As shown in figure 1.1, the most common type of policy intervention analysed through EmpIAs in the surveyed literature are government spending on infrastructure investments (32 studies). Sectoral policies represent about one quarter of the surveyed EmpIAs. The efficacy of ALMPs is also often the object of empirical analysis, with 21 studies concerned with the impact of skills development and 7 with other non-skills policy tools to enhance workers' employability and enterprise performance. Macro policies are less commonly analysed through EmpIAs (15 studies, including 7 empirical estimates of the labour market impact of COVID-19). Last, only two of the surveyed studies address the impact of labour market regulations.

Figure 1.2 shows, for the 98 surveyed papers, which variable is the main object of the empirical impact assessment, grouped by category of policy intervention analysed. All studies concerned with infrastructure investment, sectoral policies (except for three studies that look at productivity), macro policy and COVID-19, and labour market regulations focus on employment as the main policy impact variable assessed. Note that focusing on employment does not mean only to focus on the number of jobs created; most studies also address the quality of jobs created, as shown in figure 1.3. Not surprisingly, the 28 surveyed studies concerned with the impact of ALMPs (both skills development and other policy tools) rather use indicators of employability, skills enhancement or empowerment if the units of study are individuals, whereas they focus on enterprise performance variables if the researched beneficiaries are enterprises.

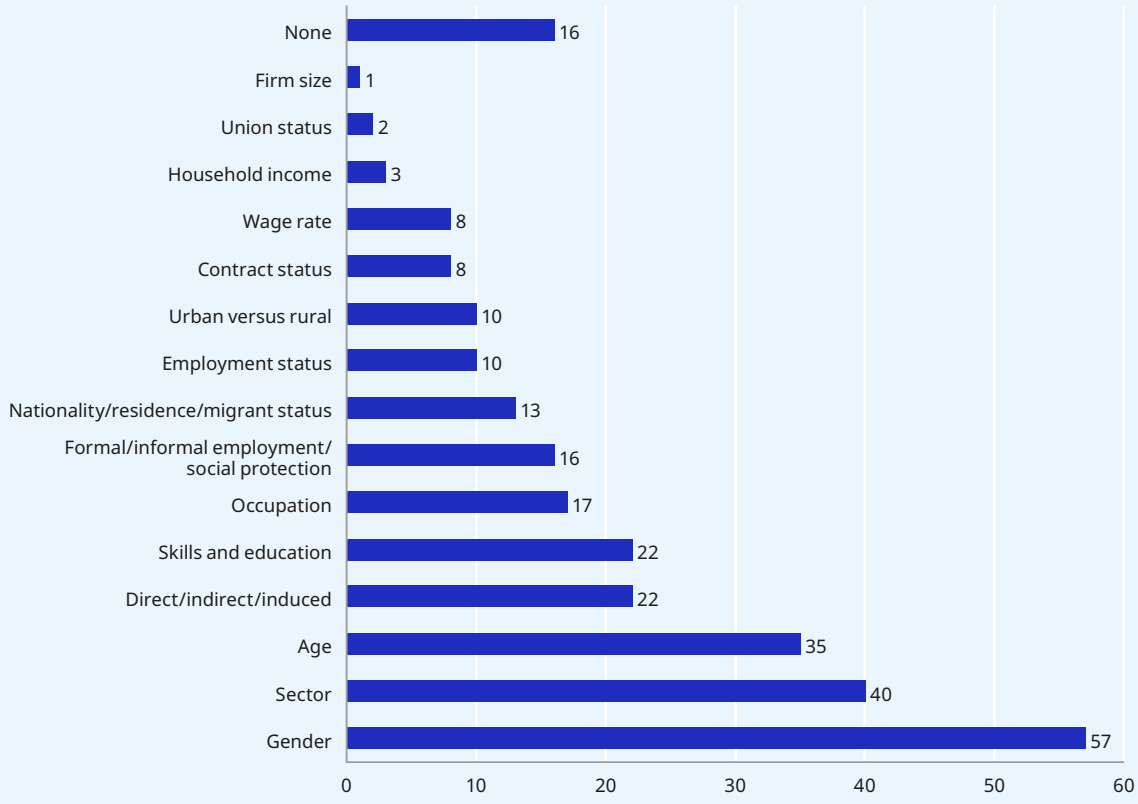
Figure 1.3 shows, for the 98 surveyed empirical studies, the frequency with which the policy impact on the main dependent variable (employment, employability, empowerment, enterprise performance, and productivity) is presented at a disaggregated level. More than half of the studies address the gender differences of the policy impact under analysis, while about one third address the impact on individuals of different age brackets. Although most of the surveyed studies explicitly address quality in addition to the quantity of jobs, a relatively small number of them present the impact of policy interventions on employment variables at disaggregated levels that go beyond gender and age. In fact, besides the focus on specific sectors (in 40 studies) or on the direct, indirect and induced employment impact of specific policy interventions (in 22 studies) – disaggregations that depend on the very nature of the research and methodology adopted – only 22 studies show their empirical results disaggregated by skills and education, 17 by occupation,[6] 16 by formal/informal employment and social protection, 13 by nationality, ethnicity, race, residence (region, district or town) or migrant status, 10 by employment status (self-employed, employees, employers and contributing family workers), 10 by rural/urban residence, 8 by duration

6 When a study uses occupations to define skills but does not have an explicit occupation breakdown, it is only classified under skills and education.

▶ Figure 1.2. Main impact assessed by type of policy intervention



▶ Figure 1.3. Main impact variables



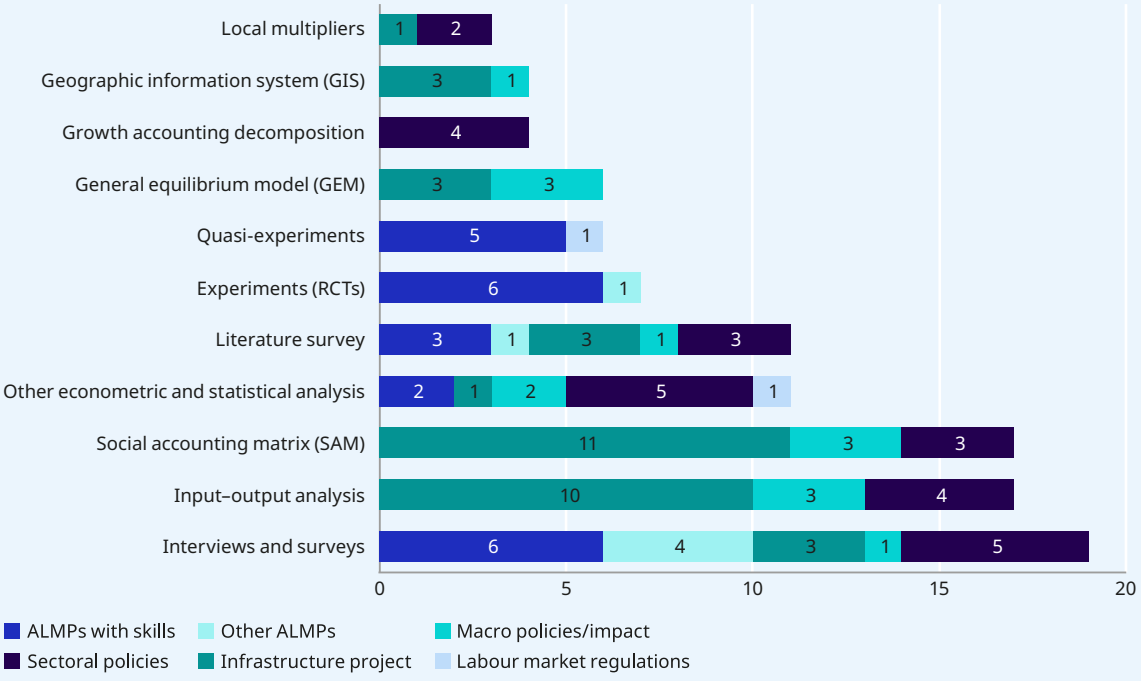
of contract (temporary/permanent), 8 by wage rate, 3 by household income, 2 by union status and 1 by firm size. Finally, 16 studies do not show any disaggregation of the main impact variable (most of these being literature surveys).[7]

Figure 1.4 shows the classification of 98 EmpIA publications according to the type of policy intervention under study and the method used to estimate its impact on labour market outcomes. The methods used by the authors of the 98 evaluated studies to estimate the impact of the policy intervention on labour market outcomes vary widely and were classified as follows:

1. Input–output table (I–O)
2. SAM
3. Local multiplier
4. General equilibrium model (GEM)
5. Growth decomposition
6. Geographic information system and remote sensing (GIS)
7. Experiment – randomized controlled trial (RCT)
8. Quasi-experiment
9. Other econometric and statistical analysis
10. Interviews and surveys
11. Literature survey

Methodological approaches 1 to 8 are described in the *Reference Guide on Employment Impact Assessment* (ILO 2025).[8] Category 9 – Other econometric and statistical analysis – is a residual category defined to include econometric and statistical methods other than those described in categories 1 to 8 – for instance, regressions based on unemployment and other labour market variables panel data (Ebell and O'Higgins 2015), meta-analysis (O'Higgins and

▶ Figure 1.4. Type of policy intervention by method



7 In figure 1.3, the total number of observations exceeds the number of surveyed documents as studies presenting the policy impact on the main dependent variable disaggregated by more than one category are counted multiple times.

8 Differently from ILO (2025), this report includes the "structural model for sustainable development" approach into the umbrella category of general equilibrium models, since only one paper used that methodology.

Moscariello 2017), cluster analysis (Ernst and Robert 2019), and analysis of maps (Escartín 2021).

All studies making descriptive use of questionnaire surveys fall within category 10, such as establishment surveys (Jiménez, unpublished), structured and in-depth interviews (ILO 2017a), and any other surveys providing quantitative or qualitative information. Note that I–O, SAM and GEM studies that use interviews or surveys to estimate direct employment effects are classified only as I–O, SAM or GEM (not as interviews and surveys). Finally, literature surveys and comparative analysis of different employment impact estimation tools (Rojo et al. 2020), are included in category 11.

Figure 1.4 reveals several interesting facts regarding the methodological approach used by the 98 EmpIAs under review.[9] First, it can be observed that interviews and surveys conducted with key informants and institutions are the most commonly used approach to estimating government policies and programmes impact on employment (19 studies use this approach). This method is prevalently used to evaluate the employment impact of ALMPs (ten studies), but it is also adopted by authors interested in sectoral policies (five studies), infrastructure investment projects (three studies) and macro policies (one study). The prevalence of this approach is likely due to its simplicity and to the fact it relies on ad hoc data that are collected by the authors themselves.

I–O tables and SAMs are the second most used methods in the 98 studies under review (17 studies use I–O and another 17 use SAM). As shown in the figure, I–O table and SAM analysis are applied mostly to assess the direct, indirect and induced employment impact of infrastructure public investment projects. However, authors of macro policy and sectoral policy impact studies also often make use of these tools.

RCTs and quasi-experiments are mainly used to estimate the impact of ALMPs, such as training and vocational programmes. In the surveyed literature, these two approaches appear in 13 studies (7 and 6 for RCTs and quasi-experiments, respectively). The preference for these approaches in the case of ALMPs evaluations is unsurprising, since RCTs and quasi-experiments are explicitly designed to assess the effectiveness and causality of such programmes, by comparing the characteristics and labour market outcomes for participants with non-participants.

Finally, GEM, growth accounting decomposition, GIS and local multiplier approaches are adopted by a smaller number of authors for assessing infrastructure investments and sectoral and macro policies. Moreover, 11 of the reviewed studies adopt an econometric or statistical approach different from those described above, and another 11 studies provide literature surveys or comparative studies of different methodologies for EmpIAs.

Key findings

- The two most common types of interventions analysed by the 98 reviewed EmpIAs are infrastructure investments and ALMPs.
- Most EmpIAs focus on impacts on employment and fewer on employability.
- Only a small number of EmpIAs present disaggregated impacts on employment-related outcomes beyond gender and age.
- The most used EmpIA method is interviews and surveys of key informants and institutions, mainly to estimate the employment impacts of ALMPs.
- I–O tables and SAMs are the second most used method, mainly to estimate the direct, indirect and induced employment impacts of infrastructure investments.
- RCTs and quasi-experiments are the third most used method, mainly to estimate the employment impact of ALMPs.

1.3. Employment impact assessments and social dialogue

An EmpIA is by definition an evaluation of the effect of a specific intervention on the quantity and quality of employment in a given country, region or sector. It is therefore expected that the goal of any EmpIA involving the ILO is to support governments in

9 In figure 1.4, the total number of observations (106) exceeds the number of surveyed documents (98) as some studies are assigned to two categories, either because they use two different estimation methods or because they analyse two different types of policy interventions.

formulating policies in such a way to maximize its positive impact on workers. This goal, however, could be the result of different degrees of collaboration between the authors and governments, and it may or may not involve social dialogue, that is consultations and collaborations with governments and the ILO social partners (employers, workers and their respective organizations).

Based on the information presented in prefaces, acknowledgements and introductions, the 98 surveyed publications were classified by the nature and depth of governments' and social partners' involvement in the research. At one end of the spectrum, EmpIAs can be requested by governments themselves, before or after the implementation of the evaluated policy programme. In some cases, the collaboration between the authors (often the ILO) and the government can take the shape of a co-authorship, a consultation process or the provision of data that may not be readily available from public sources. Sometimes, the results of the research are presented to the intended beneficiaries (ministries and social partners) and their feedback may be incorporated in the study. Moving along the spectrum of collaboration and social dialogue, EmpIAs may be intended for creating knowledge, building capacity or providing policy recommendations to the government and social partners of a specific country, without the study being explicitly requested by governments[10] nor actively involving governments and social partners in a consultation process. Finally, EmpIAs may not be aimed at supporting policy formulations in specific countries but are rather meant to contribute to building up and diffusing knowledge on employment policy impacts more generally.

Figure 1.5 shows the distribution of the 98 EmpIA surveyed studies according to the character of collaboration and social dialogue occurring before, during and after the research between the authors (often the ILO) and governments and social partners, insofar as these are documented in the EmpIA studies.[11]

As shown in figure 1.5, only a minority of the analysed EmpIA literature documents the closest form of collaboration with ministries and governmental offices (6 requests and 5 co-authorships out of 98 studies). Yet, around one third of the evaluated studies document governments or social partners in a consultation process (36 studies), which can also take the form of ad hoc data provision (9 studies) or the presentation of the assessment results to the government and social partners in a dedicated workshop or conference (6 studies). Almost half of the surveyed papers do not document a direct involvement of government or social partners in the research process (42 studies), although these studies are explicitly aimed at creating knowledge, building capacity or providing policy recommendations to the government and social partners of a specific country. Finally, 12 studies are classified as "not applicable", as there is no documented reference to social partners and government involvement nor to a specific country, although these studies may nonetheless make a significant contribution to advancing work on EmpIAs.

Figure 1.6 provides a breakdown for the 36 papers which were found to have involved public and private stakeholders in a consultation process, by specifying which constituents were consulted. Based on the information provided by the studies, in most cases (29 out of 36 studies) only government officials are included in the research process and actively contributed by providing information and feedback to the researchers. The social partners, on the other hand, are less often part of the research process: only in seven cases were they actively involved.[12]

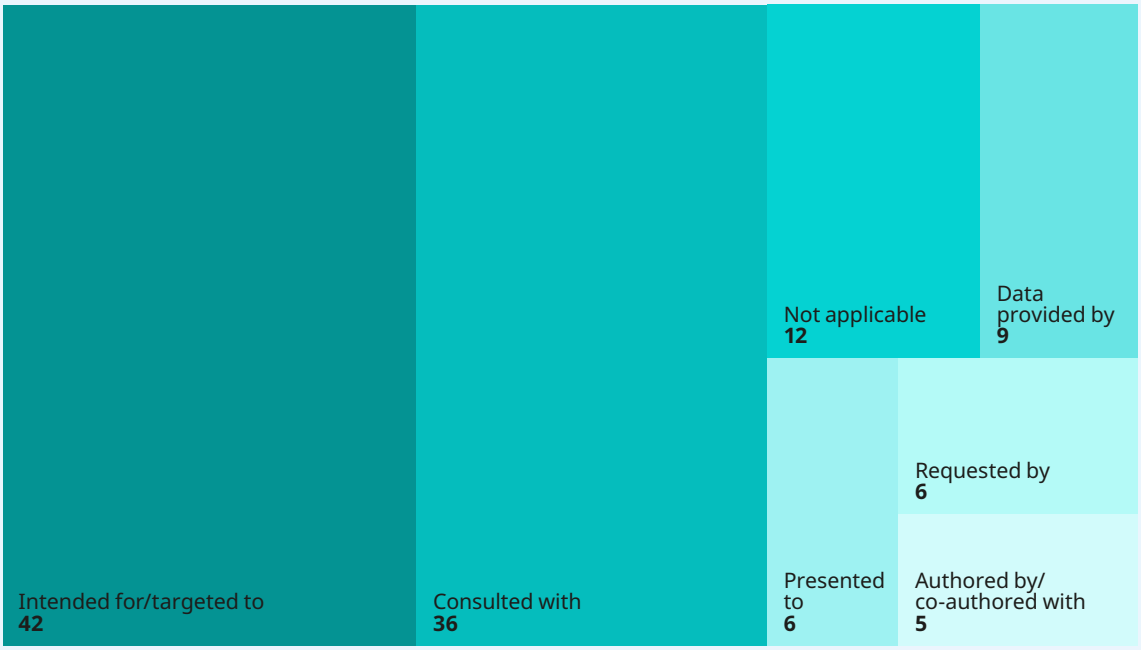
Overall, the above analysis suggests that EmpIAs often involve some kind of collaboration with government officials but much more rarely include

10 Sometimes, the employment impact assessment may be required by the institutional donor funding a specific project, as in the case of the European Investment Bank infrastructure investments in the Mediterranean Partner Countries, for example (EIB and ILO 2015).

11 The total number of observations in figure 1.5 is higher than the number of analysed papers because, when a publication documented different types of collaboration with the government or social partners, multiple entries were allowed for any given paper. The only exception is that "Intended for/targeted to" is mutually exclusive with respect to "Consulted with", "Requested by", and "Authored by/co-authored with", to highlight that the last three categories represent closer forms of collaboration with constituents than the first. Also, for studies that are part of the same publication series for the same project, the information provided in the prefaces of some papers was used to support the classification of other papers in the same series.

12 The following studies explicitly mention an active involvement of social partners at some stage of the research: Ernst and Robert (2019); Ernst et al. (2020); ILO (2017b); ILO and ADB (2014); Lachaud et al. (2018); Lieuw-Kie-Song and Abebe (2019); and Shaffer (2018).

▶ **Figure 1.5. Employment impact assessments and social dialogue**



▶ **Figure 1.6. Employment impact assessments and social dialogue in the 36 concerned studies: Consulted with whom?**

the social partners as active contributors, or at least their contribution is not well documented in these studies. Hence, as a general recommendation, it would be advisable to involve governments and social partners more often in EmpIAs or at least to more systematically document the different forms of social dialogue in the ILO's work on EmpIAs.

Key findings

- Few of the 98 reviewed EmpIAs document the closest form of collaboration with ministries and governmental offices, based on direct requests or co-authorship.
- About one third of EmpIAs document the involvement of governments or social partners in a consultation process.
- Of the roughly one third of the EmpIAs that document the involvement of governments or the social partners in a consultation process, in most cases only government officials and not the social partners were actively involved.
- Nearly half of the EmpIAs document that they are aimed at creating knowledge, building capacity or providing policy recommendations to governments and social partners of specific countries, even though they do not document a closer collaboration with governments or the social partners.

1.4. Interviews with ILO officials on employment impact assessments

To better inform this review, a series of semi-structured interviews were conducted with 16 ILO officials asking about their work on EmpIAs – 9 from the ILO headquarters in Geneva, 6 from ILO field offices (2 in Asia, 2 in Africa and 2 in Latin America) and 1 from the International Training Centre of the ILO in Turin, Italy.

Among the questions posed, several regarded social dialogue in relation to EmpIAs. We asked the interviewees about the benefits of stronger social dialogue for EmpIA, but also the benefits of EmpIAs for stronger social dialogue; challenges for social dialogue in the context of EmpIAs; the nature of engagement with ILO constituents in their current or past work on EmpIAs; and examples of successful engagement with governments and social partners on EmpIAs.

As regards the impact of stronger social dialogue on EmpIAs, most interviewees highlighted that involving social partners in EmpIAs can enrich assessments by incorporating their diverse viewpoints and practical knowledge of what works in specific contexts. Moreover, unions – when involved in the process – can bring EmpIA researchers to pay more attention to the quality of employment rather than just the quantity.

An interesting example of how involving employers' and workers' organizations in EmpIAs can help researchers identify key issues and correctly interpret the results is provided by the case of Ghana. In Ghana, an EmpIA focused on the cocoa sector created an opportunity for the Ministry of Employment and Labour Relations, employers and workers to come together and discuss how cocoa exports impact employment. The conversation unexpectedly shifted to issues surrounding cocoa bean size, which had become a key factor in local processing and employment creation. Specifically, local processors preferred smaller beans for their domestic market, but international standards favoured larger beans for export. This differentiation posed a challenge to local job creation, as local processors had access to smaller beans but struggled to compete for the standardized beans required for export. The dialogue brought to light how the size of cocoa beans, rather than issues like domestic processing capacity or transport costs, was the main factor limiting employment growth. This illustrates how social dialogue helps identify real problems that might be overlooked during initial assessments, providing a platform for addressing unanticipated issues through collaborative discussion.

Several interviewees explained that expanding the dialogue to a wider range of actors, although making the process more challenging and time-consuming, can also make it more effective. Social dialogue in EmpIAs is likely to lead to outcomes and policy recommendations that are more relevant and hence more likely to be supported and implemented, thanks to the shared ownership of the results. On the other hand, it was noted that when multiple stakeholders participate, reaching consensus often leads to broad and generalized recommendations, reducing their effectiveness and actionability. Clear, detailed policy recommendations are harder to achieve in this context, as specifics may lead to disagreements. Finally, two respondents also stated that involving national statistical authorities in EmpIAs opens doors to obtain up-to-date,

unpublished statistical information and access to contacts and information sources, making EmpIAs more feasible, relevant and accurate.

If most interviewees agree on the fact that involving social partners in EmpIA processes is important and beneficial, some interviewees were more specific about *when* it is best to involve social partners in the assessment process. In fact, presenting the outcomes of EmpIAs to ministries and employers' and workers' organizations is clearly important, but what matters most is involving them from the beginning of the policy evaluation project, starting from the decision of which policies to assess. Only if all stakeholders are consulted in the planning stages will consensus be established and policy buy-in from social partners and government entities be increased. An interviewee additionally suggested the importance of recurrent, ongoing dialogue – besides early-stage consultations and sharing of final results –, generating an iterative process where ideas are exchanged and results are interpreted collaboratively.

When asked about the benefits of stronger social dialogue for EmpIAs, most interviewees also highlighted the opposite relationship; that is, the benefits that EmpIAs can have on social dialogue. It was explained that EmpIAs can also be seen as providing a means for stimulating and strengthening dialogue among different ministries and social partners. These assessments, in fact, prompt governments to bring data to tripartite meetings. By grounding discussions in quantitative evidence, EmpIAs enhance the scope and quality of conversations among stakeholders about the potential employment impact of various policies, thus strengthening social dialogue.

In the survey, the sample of ILO officials was also asked about the nature of engagement with ILO constituents in their current or past work in EmpIAs. In contrast with their general awareness of the benefits of stronger social dialogue for EmpIAs (and vice versa) and of the importance of involving social partners from the beginning to the end of the policy evaluation process, their answers revealed that consultations with social partners often occur only during the later stages of assessments, when presenting results and developing road maps for implementation. Moreover, while there is often a strong focus on consultations with labour ministries, there is a recognized need for broader discussions involving the ILO social partners to ensure that the findings of EmpIAs have the support of all stakeholders. It must be noted, however, that the nature of engagement with constituents for EmpIAs varies significantly at the country level, especially between ILO headquarters and field offices. In field offices, social dialogue is typically routine, with field staff regularly consulting with ILO constituents before proceeding with policy assessments.

In this context, respondents were asked to provide some examples of more successful engagements with governments and social partners on EmpIA. Among these examples, the Labour Market Recovery and Transformation Strategy in Sri Lanka exemplifies a structured, cooperative effort of EmpIA, resulting from a tripartite approach with the government, trade unions and employer organizations. This strategy for a job-centred economic recovery was developed at the request of the Government of Sri Lanka and based on both dialogue among the stakeholders and recent research, particularly the results of a rapid assessment of the impact of the multiple crises on MSMEs.

Another successful example of engagement with governments and social partners in EmpIAs mentioned in the interviews is Namibia, where a government-led EmpIA working group was formed. This group includes participants from the Namibia Statistics Agency, the Ministry of Labour and other key agencies. The working group received training on advanced methods, such as economy-wide models, and has become a focal point for future EmpIAs. This working group is set to conduct assessments using these methods, with the objective of transferring the acquired knowledge to other government agencies, creating a sustainable team capable of continuing EmpIAs on their own.

The above observation that EmpIAs have primarily involved working with government ministries – such as labour, public works and finance ministries – with less engagement from social partners like trade unions or employers' organizations, can be explained by the complex technical nature of EmpIAs. When asked about the challenges to social dialogue in policy assessments, many interviewees pointed at the complexity of EmpIAs as one of the key obstacles to broader engagement. If methodologies are too technical or opaque ("black box" approaches), it can be difficult for stakeholders to fully understand or engage with the assessment process. Balancing capacity among the participants is therefore a key challenge to social dialogue in the context of EmpIAs.

This is the reason for the efforts put in place by the ILO to build social partners' capacity in the context of EmpIAs, for example, through the training courses organized by the ITCILO. As observed by one interviewee, since social partners may lack the background or *time* to fully engage in technical processes such as EmpIAs, it is more practical in many cases to build their capacity so that they have sufficient knowledge to plan and manage EmpIAs through consultants, rather than expecting them to conduct the assessments themselves. Besides building the capacity of social partners, efforts to enhance social dialogue in EmpIAs necessitates the use of accessible language and methods to ensure mutual understanding.

The survey also inquired about the actual implementation of EmpIAs, asking for examples of where ILO EmpIAs were used by governments or social partners. Respondents agree that measuring the concrete usage of EmpIA results by social partners or governments has been challenging. After EmpIA projects end, evidence of follow-up on the outcomes and actual implementation of the policy recommendations is limited. Staff turnover, limited resources, shifting project priorities, politics and elections can hinder the long-term impact and sustainability of EmpIA, even when it fully engages all stakeholders. However, this is not to say that EmpIA studies never have direct, concrete impacts. For instance, a respondent reported that, in Rwanda, some insights from the EmpIA component of the STRENGTHEN2 project (though still in progress and not fully published yet) are already being used by the government to improve their approach. In any case, while direct application of EmpIAs is not always evident, assessments have been recognized as valuable for fostering awareness.

An additional observation that emerged from the survey is that engagement with governments and social partners in EmpIAs often occurs on an ad hoc basis, rather than through structured, consistent processes. The requests for EmpIAs often come from government entities spurred by emergency situations or economic downturns, creating an urgent need for data and analysis. In other cases, they are driven by external entities, such as universities and think tanks, and may be aimed at understanding labour market changes, such as the impact of a new regulation on youth unemployment and informality. Rather than using EmpIAs to conduct ad hoc assessments of the impact of crises, recessions or specific labour market changes, there is a need to institutionalize the capacity within governments to perform these assessments regularly. As noted above, this could also take the form of "soft" institutionalization, enabling government officials to more effectively plan and manage EmpIAs undertaken by consultants. In any case, this would facilitate the sustainability of the EmpIA process at the country level.

Key findings

- Benefits of social dialogue for EmpIAs:
  - Can make EmpIAs more accurate by incorporating diverse viewpoints, practical knowledge and unpublished up-to-date data.
  - Can make EmpIAs more effective as outcomes are more likely to be supported and policy recommendations are more likely to be implemented.
- Challenges of social dialogue for EmpIAs:
  - Makes the process more time-consuming.
  - Reaching consensus can lead to overly general recommendations, reducing their effectiveness and actionability.
- Benefits of EmpIAs for social dialogue:
EmpIAs can stimulate dialogue among different ministries and social partners by more firmly grounding discussions on evidence.
- Challenges of EmpIAs for social dialogue:
  - The complex technical nature of EmpIAs requires capacity-building.
  - Social dialogue on EmpIAs occurs less extensively than would be ideal and most often in later stages of the process.
  - EmpIAs often occur on an ad hoc basis rather than through structured, consistent processes, so there is a need to institutionalize capacity within governments to perform these assessments regularly.

1.5. ILO's EmpIA-related training and engagement with financial institutions

1.5.1. International Training Centre courses on employment impact assessments

The ITCILO is the training arm of the ILO and is based in Turin, Italy.[13] The ITCILO has offered several courses on EmpIA in recent years and will continue to do so. The courses are targeted towards government officials involved in designing and implementing policies that affect employment as well as operational staff from international organizations and development agencies. Though these courses differ in emphasis, the most comprehensive of them provide training in a wide range of methods, including: employment multiplier analysis using I–O tables and SAMs; analysis using GIS data; methods for identifying potentially promising sectors for the export expansion, economic diversification and the creation of decent jobs; RCTs; quasi-experiments; and meta-analysis. The courses also provide examples of how EmpIAs have been institutionalized at the country level, enhancing their sustainability.

While there are limits to how much working knowledge they can obtain in these courses across the range of EmpIA methods (with face-to-face courses typically lasting one week), participants nonetheless develop a sense of the pros and cons of these different methods for different applications and how to develop a theory of change to facilitate planning and managing EmpIAs, including addressing data requirements and challenges. The knowledge gained in these courses can guide both ex-ante policy design as well as ex-post policy evaluation, for which a key challenge attributes observed outcomes to policy interventions. The ITCILO courses thus provide a means of institutionalizing expertise on EmpIAs at the country level and, thus, contribute to their sustainability.

An example of the hands-on, active nature of these courses is provided by the face-to-face course "Jobs Measurement and Employment Impact Assessment" held in October 2023. The course culminated in participants preparing in-class presentations on actual projects to create decent jobs and improve livelihoods, for which they developed a theory of change and chose methods they felt were most appropriate to assess the interventions. These projects involved: improving roads to facilitate copper transport in Zambia; providing financial assistance to small and medium enterprises in Afghanistan; promoting the transition of enterprises and workers from the informal to the formal economy in Côte d'Ivoire; promoting employment among Palestinian refugees in Lebanon; creating energy through green hydrogen in Namibia; improving employability through an internship programme in Rwanda; and facilitating just transitions away from coal-fired power plants in Viet Nam.

1.5.2. STRENGTHEN2 workshops on employment impact assessments

The STRENGTHEN2 project is a joint initiative of the EU and the ILO, with a focus on assessing EU investments in projects in sub-Saharan Africa.[14] The project began in 2020 and has played a central and strategic role in the ILO's work on EmpIA. One of the most important activities of STRENGTHEN2 is a series of workshops bringing together EmpIA experts from a range of FIs, the EU and the ILO. The five workshops to date have promoted exchanges among participants on a range of topics, such as comparisons of methods and definitions – notably definitions of employment quality – as well as related data challenges. What follows is a summary of each of these events, emphasizing aspects that may be of particular relevance for readers of the GEPR, particularly ILO constituents.

FIs and EmpIAs: The state of play (2 February 2022). The workshop addressed the varied definitions and terminology used by different FIs regarding EmpIA, with the objective of facilitating exchanges on these issues if not of reaching

13 Further information on the ITCILO is available at: https://www.itcilo.org/about.

14 Further information on STRENGTHEN2 ("Employment impact assessment to maximize job creation in sub-Saharan Africa") is available at: www.ilo.org/strengthen2.

agreement on common usage. For example, though direct and indirect employment effects are comprehensive in a literal sense, some EmpIA practitioners will undoubtedly continue to refer to income-induced (or just induced) effects and capacity effects, with indirect effects in this context referring more specifically to employment effects resulting from production linkages.[15] The workshop also featured presentations of the FIs' different EmpIA methods, to convey a sense of whether it is possible to identify and possibly converge on best practices. To inform the agendas of future workshops, this initial workshop undertook a poll in which participants voted on their preferred topics. Of the ten topics proposed, the two receiving the most votes were long-term effects and data and data sharing, followed by job quality and the different objectives of those undertaking EmpIA.

Measuring quality of employment and long-term employment impacts (20–21 October 2022). Employment impact assessments often focus more on the quantity than on the quality of jobs created, and one of the objectives of this workshop – and of the ILO's work on EmpIA more generally – is to incorporate the quality of employment more centrally into EmpIA. This requires clarity on the definitions of employment quality as well as on the associated data challenges. The discussion on measuring employment quality centred on a presentation by the ILO on decent work (DW) indicators, following guidelines from the 18th International Conference of Labour Statisticians in 2007.[16] The ILO has created 70 DW indicators addressing ten dimensions of DW as well as the broader economic and social context for DW, indicative of the multifaceted nature of employment quality. The challenges of assessing long-term employment impacts were addressed through presentations of different EmpIA methods. There were two presentations by ILO officials, on the SMSD and on assessments based on the analysis of GIS data. Both methods centrally address how impacts on employment play out over time and are featured in this report.

Measuring quality of employment and non-direct employment impacts (4–5 December 2023). Building on the prior workshop, a key theme of the workshop was the importance of SDG 8 on "full and productive employment and decent work for all" as a means of aligning different FI's definitions of employment quality. In addition to a discussion on the ILO's DW indicators, the workshop featured presentations by the FIs on the indicators that they use to measure employment quality and how these can be applied in EmpIAs. Under the topic of indirect employment impacts, the workshop addressed short-term versus long-term job creation, as well as the issues of data and data sharing, identified as priorities by participants in the first workshop. One of the most challenging discussions was on why EmpIA results for a given investment vary so much among methods and whether it is possible to improve the comparability of results. These differences arise not just from estimation methods per se but also from differences in the definitions of impacts (for example, new jobs created versus existing jobs supported) and different assumptions about how a project's expenditures are allocated across the economy (which can lead to significant variations in results, even with the same model). While it might be desirable to improve the comparability of results from different EmpIA methods and models, challenges include path dependency (given practitioners investments of time and resources in often proprietary methods) and the challenge of agreeing on the theoretical underpinnings of these models, which are based on different views on how economies and labour markets function.

Measuring non-direct employment impacts: Fallback breakdowns for ex-ante estimations (21 May 2024). The fourth of these workshops was shorter and more focused than the others. It addressed a key challenge from the prior session: assumptions about how a project's expenditures are allocated both across the economy and over time, given that project-specific expenditure data are often not readily available. The workshop featured presentations on how different EmpIA practitioners have developed generic expenditure breakdowns by type of project, based on representative data for past projects. There was strong consensus among workshop participants on the need for future work

15 Income-induced employment effects refer to jobs created through the expenditures of incomes resulting from the creation of direct and indirect (through production linkages) jobs, while capacity effects refer to jobs created through the expansion of productive capacity, such as through new or improved roads or energy production facilities.

16 See 18th International Conference of Labour Statisticians.

on developing generic expenditure breakdowns by type of project, facilitated by collaboration among institutions regarding data sharing and methods.

Measuring the impact of investments on job creation and skills in the context of a green and just transition: Challenges and actions in practice (4 December 2024). This workshop focused on modelling methods and the application of these methods for EmpIA focusing on the green economy and just transition, the latter addressing support for workers in carbon-intensive sectors. It discussed the challenges of defining green jobs and definitions based on sectors as well as by tasks within occupations, drawing on the statistical definition developed by the 19th International Conference of Labour Statisticians in 2013.[17] Key themes of the workshop were the need for further work on assessing the skills required for a green transition and the importance of broadening the scope of green job initiatives beyond the energy sector. Participants expressed an interest in further exchanges on skills assessments and the relationship between measurements versus modelled simulations of employment impacts.

1.5.3. STRENGTHEN2 country-level training on employment impact assessments

Another important activity of the STRENGTHEN2 project is EmpIA training, with the objective of building capacity at the country level to increase the sustainability of EmpIAs and promote social dialogue by engaging with constituents. Participants thus include representatives from governments as well as employers' and workers' organizations. To date, training has taken place in Botswana, Cameroon, Côte d'Ivoire, Malawi, Namibia, Rwanda, Senegal and Zambia. The content of this training was similar to that of the ITCILO courses, with a number of the same presenters, though with a greater emphasis on country-specific developments and priorities. For example, the training in Malawi conducted EmpIAs of the country's Public Sector Investment Programme and participants presented the results of their assessments. In Namibia and Zambia, the training launched new SAMs for these countries, with an additional presentation in Namibia of assessments of a green hydrogen energy project.

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17 See 19th International Conference of Labour Statisticians.

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Chapter

2

Macroeconomic policies for structural and social transformation: From diagnostics to dialogue

Luca Fedi, Iyanatul Islam and Sher Verick

2.1. Introduction

This chapter follows from the ILO's *Macroeconomic Diagnostics for Decent Jobs, Social Protection and Just Transitions: A Practitioner's Guide* (ILO 2024a). The guide makes the case for macroeconomic policies that are not concerned only with a narrow set of monetary and fiscal aggregates. A broader set of metrics is needed for a diagnostic of "macrocritical" policy areas. This chapter goes on to say that broad policy dialogue is needed for broad macro policies. In the spirit of the GEPR series, a review of practices of policy dialogue within governments – and between government and the social partners – is provided, on the intersection of macroeconomic, structural and social transformation policies.

Whether and how dialogue takes place matters for policy relevance and effectiveness. Broad-based dialogue across government as well as with workers and employers as "representatives of the real economy" is necessary to bridge the gap between macroeconomic and structural and social transformation policies. This review of practices of dialogue can inform how stakeholders plan their own engagement and shape governance arrangements for constructive dialogue.

This chapter sets the context by highlighting the global development challenge as manifested in the SDGs and the Paris Agreement. Drawing from the guide, section 2.2 then recalls the evolution of macroeconomic policy as it has evolved through intellectual debates and real-world challenges. There is arguably broader recognition today for macroeconomic policies that are *invested* in long-term development challenges and *proactive* in ensuring that short-term crises do not foil long-term gains. Beyond some broad general principles, it is also clear that no new one-size-fits-all framework has emerged after the Washington consensus. Hence the need for country-level diagnostics and dialogue.

The convergence of macroeconomic and developmental efforts happens where shared diagnostics and effective dialogue take place. Section 2.3 documents practices of dialogue that bring together macroeconomic policy makers and those who operate on the social and structural transformation fronts, as well as with the socio-economic partners the business, employers' and workers' organizations. As in good conversations between persons, there is a time and a place for different types of dialogue between stakeholders.

The convergence of macroeconomic and developmental efforts happens where shared diagnostics and effective dialogue take place.

2.2. Macroeconomic policy for structural and social transformation

2.2.1. The structural and social transformation challenge

Despite rapid recovery from the recession following the COVID-19 pandemic, medium-term growth for high-income and developing countries is projected to be slower than pre-COVID-19. While inflation has moderated from its peak during 2021–22, fiscal pressures have built up. Based on debt sustainability analyses by the World Bank (World Bank, n.d.), 52 developing countries are either in moderate or high risk of debt distress, while 9 countries have an unsustainable public debt burden. The 2024 *Financing for Sustainable Development* report finds that the median debt service burden for least developed countries rose from 3.1 per cent of revenue in 2010 to 12 per cent in 2023 (UNIATF 2024).

At the same time, the financing gap to achieve the SDGs by 2030 is estimated between US$3 trillion and US$4.2 trillion per year (UNIATF 2024). Meeting the clean energy objectives of the just transition by 2050 runs into an additional investment of US$4 trillion per annum (IEA 2021).

Figure 2.1 shows regional aggregates of annual spending needs to meet specific SDGs by 2030, as estimated by the IMF. At 19.4 per cent of GDP, sub-Saharan Africa has the highest financing gap. In all regions, spending needs have gone up between 2019 and 2022, reflecting the impact of the global pandemic.

Country-specific estimates from each region illustrate the relationship between financing gaps and GDP per capita of a country (figure 2.2). The poorest country in the sample (Ghana, from sub-Saharan Africa) has the highest spending needs (more than 16 per cent of GDP), while the richest country in the sample (Bulgaria, from Europe) has the lowest spending needs (less than 2 per cent of GDP). On the other hand, there are significant exceptions. Colombia, which is poorer than Bulgaria, has a financing gap of less than 4 per cent of GDP. At the same time, Ghana and India have similar income levels, but India has a significantly lower financing gap. GDP per capita growth is not sufficient: determined policy choices are needed.

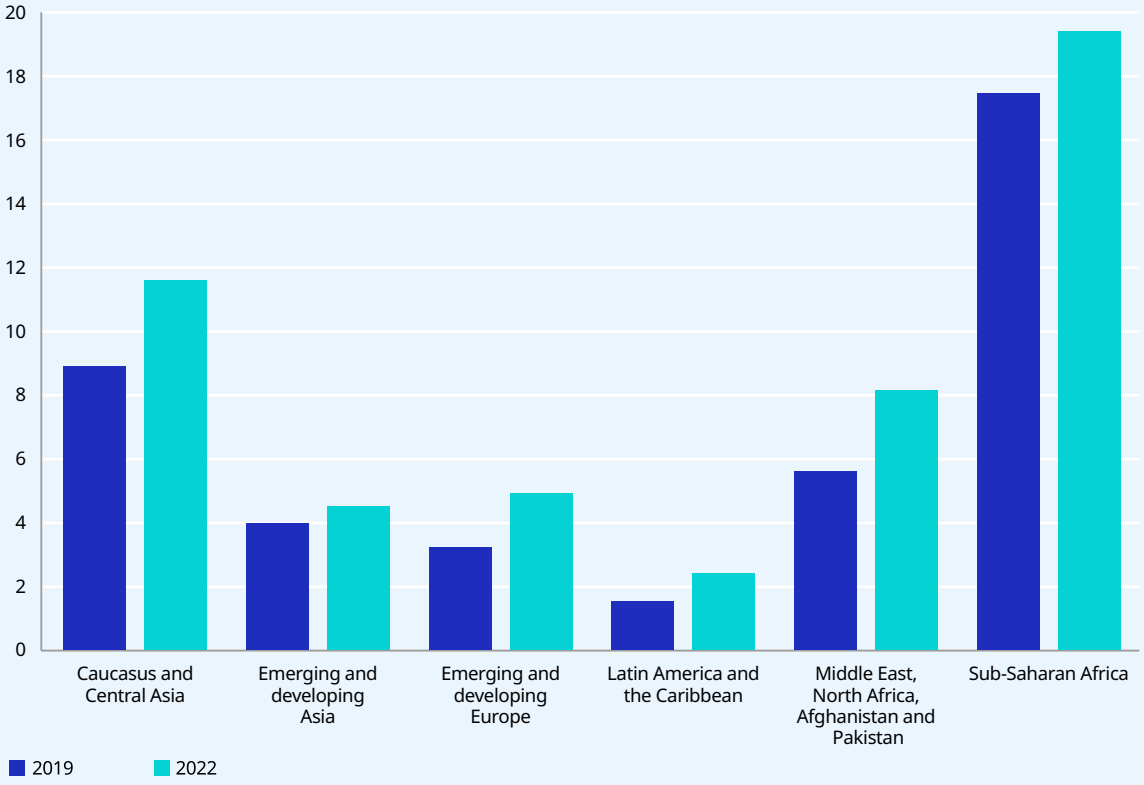
The IMF financing gap estimates do not provide the whole picture: key social protection funding gaps are not factored in. As highlighted in figure 2.3, universal social protection is a massive challenge for low-income countries. Even with Herculean efforts to raise domestic revenue, there is no option other than significant development assistance to complement national efforts in these countries.

Considering some specific countries in figure 2.4, one can observe again how financing gaps can vary among countries with similar income levels. India is a much poorer country than Azerbaijan, yet its financing gap is smaller than Azerbaijan's. In other words, social protection financing gaps are also a policy choice.

2.2.2. Macroeconomic policy shifts in high-income and developing economies

Achieving the SDGs and overcoming the associated financing gaps hinges on macroeconomic policy choices. Global thinking on macroeconomic policy has evolved considerably since the 1980s and 1990s.

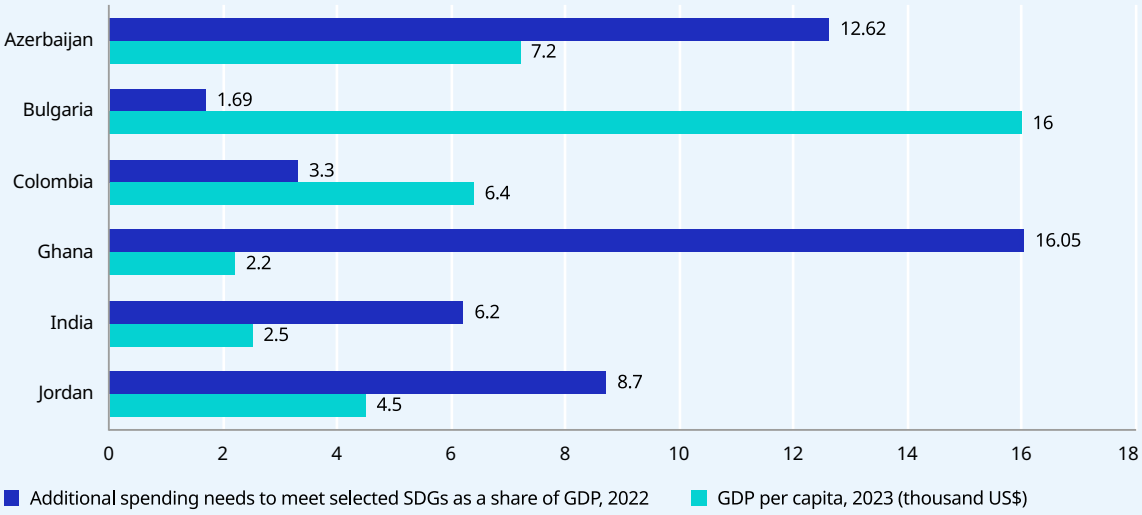
▶ **Figure 2.1. Financing gap to meet specific SDGs by 2030, as a share of GDP, by region, 2019 and 2022** (percentage)



Note: The figure focuses on the SDGs for human capital development (health and education) and physical capital development (infrastructure) – in particular, water and sanitation, electricity and roads.

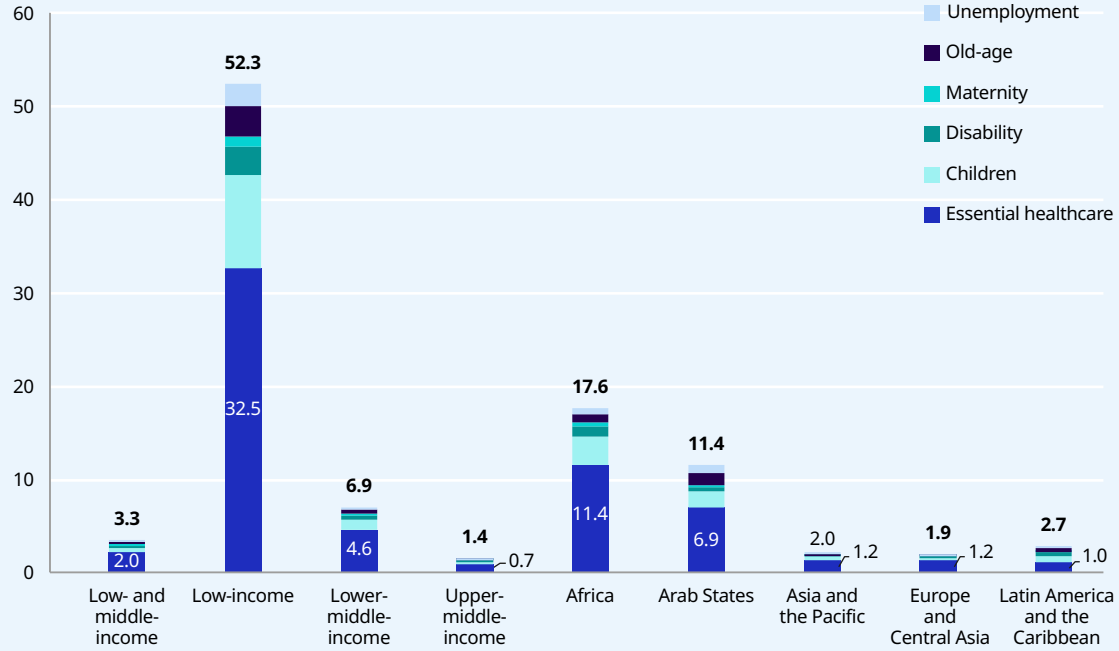
Source: Carapella et al. (2023, figure 2), based on the IMF SDG Costing Tool, second edition (2019) and third edition (2022).

▶ **Figure 2.2. Financing gap to meet specific SDGs, as a share of GDP, 2022** (percentage), **and GDP per capita, 2023** (thousand US$)



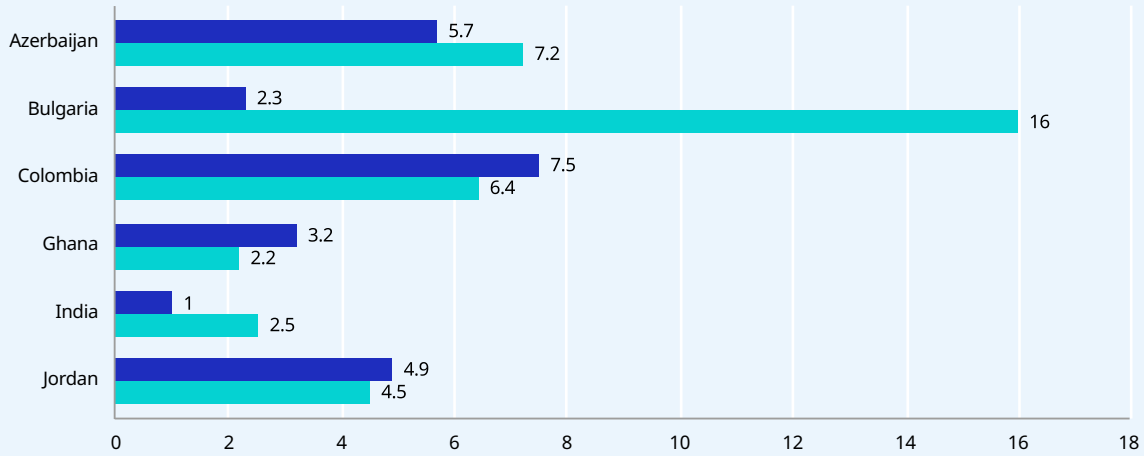
Source: Derived from Carapella et al. (2023) and World Bank, "GDP per capita (current US$)".

▶ **Figure 2.3. Financing gap for achieving universal social protection coverage per year as a share of GDP, by social protection benefit, by region and income level, 2024** (percentage)



Source: ILO (2024b).

▶ **Figure 2.4. Additional spending needs for universal social protection, excluding healthcare, as a share of GDP, 2024** (percentage), **and GDP per capita, 2023** (thousand US$)



Source: Derived from ILO (2024c) and World Bank, "GDP per capita (current US$)".

The predominant paradigm was then a neoclassical concentration on stability as the sufficient or first-order macroeconomic principle; stability coupled with structural liberalization policies were to unleash growth and development.

Macroeconomic policies had to focus on stable macroprices: foreign exchange rates, interest rates and wage rates. In parallel, structural reforms were needed to lift rigidities and distortions, which will allow private actors in an expanding world of free markets to deliver growth, and consequently welfare.

In the 1980s and 1990s, many African or Latin American countries undertook blunt structural adjustment and liberalization agendas – indeed, these had become a condition for continued support from international FIs. Asian countries, for the most part, chose different paths. In his contribution to the 2005 edition of the influential *Handbook of Economic Growth*, Rodrik came to conclude that:

> "reality has been unkind to our expectations. If Latin America was booming today and China and India were stagnating, we would have an easier time fitting the world to our policy framework. Instead, we are straining to explain why unorthodox, two-track, gradualist reform paths have done so much better than surefire adoption of the standard [Washington consensus] package" (Rodrik 2005).

While the neoclassical agenda was failing to deliver in Africa and Latin America, Asia was booming. Asia's impressive economic performance was studied extensively. Two successive landmark reports[18] commissioned by the World Bank attempted to synthesize the key takeaways. The reports point first to the diversity of strategies put in place, rather than to a single Asian "miracle recipe". Some countries relied heavily on foreign direct investment (FDI) inflows (such as Malaysia and Singapore), while others did not (such as Japan and the Republic of Korea). Many Asian countries promoted export-led growth but also import substitution. One key common theme among diverse country-specific strategies is the leading role of an "activist" state. "Unorthodox" macroeconomic policies aimed at maximizing fiscal space for industrial and

18 Birdsall et al. (1993) and Stiglitz (1996).

Macroeconomic policies cannot be concerned only with a narrow set of monetary and fiscal aggregates. Country-specific diagnostics and dialogue need to critically examine how conducive macroeconomic policies are to structural and social transformation.

developmental strategies, through high public investment and fiscal and financial support measures. Fiscal and financial policies rewarded exporters, enterprise creation and growth in sectors considered most critical to overall productivity and productive employment. While promoting domestic savings, Asian countries were also concerned with how these savings were invested in the economy. Currency and capital market management, and the strengthening of FIs were actively pursued to support private investment in productive capacities. Other factors recognized in the literature around the Asian miracle highlight the central role of public–private dialogue in devising, gradually improving or correcting the policy space, as well as policy coordination and strong rule enforcement to keep corruption in check.

More recent research on the Asian success (and disappointment elsewhere) underscores the centrality of productive employment. Per-capita income growth was found to be distinctively stronger in countries that were managing to shift their productive resources, particularly their labour force, towards gradually more productive economic activities.[19] Labour flows from subsistence agriculture to more productive employment are critical to sustained growth, as well as to rising wages, incomes and social conditions.

Macroeconomic policies in high-income and developing economies have been further informed by a better understanding of real-world labour dynamics, particularly as is linked to the relation between unemployment and inflation. In textbook classical economics, involuntary unemployment, persistent working poverty and informality are assumed to be negligible or transitory, or the result of "market distortions" outside the remit of macroeconomic policy. On the other hand, inflation and "wage-price spirals" are considered of preeminent policy concern. Wage–price spirals might have been useful in accounting for persistent inflation in the Organisation for Economic Co-operation and Development (OECD) area in the 1970s, when there was full employment and powerful organized labour. This no longer characterizes most economies today. In the recent inflation surge following the COVID-19 pandemic and the war in Ukraine, analyses by the IMF, the US Federal Reserve, the European Central Bank (ECB) and others have found more profit–price than wage–price effects (Hansen, Toscani and Zhou 2023; ILO 2022; Van Gaal 2023).

A growing literature has made strides in showing how pervasive the monopsony power by firms is, and how it induces wage suppression and declining shares of labour income in GDP.[20] Different typologies of workers have different bargaining power and women are often at a disadvantage, affecting their activity rates, wages and career progression. Minimum wages, collective bargaining, social security and other labour standards are not part of the problem (Calligaro and Cetrangolo 2023).[21]

The need to adapt production systems to the climate imperative, the investment needs associated with the fourth industrial revolution, the COVID-19 pandemic or sovereignty concerns have all but reinforced the notion of an activist, developmental state. The liberalization and structural reform agenda is now

19 See de Vries, Timmer and de Vries (2015); McMillan, Rodrik and Verduzco-Gallo (2014); Ocampo, Rada and Taylor (2009); Rodrik (2005, 2008, 2013, 2022); Rodrik and Stiglitz (2024); Timmer, de Vries and de Vries (2014).

20 See Manning (2020) for a review of the literature; Langella and Manning (2021) on a UK case study; Naidu, Posner and Weyl (2018) on the US experience; and OECD (2022) on the OECD area.

21 An important study by Naidu, Posner and Weyl (2018, 538) finds, for instance, that "monopsony power in the US economy reduces overall output and employment by 13 per cent, and labour's share of national output by 22 per cent".

▶ Box 2.1. Principles

Accelerating progress on the SDGs – in particular, on the creation of decent jobs, social protection and just transitions – hinges on macroeconomic policy choices. These choices can either set back or accelerate development outcomes for societies, including for their most vulnerable. High unemployment, economic insecurity and income losses are not predictors of future wealth, but of hysteresis for labour markets and economies. The scarring of the labour force and the widespread destruction of productive capacities that occur when economic shocks are not actively managed result in delayed and weakened recovery, and erode long-term productive potential.

Macroeconomic policy agendas need to go beyond a narrow and one-sided focus on stability. Also, they need to be both proactive in the short term and engaged for the long haul. A proactive management of the economic cycle prevents short-term shocks from eroding longer-term productive potential and social progress, and provides more fiscal space for investment in long-term transformation. Low productive capacity, low labour productivity and utilization, informality and economic insecurity are macrocritical features that macroeconomic policy needs to address. To do so, macroeconomic policy agendas need to be gender-responsive and recognize that macro-level trends and policy responses affect men and women differently, in particular with regard to labour market outcomes. Social equality, the formalization of employment and enterprises, the green transition and other key developmental goals should also be facilitated. International financial support, including debt relief, needs to support these broader, country-level macropolicy agendas.

There is no one-size-fits-all macroeconomic framework, nor a set of benchmarks that can apply to any country at all times. Policy dialogue to shape and adapt country-specific macro-level configurations needs to extend beyond a narrow circle of fiscal and monetary policymakers and involve the broader group of economic and social stakeholders. These include the ministry of labour and other sectoral/line ministries, and representatives of businesses and workers. A shared understanding of constraints and challenges, opportunities and options across macro and developmental policies, is essential.

Ongoing policy dialogue needs to be informed by evidence on the country's performance and by global knowledge and lessons learned from other countries. The success of macroeconomic policies should be assessed against macro-level fiscal benchmarks and key labour and socio-economic outcomes, including incomes and wages, job quantity and quality, informality, social protection and access to social services, and a just transition.

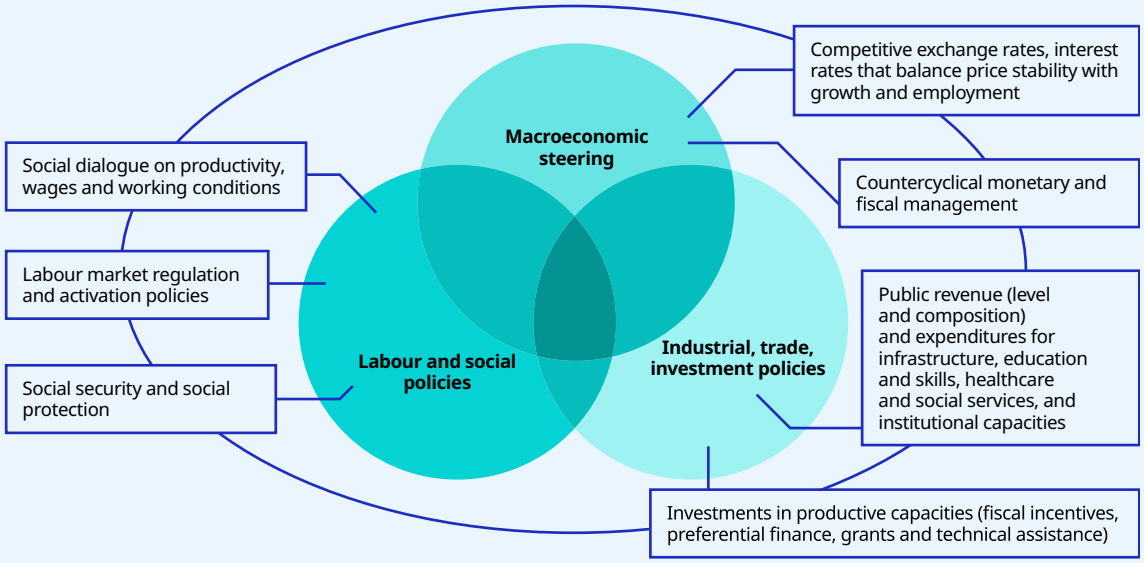
Source: ILO (2024a).

largely considered too single-minded a programme: all developmental challenges cannot be offloaded to the private sector. The case is compelling for an active engagement by the state alongside private actors to bolster productive capacities, by driving investments in critical infrastructure and high-stakes industrial projects, as well as in health and social protection. While no single alternative framework has emerged after the failure of the neoclassical Washington consensus, a review of what has worked well and what has not in terms of macroeconomic and structural transformation policies over the past 50 years allows to draw some key principles.

Macrocritical policy issues

Macroeconomic policies cannot be concerned only with a narrow set of monetary and fiscal aggregates. Country-specific policy diagnostic and dialogue need to critically examine how conducive policy is to structural and social transformation. A broader range of issues need to be considered as macrocritical (figure 2.5).

▶ **Figure 2.5. Macrocritical issues to be considered for macroeconomic policymaking**



Source: ILO (2024a).

2.3. Practices of dialogue

The convergence of macroeconomic and development policies happens when they are conversant with each other. Broad-based macroeconomic policies that are invested in structural and social transformation require broad-based policy dialogue. In the spirit of the GEPR series, we document various practices of such broad-based policy dialogue.[22] The intention is not to evaluate how effective programmes may be with respect to the manner of their stakeholder engagement, but to document more simply *how* the convergence between macroeconomic, structural and social transformation can and does take shape.

Macroeconomic and developmental policies can converge on special occasions, as part of one-off landmark programmes. Opportunities for macrodevelopmental dialogue exist as part of the regular policy cycle of a nation. First, we document two special occasions when broad-based dialogue has been convened, with a particular look at employers' and workers' organizations. Then, we review how macrodevelopmental dialogue can and does happen as part of the regular policy cycle.

2.3.1. Practices of dialogue: Special occasions

Two recent occasions where governments have orchestrated a convergence of macroeconomic, and structural and social transformation goals are reviewed: the Inflation Reduction Act (IRA) in the United States and India's post-COVID-19 economic recovery programme. We look here behind the scenes at how these large programmes came about. We consider first who has done what within the government and then study the role of the socio-economic stakeholders, business organizations, and employers' and workers' organizations.

The IRA – adopted by the United States in August 2022 – aims at accelerating the green transition while promoting good jobs, supporting low-income households and reducing inflation and public deficits. The design of the IRA involved broad engagement across government and close consultations with unions and business representatives, as well as with other environment and other social stakeholders. Characteristically, the Act "ties a short-term macroeconomic issue – inflation reduction, with explicit long-term objectives

22 This extends in particular the discussion in Chapter 1 of the GEPR 2020 (ILO 2020) that considered sectoral policies as a "self-discovery process" based on dialogue among a wide range of stakeholders, and on rigorous analysis.

towards the green transition, job creation and social inclusion" (ILO 2024a). The Act earmarked US$430 billion principally through fiscal incentives, but also in the form of financial assistance, grants and subsidies, and technical support and oversight. It includes a dimension of job creation and job quality (Foster, Maranville and Savitz 2023). The programme's net job impact was estimated at 1.5 million jobs over a ten-year period.[23]

India's public health response to the COVID-19 pandemic has been praised for its ability to roll out a massive vaccination campaign, with 1.5 billion doses administered by January 2022 (Purohit et al. 2022). India's economic recovery programme has also garnered particular recognition. In terms of size, it was second in Asia only to high-income Japan, reaching 10 per cent of GDP, for a total value of approximately US$266 billion.[24,25] Despite having imposed quite stringent lockdowns, India has achieved a stronger-than-average recovery among developing economies (He et al. 2023) and has since maintained relatively high growth rates. The Aatmanirbhar Bharat Abhiyan (Self-Reliant India) programme was launched in phases starting in May 2020, combining macroeconomic, industrial, labour and social protection measures to address short- and longer-term challenges.

Dialogue across the government

The preparation of the IRA involved collaboration between multiple US federal agencies over about one and a half year, as well as close interactions between the President, the White House, the House of Representatives and the Senate (Badlam et al. 2022; Probasco 2023; The White House 2023) (see figure 2.6).

Other agencies involved included:

- the US Trade Representative, covering discussions related to trade provisions – particularly concerning the Buy American provisions, which encourage the use of domestically produced clean energy technologies and components;
- the Department of Agriculture, responsible for devising and implementing programmes for carbon sequestration, reforestation and conservation efforts;
- the Council on Environmental Quality;
- the Federal Energy Regulatory Commission; and
- the Small Business Administration.

The Federal Reserve (the US Central Bank, known as "the Fed") did not publicly contribute or comment on the IRA. However, that should not suggest there was no coordination between US fiscal and monetary policies. A few months prior, the Head of the Federal Reserve, Jerome Powell, had called for "policies with broad appeal that could promote labour force participation and higher productivity, with benefits shared broadly across the nation" (Powell 2019). While "these longer-term issues require policies that are more in the province of elected representatives", he noted, the Fed needed to play its role to "create a favourable environment for investment in both the skills of workers and the tools they have". The Fed's low-interest-rate stance – which, for some, lasted too long as inflation was rising post-COVID-19 – may also be understood as supporting the large public investments involved in the IRA and in other programmes, such as the Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act and the Infrastructure Investment and Jobs Act.

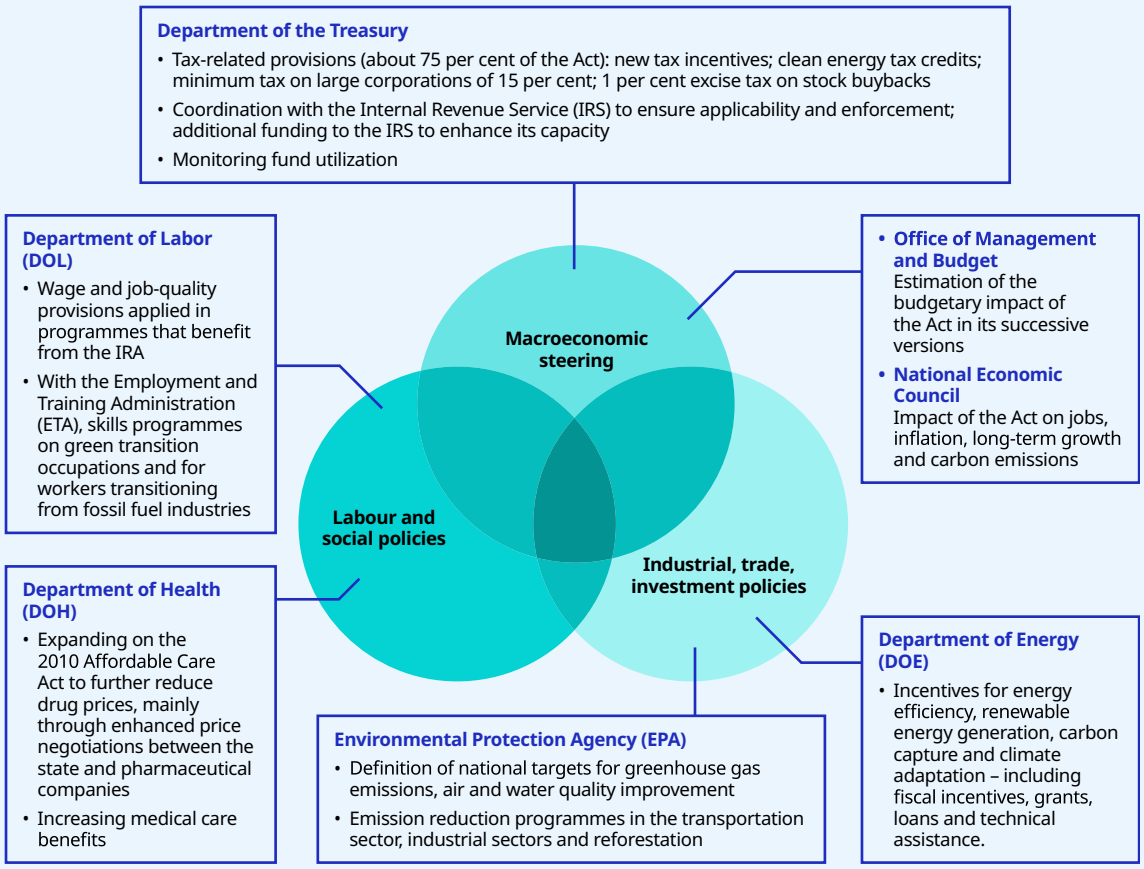
India's economic stimulus and reform programme also involved a broad government effort (Government of India 2024; Invest India, n.d.; PRS 2020). The Indian Ministry of Finance acted as the lead coordinating agency, with support from "NITI Aayog" (the Policy Commission, also known as the National Institution for Transforming India, which replaced India's Planning Commission). State governments were also involved in the design of a programme in which they were expected to play an important implementation role. Still, the programme's design process proceeded fairly rapidly: the programme with its key short- and longer-term components was already announced by May 2020, about a month after the first curfews and travel restrictions were imposed in India.

23 An evaluation of its impact since its adoption has been undertaken. Investment in clean energy and electric vehicles manufacturing has reportedly tripled since the adoption of the Act (see Clean Investment Monitor).

24 See Government of India, "Self-reliant India Programme".

25 The fiscal spending share of the package represented about 1.5 per cent of GDP, with much of the package therefore consisting in incentives and financial measures rather than budgetary stimulus.

▶ **Figure 2.6. Institutional mapping of the US Inflation Reduction Act**



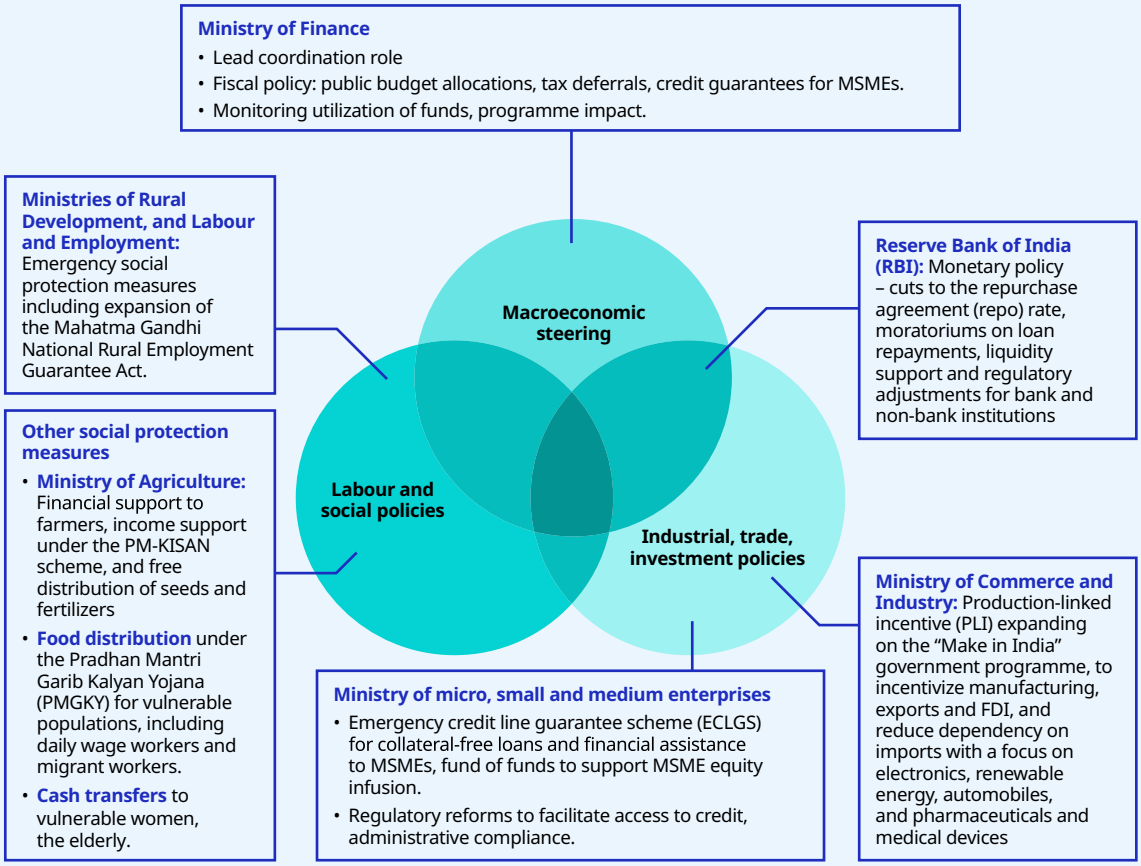
Dialogue with workers and employers

Over the relatively long preparation and negotiation process that led to the adoption of the IRA, business organizations, employers' and workers' representatives have been closely involved. Workers' representatives at the national level – including the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO 2023) and in key sectors (IBEW 2022; USW 2022) – supported the Act and the engagement process. The position of employers' and business organizations was more mixed. The US Chamber of Commerce centred on criticizing the corporate tax hike included in the Act (new minimum rate of 15 per cent of profits for large corporations) and its provisions on drug price negotiations (US Chamber of Commerce 2022). On the other hand, manufacturing organizations – and particularly those in the renewables sector – celebrated "the most transformational clean energy policy in history" (SEIA 2022).

Public–private consultations and roundtables were organized throughout the process for business and workers' representatives to share their views with government agencies as well as with the White House and lawmakers. Business and workers' groups in the clean energy sectors found common ground in advocating for investments and incentives for clean energy projects.

Following the adoption of the Act, the preparation of the implementing regulations was informed by further consultations, organized by the Department of the Treasury (which oversees about three quarters of the Act's budget). Roundtable discussions convened business and workers representatives, private finance, and environmental and civil society groups (US Department of the Treasury 2022a). Discussions considered the applicability of different incentives and support measures, to determine how the measures could best be designed for businesses and workers to effectively access and benefit. The

▶ Figure 2.7. Institutional mapping for the Aatmanirbhar Bharat Abhiyan Programme



▶ Table 2.1. Key issues for employers' and workers' organizations in IRA design

Employers' and business organizations	Workers' organizations
▶ Investments, tax incentives, credit and grants for business growth in renewable energy, electric vehicles, energy efficiency, carbon capture and others	▶ Job-rich green energy transition
▶ Integrating the transition to clean energy within long-term plans for the automobile and other manufacturing sectors	▶ Quality of jobs in new green industries, with right to organize, proper wage standards, registered apprenticeships, and occupational safety protections
▶ Corporate tax rates	▶ Support to workers to transition from fossil fuel industries – including into new energies – as well as to the local communities that relied on those jobs
▶ Drug price negotiation	

US Department of the Treasury also issued public notices requesting inputs on how tax incentives would best be defined (US Department of the Treasury 2022b).

As a crisis response plan whose main provisions were announced shortly after lockdowns were imposed, India's recovery plan did not allow for as structured an engagement process as in the IRA. Overall, the business sector's input was considered as having achieved more visibility compared to what workers had asked for. Business organizations – such as the Confederation of Indian Industry or the Federation of Indian Chambers of Commerce and Industry – showed satisfaction with the plan (CII 2023; FICCI 2020). Workers' representatives – such as from the Bharatiya Mazdoor Sangh, the Indian National Trade Union Congress, the All India Trade Union Congress and others – were more circumspect. Some workers' organizations appreciated having been able to draw attention to social protection and employment issues. However, many also felt that a more structured consultation would have been required and that the plan did not sufficiently prioritize social protection and job preservation measures, particularly for migrant, informal and rural workers.

The design process involved closed-door and public roundtables, mostly online, facilitated by the Ministry of Finance, and involving business organizations and employers' and workers' representatives. The contribution of social partners to the programme also included the publication of public letters, policy memorandums and statements in the media. Responding to a larger set of issues, strikes were organized in rural and urban areas, including against labour law reforms and for more cash benefits. Both unions and business organizations informed the process by conducting surveys and publishing studies on the pandemic's impact. Informal-sector advocacy groups also sought to voice the hardship and needs of daily wage earners and migrant workers.

2.3.2. Practices of dialogue: Across the policy cycle

Beyond landmark policy initiatives, regular opportunities exist for broad policy dialogue on policymaking. Governance and institutional arrangements, political economies or the relative bargaining power of employers and workers, vary between countries. Nonetheless, lessons can be drawn from reviewing the three main occasions for policy dialogue: the annual preparation of the country's budget, the preparation of medium-term expenditure/fiscal frameworks, and the design of longer-term development plans. We discuss the policy and engagement scope of these three

▶ **Table 2.2. Key issues for employers' and workers' organizations in India's recovery programme design**

Employers' and business organizations	Workers' organizations
▶ Fiscal stimulus	▶ Fiscal stimulus
▶ Financial support to businesses, including loan moratoriums and restructuring, preferential and guaranteed credit lines – inputs from Indian Banks' Association	▶ Income support to workers for job loss, income shortfalls – cash benefits, employment guarantee and other social protection measures – particularly for migrant workers (returning from urban into rural areas) and informal economy workers in rural and urban areas
▶ Tax breaks and subsidies for industries hit hard by the COVID-19 pandemic – including hospitality, retail, and manufacturing (particularly for MSMEs)	▶ Labour law (opposing measures towards more flexibility and wage reductions)
▶ Production-linked incentive for long-term industrialization	▶ Universal social security
▶ Business-friendly regulatory reforms, accelerating digitalization	▶ Workplace health and safety measures

regular policy instruments based on a broad review of practices across developing countries.

Medium-term fiscal frameworks and annual budgeting

Many countries maintain medium-term fiscal frameworks as their main macrofiscal policy instrument. Ever since Australia initiated the practice in the 1980s, the MTEFs/MTFFs practice has extended widely, first in advanced economies and then in developing countries. In the last available count (in 2013), 72 countries had adopted MTFFs; the number has continued to grow since.

The authority to determine the direction of the state's finances as part of MTFFs is derived from national parliaments, and most MTFFs are adopted pursuant to a law. However, many an MTFF is devised with limited engagement of, and accountability to, parliaments or representative of employers' and workers' organizations.[26] IMF guidance for the preparation of MTFFs identifies key actors as including: 1) the council of ministers; 2) the macro-fiscal unit within the ministry of finance; 3) the tax and customs authority; 4) spending ministries; 5) the public debt management office; 6) the institute of statistics; and 7) the central bank" (Curristine et al. 2024, 13). Such a perspective entrusts macrofiscal strategies to a narrow circle of players in which the Ministry of Finance plays a predominant role.

In such a process, it is perhaps not surprising that many MTEFs or MTFFs take a narrow view of macrofiscal policy, centring on fiscal stability. According to the IMF, fiscal rules govern MTFFs in 105 countries (Curristine et al. 2024). Fiscal rules such as those advocated by the OECD – debt-to-GDP ratio of 60 per cent, and deficit to GDP of up to 3 per cent (OECD 2015) – are not supported by empirical evidence: low fiscal deficits and debt-to-GDP ratios are not associated with higher growth or faster poverty reduction (see ILO 2024a). These thresholds essentially offer simplicity to complex issues, but in doing so pre-empt a careful analysis and discussion on the challenges and the potential of a specific economy.

Top–down fiscal targets are applied in a static, one-way budgeting model. Ministries in charge of labour, sectoral development, education, healthcare and other developmental domains are considered as "spending" ministries, confining them to a subsequent role. Developmental functions in government also generate revenue and value. Only a few projects, typically large infrastructure projects, are considered as macrocritical – that is, whose feedback effects on growth and fiscal revenue may be estimated and factored in. The effects of other compositional changes in spending and investments, overall demand-side multipliers, labour under-utilization or potential output, are often ignored.

This diminutive take on macrofiscal policy does not need to be the rule. The cases of the EU MTFF, the US IRA or the Indian post-COVID-19 recovery programme are indicative of broadly consulted frameworks that attempt to balance stability concerns with growth, employment and social objectives. MTFFs need to be designed in a dynamic and iterative process. Choices made on the level and composition of spending and revenues have diverse effects, which need to be understood. The Budget Lab in the United States has recently been set up to support a shift from what they identify as "conventional" or "static" budgeting approaches towards "dynamic" approaches that "reflect macroeconomic feedback – how policy changes would affect the economy as a whole".[27]

Our review of MTEFs/MTFFs in developing countries suggests that the participation and oversight of parliamentary and socio-economic representatives is limited and piecemeal. This may be the product of prevailing political economies but is also amenable to change: fiscal frameworks should be an expression of the public will in a democratic context. In South Africa, the parliament does play an important role in reviewing and validating the MTFF, though the South Africa's National Economic Development and Labour Council is considered to be largely circumvented (SAICA 2022). The process is steered by the Ministers' Committee on the Budget (the MinComBud). The MinComBud is chaired by the Minister of Finance but includes the key line

26 In its recent review of practices and guidance on MTFFs (Curristine et al. 2024, 12), the IMF finds that in 41 per cent of countries MTFFs do not involve parliamentary oversight, or that the laws governing MTFFs do not require a parliament review "for information or approval".

27 See the Budget Lab, "Types of budget estimates".

▶ **Table 2.3. A typology of fiscal frameworks**

	Purpose
National development plans (NDPs), link with SDGs, UN development assistance frameworks, and integrated national financing framework (INFFs)	Many countries devise long-term development plans spanning two to three decades. NDPs typically aim for comprehensiveness and at consolidating the policy plans of all the developmental ministries. With the exception of a few planned (or semi-planned) economies, these frameworks do not include explicit, binding macrofiscal commitments or a macrofiscal strategy. NDPs outline a large set of long-term developmental objectives or outcomes, with end-of-period socio-economic targets and intermediate milestones. In some countries, the long-term plan is further spelled out into shorter (five- or ten-year) plans. In most cases, NDPs align with the global SDGs, and may specify national targets based on the SDG indicators framework.
Medium-term expenditure and fiscal frameworks (MTEFs and MTFFs)	Many developing countries now maintain MTEFs and MTFFs (Curristine et al. 2024; World Bank 2023) as their main macrofiscal policy document. These fiscal frameworks aim at aligning government budgets and macroeconomic parameters over a period of three to five years. Such a time frame allows for meaningful macroeconomic projections to underpin revenue and expenditure plans over multiple years. Economic growth projections are outlined, together with targets for revenue, expenditure, deficits and debt. In some cases, an economic and social development strategy is substantiated.
Annual budget	The preparation of the annual government budget is among the primary responsibilities of any government. It involves all ministries as well as a close interaction with the legislative branch and the chief of state. The preparation of the government budget entails three levels of discussion: a) how and how much the government can and should raise its revenue (mostly through taxes); b) whether to run a deficit and by how much (by borrowing internally and/or internationally); and c) how to allocate the budget by government entity, programme or objective.[28] Following its adoption, regular government and parliamentary activity should report and monitor progress. Spending delivery and progress on expected results and outcomes should be regularly disclosed and discussed.

28 Performance-based or objective-based budgets allow linking and monitoring expenditures with specific objectives or programmes. Indicators of performance or of advancement against the results are defined. Where there is no detailed objective or outcome-based budgeting framework, budgeting exercises inform on what is spent against which objectives (and not what *should* be spent).

Policy scope	Participation
The fiscal or financial means to achieve the envisaged outcomes are normally out of the purview of the plan. Developmental aspirations are thus not tied to a specified macrofiscal strategy. When the authority leading their preparation is not also in charge of the medium-term and annual budgeting exercises, the link is tenuous between this long-term planning and the medium- and shorter-term macrofiscal frameworks (see below). In some countries, an INFF is prepared to complement the NDP. INFFs typically outline financing options, especially financial mechanisms that may be explored, but do not outline a full-fledged macrofiscal strategy.	The timeline for the design of NDPs usually allows ample time for the participation of a broad constituency, including all the social and economic ministries and agencies, the social partners and the civil society (see, for example, Serrano and Marasigan (2024)). Development partners, including UN agencies, are often closely engaged as NDPs form the basis for UN and development partners' country strategies.
MTFFs can and should be a key instance for macrodevelopmental dialogue. They should allow for careful consideration of the fiscal space, how it may be utilized for structural and social transformation, and the social and economic returns on investments (including in terms of government revenue and cost savings). However, MTFFs may be conceived as instruments of fiscal discipline, focused primarily on fiscal stability. In such cases, pre-emptive, top–down deficit and debt ceilings frame the whole exercise. The macrofiscal framework is not functional to an economic development strategy but governed by extraneous fiscal targets.	The predictable preparation calendar for a three-to-five-year plan should allow for a structured, broad engagement process. Yet, across countries, the scope of engagement with stakeholders varies considerably, from a mostly closed-door exercise involving only a handful of players to a more inclusive process. Also, MTEFs/MTFFs may be framed in highly technical terms that limit the ability of many stakeholders to engage.
The preparation of the budget is a key time and place for macrodevelopmental dialogue. Coordination with monetary authorities is also fundamental for the short-term management of the economic cycle. The complex process is often affected by inertia: "recognized shortcomings of annual budgeting includes incrementalism, shortsightedness, and failure to consider the medium-term consequences of current year decisions" (Curristine et al. 2024). The composition of the budget (allocations to government outcomes, or functions, programmes or ministries) are largely based on established practice.	Meaningful participation is constrained by a fast-paced and relatively short elaboration process. All government entities are typically engaged, as well as senior political levels in the executive and legislative branches. Whether or not the social partners and other actors are involved varies. In countries where socio-economic councils exist, they are typically involved, though their mandated role and actual influence varies.

▶ Box 2.2. The EU MTFF and the European social partners

The current medium-term fiscal framework of the EU 2021–27, titled "NextGenerationEU", was resolutely supported by European employers' and workers' organizations. In December 2020, as the policy document was submitted for approval to Member States, the EU's federation of workers organizations (ETUC) and BusinessEurope, representing EU employers, came together to issue the following joint statement: "the European social partners urge member states to endorse the agreement found on the European recovery fund and Multiannual Financial Framework for 2021–2027", explaining that "European enterprises and workers urgently need[ed] the EU financial support foreseen in this agreement. [...] It [was] the time to deliver the compromises found for the common good of all Member States".

EU-level MTFFs were initiated following the signature of the treaty of Lisbon in 2009.

ministries in the discussions on trade-offs and prioritization of resources. The Budget Council and the Budget Forum are additional platforms of consultation involving the national government and the provincial and local administrations. They focus on the equitable territorial distribution of resources and the fiscal sustainability of provincial governments. Efforts to ensure a more central role for the National Economic Development and Labour Council (Nedlac) have not abated, with for instance the National Tax Committee claiming in respect to the 2023 MTEF that "principles for budgets and budget priorities should be agreed at Nedlac as part of our Constitutional framework and our nationally adopted principles of a Social Compact" (SAICA 2022). Nedlac is also proactive in exercising its role on macrofiscal policy. One important contribution is through its regular report on Economic and Employment Trends in South Africa, and the related discussions at the Council (Nedlac 2024). The report usefully tracks key macrofiscal indicators (debt to GDP, bank deposits and loans, current account balance, total budget spending and revenue and composition of spending and revenue) together with economic and employment indicators (GDP growth, unemployment by age, employment by industry, main exports, and investment in research and development).

Meaningful engagement is often about early engagement, to come to a shared understanding of the context and on the key policy trade-offs. Pre-budget consultations or similar early dialogue platforms are conducted in many countries. These can involve online or in-person meetings, or calls for written contributions, normally organized by the Ministry in charge of the budget. In India, regular pre-budget consultations involve representatives from employers' and workers' representatives and business organizations, among other stakeholders. This provides an early entry point to discuss key concerns and priorities for workers and enterprises on the range of key issues. In 2024, ten national workers' organizations came together under the Joint Platform for Central Trade Unions and Federations to submit a joint memorandum to the Finance Ministry as part of pre-budget consultations. Where a formal pre-budget platform is not common practice, social partners can make sure their perspectives are heard early on. The South African employers' and business membership organization BUSA often issues a pre-budget communiqué to the Minister of Finance highlighting their take and expectations (BUSA 2023).

Multi-year macrofiscal forecasts

Multi-year macroeconomic and fiscal forecasts are central to MTFFs and annual budgeting. The way these projections are made varies widely between countries. In advanced economies, complex economic models are maintained for this purpose. In many countries, forecasts may be done using simple spreadsheets.[29] Whatever the method, a critical examination of the assumptions used is an integral part of fiscal policy dialogue. Even the most complex models have blind spots, and need regular updating; and the use of spreadsheets does not forego dynamic, iterative forecasting and budgeting.

In countries where these discussions are informed by macroeconomic models, it is critical that their

29 Such as with the "spreadsheet-based projections tool" presented in Curristine et al. (2024).

▶ Box 2.3. Expenditure reviews

Spending or expenditure reviews (ERs) are increasingly used to review the efficiency, cost-effectiveness and relevance of regular government expenditure, ultimately to allow governments make better resource allocation decisions. ERs can be conducted as all-round exercises or focus on a specific objective, such as gender equity, greening or employment promotion.

Employment ERs first seek to estimate "employment-related" spending, often scattered across multiple budget functions, and then to map such spending against key policy objectives, including where a national employment policy is in place.

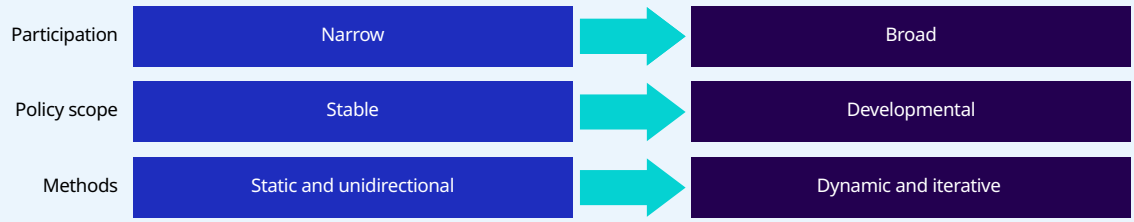
They can therefore usefully contribute to MTFF design and monitoring, improving the way countries understand their employment-related expenditures. Please refer to Chapter 3 for more on this methodology.

strengths and limitations be correctly appreciated by stakeholders. A neoclassical model (such as a simple CGE model) is a supply-side model that ignores by design demand-side constraints and dynamics. Inferring from such a model that what a country needs is a supply-side shock is a logical fallacy, a form of circular reasoning. Most CGE models are based on the Cobb–Douglas production function and, at its heart, a measure of multifactor productivity (MFP) is considered as a proxy for technical change. But there are quite distinct methods used from one country to another to measure residual MFP, and the most commonly used ones tend to overestimate the contribution of technology and underestimate the contribution of production factors themselves, particularly of labour inputs (ILO 2024d). Another common short cut in different models concerns labour market dynamics. In many models, the labour market is treated as any other market that automatically clears itself. But unemployment and labour under-utilization cannot be assumed to be the mere result of rigidities (also known as labour laws) and high wages, including in countries where the majority of the workforce is in the entirely unregulated informal economy, earning bare subsistence incomes. Chapter 3 discusses macroeconomic models at much greater length particularly on the merits of models that explicitly recognize structural (for example, sectoral) dynamics.

Ultimately, whether model-based or not, the plausibility of the forecast is always subject to discussion. Many macrofiscal forecasts have turned out too rosy. Many plans keep on assuming that fiscal prudence is the most prudent path, durably keeping economies in low-productivity, low-income traps. Groups of experts with similar backgrounds and converging interests can lead to group thinking. Ensuring an open, broad and evidence-based dialogue is essential for realistic and relevant strategies.

In an iterative and broad-based process, forecasts on aggregate growth, revenue and spending need should connect with the developmental strategy encompassing industrial, labour and social policy plans. Industrial, labour or social protection policies should not merely take macrofiscal conditions as a given. Structural and social transformation policies have short- and long-term macroeconomic feedback.

▶ Figure 2.8. A typology of fiscal frameworks



It is thus critical that a dynamic and iterative discussion of public revenues and expenditures takes place, to consider:

- the size and composition of the budget and the return on growth, jobs and revenue: As noted in ILO (2024a), "an extensive literature indicates that fiscal multipliers are positive (>1) in recessions, and debt-funded countercyclical spending does make sense economically, as the recovery from the COVID-19 crisis has again illustrated". Moreover, different types of spending have different multiplier effects. An increasingly large literature underlines the importance of public spending, incentives and investments on productive capacities while the much-discussed "crowding-out" effect has found no empirical demonstration. Social spending needs and their return on investments deserve similar attention.

- the level of revenue and its sources, and their return on growth, jobs and revenue. ILO (2024a) reviews the current literature on government revenue, particularly on taxation; overall and as stipulated by the IMF, in most developing countries "there would appear to be scope for increasing the progressivity of income taxation without significantly hurting growth" (IMF 2017, 13). In many developing countries, there is room to increase personal and corporate income, wealth, and consumption taxation with no impact on the propensity of the private sector to invest. On the contrary, these resources are needed for transformative macrodevelopmental policies that can stimulate additional private investments.

Central banks

A principle of central banking in many countries is that monetary policy should be accountable to the public interest but maintain operational independence. Central banks are typically set up as independent from the government and tend to stay away from non-monetary public policy discussions. Yet, the principle of coordination between fiscal and monetary policies is broadly accepted. Most monetary isolationists were won over to this argument by the global financial crisis and the euro crisis (see ILO 2024a). A conducive monetary policy is essential to achieving sustained structural change, job creation and social inclusion.

Our review of prevailing central bank practices across developing countries suggests that their level of engagement with the structural and social transformation agendas varies to a large extent, irrespective of their constitutional set-up (whether independent or not) or functional mandate (dual or hierarchical). As we have seen, the US Fed has not been formally involved with the IRA, while the Indian Reserve Bank assumed an important role in the Indian recovery programme. Both banks are established as autonomous from the government although the Fed's dual mandate for price stability and full employment is arguably broader than the Indian Reserve Bank's flexible inflation targeting remit.

Given the special status of central banks in the public policy landscape, it is useful to consider specific practices of dialogue between central banks and socio-economic stakeholders. One prominent case is that of the European "macroeconomic dialogue", established in its present form in 1999. Twice a year, it gathers the principals of the ECB, the presidency of the European Council, the European Commission and European social partners, including the ETUC and BusinessEurope. The dialogue is described as enhancing mutual understanding and policy coordination on economic developments, economic and monetary policy, and labour market issues. As part of this platform, the ETUC "pushes for the continuous involvement of European and national social partners in the development of EU macroeconomic policy".[30] BusinessEurope makes use of these occasions to present their own semestrial Economic Outlook (BusinessEurope 2024). For EU institutions, the meeting is seen as fulfilling their duties for democratic accountability and stakeholder engagement. In the perspective of the ECB, "dialogue [...] with other policymakers and social partners provides an opportunity for the ECB to gain information and insights and explain its monetary policy decisions, while it allows the counterparts to improve their understanding of the ECB's actions".[31] The meeting typically reviews EU-wide economic performance, including inflation, growth and employment and wage prospects.

30 See ETUC, "Macroeconomic Policy".

31 See European Central Bank, "European Cooperation".

▶ Box 2.4. Monetary policy committees

In some countries, central bank policies related to interest rates, currency management and financial regulation are determined by monetary policy committees (MPCs). The size and decision-making structure of MPCs varies across countries and regions (table B2.4.1). The MPCs are dominated by internal bank staff and economists. In some cases, they may include representatives from the business community and, in others, there are no external members. There is no case where representatives of workers or civil society are part of the membership of MPCs. Also, the degree of gender parity is typically low in MPCs.

▶ Table B2.4.1. Composition of monetary policy committees, selected central banks

Country	Board/MPC	Year adopted	Number of experts	External members	Decision-making process
Canada	Governing Council	1994	6	0	Consensus
Euro area	Board	1998	25	0	Consensus
India	MPC	2016	6	3	Vote
Israel	MPC	2010	6	3	Vote
Japan	Board	1942	9	6	Vote
New Zealand	MPC	2019	7	3	Consensus
Norway	MPC	1999	8	5	Consensus
Korea (Rep.)	Board	1950	7	5	Vote
South Africa	MPC	1999	7	0	Vote
Sweden	Board	1897	6	0	Vote
Thailand	MPC	2008	7	4	Vote
United Kingdom	MPC	1997	9	4	Vote
United States	Federal Open Market Committee	1933	12	0	Vote

Source: Gai (2023)

Participants address key policy convergence and coordination issues, such as balancing inflation control with the need for economic growth and job creation, increased investments and the stability of the euro, as well as key social concerns, such as inequalities, precarious work, social protection or the green transition.

At the international level, calls for "pro-employment macroeconomic policies and increased public investment", are central to ITUC's advocacy, as well as "support [...] for countries to expand their fiscal space through progressive taxation, strengthened international tax coordination, comprehensive debt relief, and a reformed international financial architecture".[32] The International Organisation of Employers also engages on macroeconomics (see IOE 2020a, 2020b).

Our review did not reveal cases of regular dialogue platforms involving central banks and employers' and workers' organizations in developing countries. Central banks are often members of institutions and committees overseeing public pensions or insurance funds, labour and wage determination bodies. Socio-economic stakeholders seldom

32 See ITUC, "Economy".

participate in monetary and macroeconomic discussions with central banks. Dialogue can take many forms though. As part of their efforts to improve transparency and accountability, some central banks do consult with a wide range of stakeholders, including social partners. Following a review of 20 years of central bank practice in the Americas, the Bank of International Settlements recommends that "central banks need to listen to a wide range of stakeholders" (Macklem and Vardy 2023).

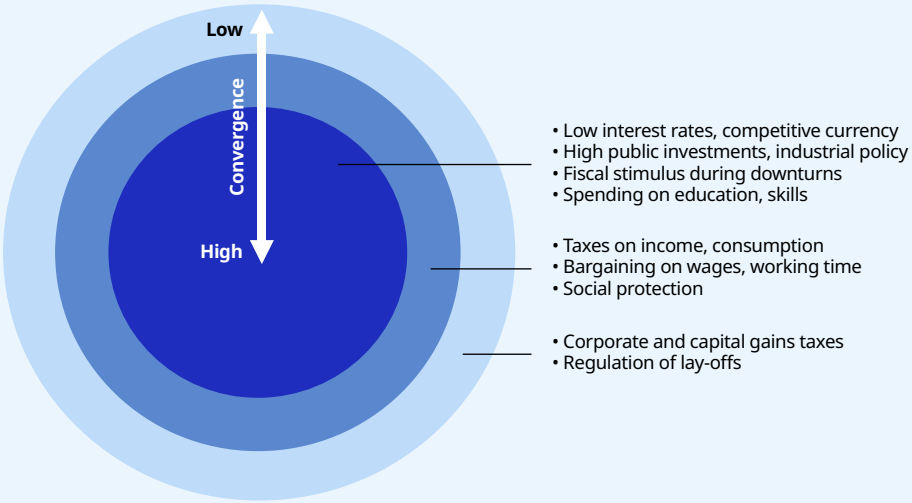
Employers' and workers' organizations can convey their positions on monetary policy in a variety of ways. Critically, they need to be able to discern the implications of central bank policy on interest rates, the exchange rate and financial policy, to formulate a coherent stance. That is where particular support from the ILO is critical, as many employers' and workers' organizations lack the technical capacities to formulate coherent macro positions cognizant of the trade-offs for workers and businesses.

Employers and workers

Employers' and workers' organizations are often pictured in a tug of war over finite resources. Indeed, the negotiated sharing of economic gains is essential to effective economies and inclusive growth (ILO 2024b). But business, employers' and workers' organizations are not strictly interested with issues of collective bargaining, such as wages, working conditions or skills programmes. They are also concerned with macroeconomic and structural transformation agendas. The ILO's Consultation (Industrial and National Levels) Recommendation, 1960 (No. 113), encompasses "the elaboration and implementation of plans of economic and social development". Recent research by Eurofound (2022) analysed labour disputes in the EU, Norway and the United Kingdom. It compiles 230 instances of national-level demonstrations, strikes and other industrial action taken by workers' organizations. A total of 30 per cent of disputes were related to "government policies, including austerity measures and pension reforms" as distinct from disputes related to collective bargaining issues. ILO (2024e) also documents the participation of employers and workers on social and economic issues at large, on the basis of a survey of social partners organizations worldwide. It finds that "peak-level social dialogue [...] can strengthen policy coherence across government actors by balancing economic growth and social progress".

We have reviewed employers' and workers' public stances on the macrocritical policy areas as suggested in this chapter. Employers and workers can be seen to converge on a broad set of macrocritical policy issues, as illustrated in figure 2.9. Employers and workers can join forces to advance a core set of common interests, as seen for instance in the cases of the "NextGenEU" or in the renewable energy sector when negotiating the IRA. Growing the cake helps when it comes to sharing it.

▶ **Figure 2.9. Convergence between employers and workers on macrocritical policy issues**



2.4. Conclusion

Whether and how policy dialogue takes place matters for policy relevance and effectiveness. Broad-based dialogue across government as well as with employers and workers (as representatives of the real economy) is necessary to bridge the gap between macroeconomic and structural and social transformation policies. This review of practices of dialogue can inform how single stakeholders may plan their own engagement and to shape governance arrangements for constructive dialogue.

The chapter set the context by highlighting the global development challenge manifested in the SDGs and the Paris Agreement. In all likelihood, macroeconomic policy needs to engage for the global community and individual countries to stand a chance. A review of global thinking and practice suggests that, by and large, a stronger consensus has formed in favour of more engaged and proactive macroeconomic policies.

Policy convergence requires an interactive and dynamic determination of macroparameters and of structural and social transformation policies. A review of practices indicates, instead, that static and one-way fiscal frameworks are much more common. Debt and deficit ceilings are still too often defined extraneously from country-specific considerations of needs and potential. These targets or rules then impose themselves on structural and social policies whose potential feedback on short-term macrofiscal parameters and on longer-term macroresilience is overlooked. As for monetary and financial authorities, they still too often content themselves with self-centred, narrow goals, the achievement of which does not pre-determine sustained development.

Examples of broad-based dialogue and engagement have been garnered to document how a convergence between macroeconomic, social and structural policies may take place. One can learn from instances of structured engagement among broad constituencies to shape large macrodevelopmental initiatives. Regular opportunities for broad-based policy dialogue around the policy cycle are also reviewed considering long-, medium- and short-term macrofiscal and developmental frameworks.

Whether and how policy dialogue takes place matters for policy relevance and effectiveness. Broad-based dialogue across government as well as with employers and workers (as representatives of the real economy) is necessary to bridge the gap between macroeconomic and structural and social transformation policies.

The organizations representing the "real economy" are acutely conscious of how much is at stake for workers and enterprises. Weighing in on macroeconomic determinations requires capacities, a fine-brush understanding of trade-offs across the macroeconomic and developmental spheres, and an understanding of the technical processes and tools. Though they are often considered better endowed, ministries of finance and central banks can also lack understanding of the real economy and labour markets. Expertise needs maintaining, in-house or via partnerships. Thus, international organizations and development partners have a role to play in supporting institutional spaces, instruments and capacities for constructive, broad-based policy dialogue.

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Chapter

3

Financing development: The role of pro-employment budgeting and employment-related public expenditure reviews

Eléonore d'Achon, Mauricio Dierckxsens and Kee Beom Kim

3.1. Introduction

Developing countries across the world face critical challenges in financing their development needs. By one estimate, the gap between the collective resources required to meet the SDGs and the actual financial resources available to these countries (the financing gap) is US$4 trillion annually (UNCTAD 2023). The annual financing gap to achieve universal social protection, which is at the heart of the SDGs, in low- and middle-income countries alone is estimated at US$1.4 trillion, or 3.3 per cent of GDP (Cattaneo et al. 2024). The financing gap is not only vast but also growing – with the gap estimated at US$2.5 billion per year just prior to the adoption of the SDGs in 2015. The COVID-19 pandemic and the subsequent confluence of crises, including the cost-of-living and climate crises, have exacerbated the financing gap, as have other factors such as low domestic resource mobilization, high debt burdens and insufficient international assistance.

At the same time, labour markets in developing countries are marked by multifaceted challenges, including high levels of labour under-utilization, underemployment, informality, working poverty and other DW deficits. Young people, women and rural populations often struggle to access quality employment opportunities, while many economies are unable to create enough decent jobs to absorb their fast-growing labour force. The lack or slow pace of structural transformation – the reallocation of resources and labour from low-productivity to higher-productivity activities, which is essential for sustained productive job creation in developing countries – hinders these countries' ability to transition to higher-value economic activities. This keeps a large portion of the workforce in low-productivity, informal jobs with limited prospects and reduces the state's capacity to mobilize domestic resources through taxation. Addressing all these challenges and achieving the related SDGs, including SDG 8 (inclusive growth and DW) and SDG 9 (industrialization and innovation), are dependent on many factors including appropriate policies and institutions, but adequate financing plays a vital role.

This chapter will take stock of the evolution of the financing panorama, identifying the key factors behind the persistent financing gap in developing countries. It then explores the innovative tools of PEB with a focus on public ERs, which aim to maximize impact without necessarily increasing expenditures. The chapter concludes by drawing some policy lessons from the analysis.

3.2. Development financing gaps in developing countries

The financing gap in developing countries exists for several reasons, ranging from domestic economic factors (such as narrow tax bases) to external factors – such as an international financial architecture that perpetuates structural inequalities benefiting wealthier countries at the expense of poorer countries and that, as a consequence, has not been sufficiently responsive to the challenges faced by developing countries in closing the SDG financing gap. As a result, the Pact for the Future adopted by the UN General Assembly calls on widespread reforms to the international financial architecture.[33]

3.2.1. Domestic factors contributing to the financing gap

Many factors lie behind the financing gap in developing countries, including low domestic resource mobilization as a result of weak taxation systems, extensive informal economies and inefficient public financial management. Debt sustainability issues, low domestic savings and limited structural transformation also add to the financing gap.

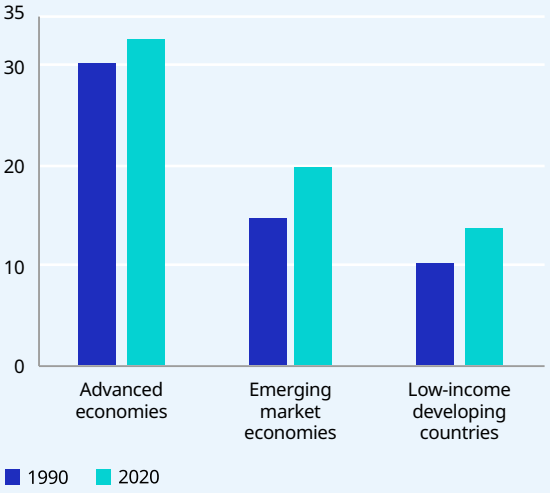
Weak taxation systems

Many developing countries have low tax-to-GDP ratios compared to high-income economies. In low-income developing countries, the ratio in 2020 stood at 13.8 per cent, compared to 19.7 per cent in emerging market economies and 32.5 per cent in advanced economies (figure 3.1, panel A). Furthermore, the ratio in low-income developing countries has risen to a smaller degree compared to emerging market economies, having increased by 3.5 percentage points compared to almost 5 percentage points in emerging market economies. The low tax intake is due to various factors, including poor tax administration and widespread tax evasion. The tax base often also remains narrow, with excessive dependence on consumption

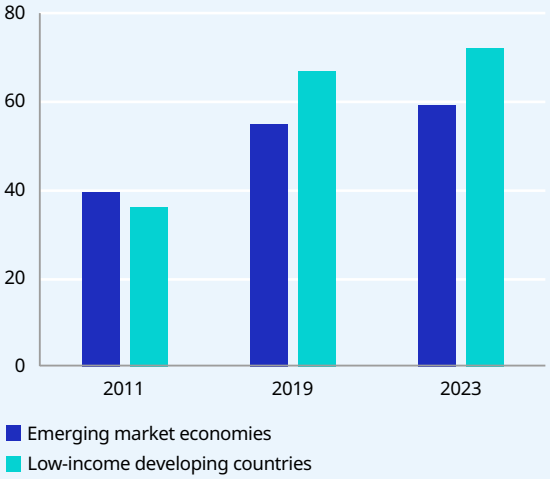
33 For more details on the proposed reforms to the international financial architecture, see UN (2024).

▶ **Figure 3.1. Tax revenues as a share of GDP and debt-to-GDP ratios** (percentage)

A. Tax revenues as a share of GDP



B. Debt-to-GDP ratios



Source: Benitez et al. (2023); Mawejje (2025).

taxes (such as value-added taxes) and insufficient taxation of wealth and capital, all of which constrain public funding for development. Initiatives, such as the Global Minimum Tax initiative and the UN Framework Convention on International Tax Cooperation, provide opportunities for international cooperation on broadening the tax base.

Large informal economies

Extensive informality in developing countries also deprives governments of critical revenue streams. In low-income countries, informal employment is estimated to account for the vast majority of total employment – 88.3 per cent.[34] This means that a large proportion of potential taxpayers do not or cannot contribute to the government's revenue base. In high-income countries, the corresponding rate is 12.9 per cent. Furthermore, informal workers and enterprises often have less access to credit, training and career advancement opportunities, which can trap them in a cycle of low productivity and limit their future earnings potential, and by extension, future growth in the tax base.

Inefficient public financial management

Even when revenue is collected, poor public financial management can limit the effective use of these funds. Misallocation of resources, corruption and weak budgeting processes often result in inefficiencies that prevent funds from being directed towards identified development needs and priorities. Furthermore, informal economies are difficult to monitor and tax due to administrative limitations and high compliance costs. Expanding tax-collection efforts to include informal-sector activities would require additional investments in public financial administration and management.

Public debt

Many developing countries face high levels of public debt, which limits their ability to borrow further to finance development needs and priorities, while rising debt-servicing burdens crowd out development financing. Debt burdens are further compounded by volatile commodity and currency depreciations. Developing countries with high levels of external debt are particularly vulnerable to currency depreciations as they increase the cost of servicing foreign-currency-denominated debt, further straining public finances and widening the financing gap.

Exceptionally loose global financial conditions following the global financial crisis of 2008 led many developing countries to take on additional debt

34 ILOSTAT, ILO modelled estimates, November 2023.

(Chuku et al. 2023). Spending pressures following the COVID-19 pandemic and the rise in global food and energy prices led to developing countries assuming even more debt. As a consequence, government debt relative to GDP in emerging market economies increased from 39.0 per cent in 2011 to 59.0 per cent in 2023, while the ratio increased even faster in low-income developing countries, from 36.3 per cent to 72.3 per cent in 2023 (figure 3.1, panel B). Rising debt levels coupled with tightened financial conditions following globally synchronized monetary tightening have meant that sovereign borrowing costs have increased substantially for developing countries while leading many of these countries to devote an increasing share of their revenue on debt servicing. In fact, according to UNCTAD (2024a), a record 38 per cent of all developing countries allocated 10 per cent or more of government revenues to interest payments and some 3.3 billion people now live in countries that spend more on interest payments than on either education or healthcare. Tightened financial conditions have led to more than half of low-income countries being at high risk of or in debt distress, while one in four middle-income countries was at high risk of fiscal crisis as of the end of 2022 (UNIATF 2023).

Low savings

Low saving rates in many developing countries also constrain the pool of funds available for investment. Many low-income countries rely predominantly on the banking sector to channel savings into investment, while capital markets often remain underdeveloped. Furthermore, even the limited savings tend to flow outward toward global financial centres, resulting in the paradox of capital flows from poorer to richer countries (Prasad, Rajan and Subramanian 2007). These limitations and financial volatility in many developing countries restrict both public and private long-term financing and investment. In turn, as these are critical in particular in underpinning the long-term nature of structural transformation, they impact labour market outcomes.

Slow pace of structural transformation

The lack or slow pace of structural transformation in developing countries also exacerbates financing challenges. When the process of structural transformation itself is stalled, countries remain dependent on traditional sectors (like agriculture and the informal economy), which typically generate lower income and tax revenue. As a result, the state's fiscal base remains narrow, limiting its ability to invest in sustainable development. Moreover, the absence of structural transformation leaves economies more vulnerable to external shocks, such as commodity price fluctuations, which can destabilize public finances. Additionally, inadequate structural transformation can restrict access to international financing, as countries with low levels of economic diversification are often perceived as high-risk by international investors and lenders, leading to higher borrowing costs and reduced access to credit.

3.2.2. External factors contributing to the financing gap

In addition to domestic factors, developing countries face several external challenges that exacerbate the financing gap. These include volatile international capital flows, insufficient foreign aid, global macroeconomic instability and the growing impact of climate change.

Volatile international capital flows

Developing countries are highly dependent on external sources of financing, such as FDI, portfolio investment and remittances. However, these financial flows are often unevenly distributed, volatile and subject to global market fluctuations, political risks and changes in investor sentiment. During the 2008 global financial and economic crisis, capital outflows from developing countries surged. In the following years, amidst a low-interest environment in advanced economies, capital inflows to developing countries increased as investors sought higher returns in these countries. Following the COVID-19 pandemic and its aftermath of high interest rates, capital outflows from developing countries again rose rapidly, putting additional pressure on financial systems already dealing with surging interest rates and tighter financing conditions. Overall FDI inflows into developing countries have stagnated since the years following the 2008 global financial crisis. Besides, while FDI flows have been typically more stable, they have tended to be highly concentrated in a few countries and sectors (UNCTAD 2024b).

Stagnating official development assistance

Official development assistance (ODA), typically a stable source of financing, plays an important role in

bridging the financing gap in low-income countries. However, ODA in the form of grants to developing countries have stagnated in the past decade while that in the form of loans has grown (UNCTAD 2024c). Furthermore, an increasing proportion of aid is now directed towards crisis response and humanitarian assistance rather than long-term development priorities. While the overall volume of multilateral contributions has risen between 2012 and 2022, they have rather stagnated if funds for the COVD-19 pandemic and the response to the war in Ukraine are excluded (OECD 2024a). At the same time, ODA is often inefficiently managed, leading, for example, to donor fragmentation, duplication of efforts and a misalignment of priorities between donors and recipients. Employment creation is often not an explicit goal pursued by donors, despite its critical role in fostering sustainable development. Furthermore, structural inequalities embedded in the global financial architecture often compel international FIs to impose market-based reforms as prerequisites for financial assistance, even though these frequently undermine socio-economic performance.

Global macroeconomic instability

Global macroeconomic developments (driven recently by crises, trade tensions, protectionism and geoeconomic fragmentation) have adverse spillover effects on the financing conditions faced by developing countries. These countries are often more vulnerable to external shocks due to their reliance on volatile commodity prices exports and international capital flows, limited fiscal space and weak social protection systems. Between the beginning of 2020 and the end of 2022, a period marked by uncertainty following the COVID-19 pandemic and the war in Ukraine, sovereign spreads in developing countries almost tripled (IMF 2023), greatly increasing their borrowing costs. In the short term and during periods of crises and uncertainty, external factors play a much larger role in determining sovereign spreads faced by developing countries than the macroeconomic fundamentals of these countries (Bellas et al. 2010).

At the same time, the focus of macroeconomic policies has remained narrow in modern economic thinking. These policies have typically been geared towards maintaining stability, whether in terms of prices or public finances, but it has become clear that maintaining stability alone is insufficient to support sustained and inclusive structural transformation and broad-based productive employment creation. The Great Recession and the COVID-19 pandemic and its aftermath have led to a reconsideration of macroeconomic policies, including greater appreciation of countercyclical fiscal and monetary policies in fighting recessions and of policy frameworks that support productive jobs, inequality and climate change. Indeed, in a time of increased disruption and income dispersion from digital transformation and climate change, maximizing the synergy between production, jobs and distribution within an economy needs to be a central priority of macroeconomic policy (Samans 2024). Embedding countercyclicality and resilience into macroeconomic policies could support developing countries to better withstand external shocks in order to ensure a conducive environment for mobilizing long-term public and private financing of structural transformation.

Climate change and environmental degradation

Climate change and biodiversity loss represent growing threats to the development prospects of many countries, particularly those that are highly vulnerable to natural disasters, such as small island developing states. The increasing frequency and severity of climate-related disasters – such as hurricanes, floods and droughts – can cause widespread damage to infrastructure, reduce agricultural productivity and displace peoples and workers. These disasters not only lead to immediate humanitarian crises but also impose long-term economic costs, diverting resources away from development projects towards recovery and reconstruction efforts. Developing countries not only experience disproportionately higher economic damages from natural disasters relative to their GDP compared to advanced economies – primarily due to their heightened vulnerability to such events – but they also have fewer resources for disaster preparedness and response (Bhattacharya et al. 2021).

Future prospects

Not only do financing gaps remain large but closing the gap has become more challenging as the current global macroeconomic context has become less favourable, particularly in the context of interest rates remaining higher for longer. Medium-term growth prospects have consistently been revised downward since the global financial crisis of 2008,

driven mainly by lower productivity growth rates (IMF 2024). Global growth between 2022 and 2030 is projected to fall to a three-decade low, while growth rates in developing countries are projected to average 4 per cent per year during this period compared to a rate of 6 per cent per year between 2000 and 2010 (Kose and Ohnsorge 2024). Furthermore, expectations of weaker growth could become self-fulfilling by deterring investment (IMF 2024). Investment rates have already fallen in the past two decades globally and continued weakening investment contributes to a less favourable macroeconomic environment. In developing countries, the growth in gross fixed capital formation between 2021 and 2023 averaged 4.1 per cent compared to an average rate of 8.1 per cent between 2000 and 2007 (UNIATF 2024). Repeated shocks and crises have increased uncertainty and discouraged firms' investments, while future profitability expectations by firms have also been lowered, notably as the cost of corporate debt has risen. While inflation slowed down in 2024 from its highs in 2022 – which has led to lower sovereign spreads –, financial conditions continue to remain tight for many developing countries, constraining their ability to finance development needs, including the multifaceted employment and labour market challenges.

3.3. The role of pro-employment budgeting and employment-related public expenditure reviews

Various policy options exist to address the financing gap while also addressing labour market challenges, which are often pervasive and widespread. These can include supporting formalization – which can support domestic resource mobilization – or recalibrating tax incentives (tax expenditures) by making them more conditional on specific outcomes, such as a certain number of jobs created. Public–private collaboration can also be instrumental for overcoming coordination failures related to financing. Often, multiple investments or actions must occur simultaneously for an investment or project to become viable over the long term. Yet, independent actors operating in their own self-interest often struggle to align these investments. Public–private alliances can support the coordination of financing flows, addressing market failures and de-risking investments. The active participation of employers' and workers' organizations in these public–private alliances, in particular, can be critical in ensuring national buy-in of policies and their financing strategies over the longer term. Public development banks are also vital in linking the short-term outlook of private FIs with the longer-term investment horizons required for development and sustained job creation. Public development banks can also stabilize critical investments and mitigate the impacts of external shocks by offering countercyclical lending during economic downturns. Nonetheless, a comprehensive discussion of all the different options is beyond the scope of this section.[35] Instead, this section focuses on the policy options of PEB, with a focus on employment-related public expenditure reviews, which aim to maximize impact without necessarily increasing expenditures. Improving the transparency, accountability and effectiveness of spending by aligning financial resources more closely with the priorities of productive job creation is just as essential as mobilizing additional resources.

3.3.1. Policies prioritize employment, but public budgets do not

Employment issues feature increasingly high in national agendas. As a response to increasingly complex employment challenges in a context of fast-changing future of work, a growing number of countries have adopted employment policies. A recent ILO review shows that only two countries had a stand-alone employment policy in 2002 against 77 in 2024 (and an additional 19 with a policy process under way) (d'Achon 2021; ILO 2024). In addition, an increasing number of countries have announced ambitious employment targets in their NDPs (Campbell, Egger and Ronnas, unpublished). Yet, designing policies and making employment announcements is only one part of the required effort. Budgets are an even clearer indicator of government commitment than policies. To translate

35 For a more comprehensive discussion, see the annual reports by the United Nations Inter-Agency Task Force on Financing for Development.

employment priorities into real changes requires reflecting the policy's objectives into budget allocations and related expenditures, as well as looking at how governments raise their budgets and the implications for employment.

Employment commitments often fail to be transposed into action because it is not made a priority in national budgets. The public budget is the main instrument through which governments can help address employment deficits, by maintaining a certain level of aggregate demand and by funding interventions that promote the creation of employment, improve its quality, and support transitions, including structural transformations. However, in practice, many commitments to employment have remained on paper because they do not receive the same attention as other economic and social objectives and remain insufficiently integrated into national budgets – in part because of the long-standing view of employment as a mere flip side of economic growth. Yet, this still seems to be the case when governments have adopted employment policies, have placed employment at the core of their NDPs or have set important employment targets; and even in cases when the impacts of fiscal policies on employment are discussed, the attention tends to focus on the level of expenditures and how they are financed. But the allocation of these expenditures across and within programmes – the focus of PEB – is also critical because different interventions are likely to have different impacts on employment outcomes. Employment-related public expenditure reviews conducted in various countries show that overall employment commitments are not matched with adequate budgets in terms of level, composition and efficiency resulting in insufficient operationalization of adopted employment policies. Therefore, further support is needed to ensure that employment priorities are linked to solid financing strategies.

3.3.2. Employment budgeting calls for a change of mindset

Translating employment policies in budgetary terms ("employment budgeting") is not an easy task, in particular in times of constrained fiscal space, as witnessed in the current poly-crisis context. As noted earlier, high inflation and weak economic growth, tightened monetary and financial conditions, and high debt burdens – along with the escalating climate emergency – are challenging the ability of

> Employment issues feature increasingly high in national agendas.

countries to effectively finance their policies and SDGs commitments.

A second challenge lies in the cross-cutting nature of employment. Ultimately, PEB is a strategy and a process with the aim of achieving employment objectives and ensuring that adopted employment policies and priorities are reflected in national budgets. An employment policy – in line with the Employment Policy Convention, 1964 (No. 122), is a public policy approach that addresses the threefold challenges of employment creation, access to employment and quality of jobs. As such, it encompasses a vast array of interventions – ranging from macroeconomic and sectoral policies to skills, labour market and governance policies – and various combinations of policy components. This multidimensional nature of employment policies has concrete implications when it comes to translating them into budgetary terms.

To showcase the multidimensional nature of employment policy, the International Labour Conference's third recurrent discussion on employment in 2022 (ILO 2022) provides a framework for identifying which programmes or expenditure types to include. It underscores the various elements relevant to employment creation, improving job quality and ensuring more inclusive employment outcomes. The elements include social protection systems and ALMPs. At the same time, it emphasizes the need for macroeconomic and fiscal policies, productive transformation, sectoral and regional policies, entrepreneurship and enterprise development, and human capital investments. This framework offers insights into how broad the fiscal effort can be regarding the creation of employment, improving its quality and securing its inclusiveness in a resilient and sustainable fashion. Bridging this framework in which policies depend on fiscal efforts requires some adaptation. Table 3.1 stylizes an employment policy framework and results from six employment budgeting reviews. For example, while macroeconomic policies – such as the management of interest rates or legislative reforms – may not require significant fiscal effort, their implementation can have significant fiscal impacts.

Table 3.1. Number of countries reporting employment-related actions and expenditures

	Creating employment	Improving the type of employment	More inclusive employment outcomes
Pro-employment macro policies			
Fiscal and monetary policy to maintain stability and create jobs	4	1	
Public expenditures to fund sectoral programmes for jobs	1	1	
Mainstream jobs, youth and gender in public budgets	2	1	1
Labour policies			
Labour institutions and social protection			
Improving labour regulations	2	2	1
Enforcing labour regulations		3	1
Working conditions		1	
Coverage of social insurance (pensions and healthcare)	2	2	
Coverage unemployment benefits		3	2
Social grant/basic income		1	1
Active labour market programmes			
Counselling			5
Intermediation			5
Job search assistance			5
Skills development (including on-the-job training)			6
Wage subsidies			2
Childcare			1
Interventions to facilitate migrations			4
Public works			2
Sectoral/regional			
Investments in strategic sectors/value chains			
General investment incentives	1	1	
Territorial development	3	1	2
Agriculture	4	1	1
Manufacturing	3	1	
Construction	3	1	
Tourism	3	1	
Transport	3	1	
Information and communication technologies	3	1	
Green energy	1	1	
Social, solidarity economy	4	2	

▶ **Table 3.1.** ***(continued)***

	Creating employment	Improving the type of employment	More inclusive employment outcomes
Support to MSMEs			
▶ Productivity and formalization	2	1	
▶ Access to finance	3	1	
▶ Grants/subsidies	1	1	
▶ Training and technical assistance	3	1	
▶ Access to markets, clusters and value chains	2	1	
▶ Simplification of registration procedures	4	1	
▶ Changes in taxes	1	1	
▶ Public procurement for MSMEs	3		
Entrepreneurship			
▶ Access to finance	3		2
▶ Grants/subsidies	3		2
▶ Training and technical assistance			1
▶ Access to markets, clusters and value chains	2		

Note: These results are based on a sample of six countries.

Source: d'Achon and Robalino (2023).

The table outlines the main areas related to macroeconomics, labour policies and sectoral or regional policies, highlighting expenditures and their connection to creating employment, improving its quality or reducing barriers to access. For instance, under labour institutions and social protection, five out of six reported countries implemented programmes providing coverage to unemployed persons, with three reporting improvements in employment quality and two indicating enhanced labour market inclusion. The table first underscores the need to go beyond viewing employment issues solely as labour market concerns. Notably, all countries in the sample reported actions under territorial development. This is significant because acting at the subnational or local level enables targeted efforts to address territorial asymmetries and local sectoral potential, demonstrating that employment opportunities are pivotal for fostering inclusion and improving quality of life. Second, most countries have some fort of expenditures related to prioritized sectors, with a view to moving towards productive transformation. Furthermore, meso- and micro-level triggers and bottlenecks, along with their systemic effects, are more tangible and better understood at this level.

The important point is not whether an initiative is explicitly labelled or categorized as "employment" and under the responsibility of ministries in charge of employment, but whether fiscal expenditures, tools and materials are formulated with an eye to promoting employment. The proportion of public expenditure dedicated to explicit employment objectives is limited. Yet, the share of expenditures that can potentially contribute to employment is much larger because it encompasses spending across many or most areas of national budgets (d'Achon and Robalino 2023). For example, infrastructure, industry, trade, education or healthcare policies and budgets have a significant impact on labour markets outcomes but are usually not considered from an employment perspective.

PEB is based on the premise that budgets are not employment-neutral and that virtually all expenditures can positively or negatively impact labour market outcomes. In practice, this means that PEB is about revealing the different impacts of expenditure and revenue decisions on employment.

Pro-employment budgeting is about revealing the different impacts of expenditure and revenue decisions on employment.

In parallel, this also means that the budgetary implications for, and impacts on, employment should be considered when preparing the budget. Concretely, translating employment policies into budgetary terms involves using the tools, techniques and procedures of the budget cycle in a systematic way to promote employment – hence the name PEB.

The global environment provides both challenges and opportunities for PEB. First, the global financial crisis marked a shift towards expenditures to promote employment and inclusive growth. The debate is about the fact that a budget can simultaneously support economic growth but be detrimental to employment creation – or can achieve equilibrium between revenues and expenditure, but at the detriment of employment outcomes.

Second, the methodologies have evolved from input-based budgeting to results-based budgeting (RBB) and increasingly towards strategic budgeting in many parts of the world. While traditional budgeting classifies expenditures by types of inputs (such as salaries or equipment), RBB (or performance-based budgeting) gives outcomes and performance central attention in the budgeting process – a crucial element for implementing PEB approaches. On the other hand, strategic budgeting focuses on integrating budgeting and planning. It emphasizes multi-year planning and quantified results to achieve specific goals through the budgeting process. The focus here is less about performance and more on whether resources are being allocated to the key priorities – which is another important requirement for employment budgeting.

Third, PEB is gaining interest in the ongoing global policy debates and initiatives on financing for development. Following the COVID-19 pandemic and successive shocks, the acknowledgment that that national budgets have an enormous impact on prospects for achieving the SDGs, including SDG 8, has become more widespread. Yet, while development needs are growing, development financing is not keeping pace as noted earlier in this chapter. In this context, PEB provides interesting potential to better align financing flows with SDG 8 and national priorities, as set in nationally adopted employment policies.

As fiscal space is increasingly constrained and governments have important trade-offs to make, PEB is indeed special as it goes beyond identifying new sources of funding to also extracting efficiencies from existing sources. Indeed, the primary objective of PEB is not about increasing expenditures to create employment, but primarily about how to do better in promoting employment with existing resources ("budget-neutral shifts"), while also allowing for options for potential increases of overall employment-related budget. The point is that the budget must reflect the adopted policies. To do that, reallocations that improve allocative efficiency are also necessary, which is particularly relevant in times of constrained fiscal space. In addition, financing employment goals can itself support countries to enlarge their fiscal space and finance other key priorities, such as social protection. The growth of more and better jobs expands households' primary source of finance, their labour income, which in turns expands the tax base and domestic resource mobilization. Workers are also consumers, and as they have more disposable income, their demand for goods and services increases. This can stimulate firms to hire and invest, which in turn feeds back into faster creation of decent and productive employment opportunities.

Finally, following the call of the Addis Ababa Action Agenda many countries have embarked on developing an INFF to better align financing flows with SDGs. In that context, new tools and methodologies need to be developed to enhance and track the employment dimension of INFFs, identify potential gaps and inefficiencies, and make necessary adjustments in view of achieving SDG 8. In that context, PEB can help countries to prioritize public support across the many different types of interventions, with varying degrees of SDG 8 impact.

3.3.3. Where and how to influence the budget

There are a number of entry points for employment budgeting along the planning and budgeting cycle (see figure 3.2). Some of them are described below, with a specific focus on ERPEs.

A clear and suitable employment policy framework is an important condition for PEB

An active approach to policy planning which takes employment as a key variable is the very first step towards PEB. This can take different forms depending on country contexts: integrating employment as an explicit objective of the national development plan and/or adopting a stand-alone employment policy. Irrespective of the form, a pre-condition for having a PEB is designing an employment policy that is line with results-based principles and requirement – that is, which sets a vision and objectives for employment, clearly identifies priorities, is based on sound information, focuses on measurable results with quantitative targets for different employment outcomes and estimates in terms of expected costs.

A development model that acknowledges the centrality of employment and sets specific employment targets

In the majority of countries, NDPs guide the formulation of the national budget by the different line ministries. Concretely, this means that ministries negotiate funds based on different criteria – including how their demand is consistent and aligned with national priorities as defined in the NDP. Over the last decades, most NDPs have recognized the importance of employment in the overall development agenda. Yet, while the majority of these plans address labour supply challenges well, the link between structural and sectoral policies and employment outcomes is often treated in broad terms and lacks detailed operational focus. In addition, most NDPs seem to make general statements or set broad targets about increasing employment or reducing unemployment and informality, but they seldom set specific performance indicators and targets that could then be implemented by different line ministries and local governments (Campbell, Egger and Ronnas, unpublished; d'Achon 2021; d'Achon and Robalino 2023). Within this policy framework most line ministries do not have incentives to design policies and budgets with specific employment objectives in mind. Hence, the necessity of integrating employment as an explicit and central objective of NDPs along with specific targets for improving employment outcomes for different line ministries.

Setting in place a pro-employment fiscal framework

In general, the preparation of national budgets is based on macroeconomic forecasts, which provide the budget ceilings specified in medium-term expenditure frameworks, and on national priorities as defined in the national development framework and sectoral policies. These frameworks are important entry points for employment budgeting, as discussed in Chapter 2.

During **budget formulation**, employment responsiveness can be highlighted in many different forms. Entry points at this stage of the

▶ **Figure 3.2. Entry points for employment budgeting in the planning and budgeting cycle**

There is a need to bolster what fiscal expenditures track as results.

budget process can be to prepare employment budget statements or to include requirements in budget call circulars or budget guidelines. Budget call circulars can be made more employment-responsive by stating explicitly that employment should be reflected in the submissions and will be considered an important criterion during negotiations. This can create an incentive for agencies to budget in an employment-responsive way. Another way that the circulars can be improved from an employment perspective is to require that employment-related indicators be included wherever relevant.

An employment budget statement could be described as an employment-specific document produced by a government agency to show what its programmes and budgets are doing with respect of employment. The budget statements can either be 1) internal government documents that are meant to inform budget prioritization; 2) accountability documents prepared after government agencies have completed the process of drawing up the budget and allocating resources to different programmes in response to the annual call circular; or 3) both. Section 3.3.4 presents some examples on how countries have implemented such approaches.

Finally, for **evaluation and monitoring**, reporting systems need to include specific employment indicators which can be easily monitored, especially in the context of authorizing the release of the next tranche of funds. At this stage, public ERs and EmpIAs are also important tools to assess the impact of the budget on employment and produce evidence to inform the subsequent budget. EmpIAs are discussed in Chapter 5, while ERPEs are presented in more details below.

3.3.4. Employment-related public expenditure reviews within functional expenditure frameworks

By examining how resource usage is made accountable to employment outcomes across sectors such as education, infrastructure and healthcare, PEB aims to improve the effectiveness of public spending and revenue in addressing employment goals, particularly in developing economies. Either by varying total revenue or expenditure, or securing financial expenditure – which contributes meaningfully to job creation and improved employment quality optimization –, PEB aims to have employment as one of its purposes. In this context, it is necessary to take a deeper dive into how government spending, across various functional areas, can be systematically analysed and adjusted to better align with national employment objectives. It builds on the foundations stated above to achieve sustainable, pro-employment fiscal expenditure that aligns with broader national and global development agendas on employment.

The ERPE account and its eventual reviews – collectively referred to as ERPE – are one of the different tools that can be used to gradually implement a pro-employment budget. ERPE serves as a classification tool to identify and categorize expenditures as employment-related, forming just one component of the larger PEB framework. For example, linking employment-related expenditures to actual results requires robust administrative records. Moreover, as ERPE evolves into an ongoing exercise, it necessitates the development of budget guidelines that incorporate employment requirements – such as integrating employment key performance indicators (KPIs) into sectoral budgets and other related measures, and thus evolving into a PEB.

Public ERs represent a powerful instrument for addressing economic and social challenges. For decades, categorization by functions has provided a structured framework for organizing public budgets, ensuring clarity, accountability and comparability. Established methodologies, such as those of the IMF (IMF 2014), offer guidance for grouping expenditures into standard functions like education, healthcare and social protection. These categorizations help governments allocate resources strategically, monitor performance and align budgets with national priorities.

However, as multiple priorities emerge, there is a need to bolster what fiscal expenditures track as results. As stated earlier, national and international references to employment commitments abound, while performance in achieving them lag, including progress on SDG 8 (ILO 2019). Functional expenditure classifications have demonstrated their

adaptability, with successful extensions including gender-sensitive budgeting and poverty-focused analyses. These innovations have not displaced traditional classifications but rather enhanced their utility by embedding targeted objectives into existing systems. They illustrate how related tools – such as satellite accounts, including employment satellite accounts – can coexist harmoniously with functional classifications, offering additional layers of analysis that respond to pressing societal needs.

> Enhanced tracking provides policymakers with the data necessary to design targeted, evidence-based interventions.

Expenditure tracking is often confined to active or passive labour market measures, overlooking the broader scope of employment-related interventions, such as sectoral strategies and regional development strategies. Expanding expenditure tracking to incorporate these areas within public financial management would provide authorities with a more nuanced understanding of how policy expenditures on sector promotion and regional development translate into employment outcomes. In turn, by comparing actual allocations against policy intentions and tangible conditions, governments can identify opportunities to prioritize expenditures that are more effectively aligned with employment objectives. This would enable employment-related goals to be embedded within fiscal planning processes, ensuring that employment objectives are pursued not as isolated goals but as integral components of structural transformation strategies. The ability to systematically link public spending with outcomes would also improve policy adaptability, making fiscal frameworks more resilient to structural economic shifts.

Enhanced tracking also provides policymakers with the data necessary to design targeted, evidence-based interventions. Through its results-based nature connecting spending to outcomes, policymakers can identify gaps in labour market access or workforce inclusion and adjust strategies to address these disparities effectively. For example, a social protection programme might reduce income volatility, but its impact on formal employment transitions can only be understood through a cross-cutting lens. Similarly, investments in education may enhance labour productivity. Yet, their employment outcomes often depend on complementary infrastructure or industrial policies, particularly in the long term. As such, careful consideration is required when selecting the elements to be included in ERPE reviews.

ERPE reviews address these challenges by functioning as an analytical extension of functional expenditure frameworks, specifically designed to address the cross-cutting nature of employment objectives. Employment outcomes are shaped by expenditures across a range of functions – spanning education, healthcare, social protection, infrastructure and beyond. By systematically evaluating these interconnections, ERPEs reveal how government spending converges to influence employment dynamics and exposes opportunities for greater allocative efficiency.

These reviews help to alleviate the limitations of traditional frameworks, which often analyse expenditures in silos, overlooking the interconnected nature of employment across fiscal policies. Through this complementary approach, ERPEs not only enhance the accountability of government spending but also ensure that employment remains a strategic priority in national development. By linking expenditure to employment outcomes, ERPEs align closely with government priorities of economic stability, equity and inclusivity. Ultimately, ERPEs enrich public financial management by ensuring that employment considerations are systematically embedded in resource allocation and impact assessment, ultimately enhancing the overall effectiveness of public spending.

3.3.5. Thematic areas of employment-related public expenditure reviews

Tracking employment-related expenditures expands earlier efforts to evaluate labour-related public spending. For example, they build on the OECD's indicators on public spending on labour markets (OECD 2024b) or in labour market expenditure reviews by international FIs. For example, estimations of expenditures in Latin America and

the Caribbean focused on schemes such as early retirement, protected employment, income support for the unemployed, labour incentives, ALMPs, labour mediation and direct employment creation (public employment programmes) (Tromben, Villanueva and Caillaux 2023).

While these methods offer much value, they are predominantly focused on labour market–specific measures. To address the multidimensional nature of employment, it is necessary to broaden the scope to include demand-side dynamics and cross-sectoral impacts. The analytical need to go beyond these areas is recognized under various efforts, such as the ILO,[36] the World Bank, and other think tanks and bilateral development cooperation agencies (Hempel 2022; Merotto 2020; Scheja, Verick and Gardiner 2023). This expansion allows ERPEs to provide a more integrated and holistic perspective on employment-related expenditures, ensuring that public resources address both immediate labour market challenges and long-term development objectives. A number of thematic areas are considered below, including those that can enhance economic activity to be more employment friendly and increasing labour demand.

Social protection systems: Anchoring stability and labour market inclusion

Social protection systems form the backbone of equitable and resilient labour markets. Expenditures on unemployment insurance, social assistance programmes and contributory social security schemes play a dual role: they protect against risks and provide critical income support during economic downturns while incentivizing formal employment transitions.

As automatic stabilizers, social protection expenditures sustain household consumption, mitigating the depth of recessions and reducing the need for reactive fiscal measures. By smoothing economic cycles, these investments contribute to more predictable fiscal planning and recovery. At the same time, linking social benefits to formal employment helps broaden the tax base, enhancing compliance with labour regulations and supporting fiscal sustainability. ERPEs assess the efficiency and equity of these systems, identifying gaps in coverage and opportunities for strengthening their role in promoting labour market inclusion.

Active labour market programmes: Facilitating workforce transitions

ALMPs – including skills training, wage subsidies, public works and employment services – are pivotal for addressing labour market frictions and equipping workers to navigate economic transitions. These programmes reduce mismatches between workforce skills and labour market demand, facilitating smoother transitions for jobseekers.

Here, tracking expenditures and their impacts can offer valuable support. For instance, assessing the long-term productivity gains from vocational training or the cost-effectiveness of wage subsidies enables policymakers to optimize resource allocation. This evidence-based approach ensures that ALMPs enhance employability, support workforce adaptability and contribute to broader economic dynamism.

Sectoral and regional policies: Fostering economic diversification

Sectoral and regional policies address structural challenges by targeting investments in high-potential industries and underserved areas. Public spending on renewable energy, digital technology, advanced manufacturing and regional development initiatives can generate significant employment multipliers, driving both localized and systemic growth (Salazar-Xirinachs, Nübler and Kozul-Wright 2014).

As such, it is necessary to analyse the alignment of these expenditures with employment goals, revealing how strategic investments can catalyse private sector innovation and job creation. Regional policies can also play a critical role in reducing geographic labour market disparities, stabilizing regional economies and alleviating pressure on urban infrastructure. By providing evidence of the long-term impacts of these policies, tracking these expenditures help policymakers (re)allocate interventions that support regional or local economic diversification and resilience.

MSME development: Driving job creation and formalization

MSMEs are key drivers of employment, particularly in labour-intensive and emerging industries.

36 The ILO organized an online event on 22 June 2022, entitled "Transición digital, cambio tecnológico y políticas de desarrollo productivo en ALC: Desafíos y oportunidades", in parallel to the OECD's Fourth Ministerial Meeting on Productivity.

Public support for MSMEs often includes access to finance, business development services and market facilitation. These interventions help MSMEs overcome barriers to growth and formalization, expanding their role in job creation and economic stability.

As such, tracking expenditures on measures that foster entrepreneurship, enhance entrepreneurship skills and facilitate access to new markets is important. The focus on the productivity angle and registry aspects of formalization is particularly critical, as it not only broadens the fiscal base but also strengthens regulatory compliance and worker protections.

Investments in people's capabilities: Preparing the workforce for the future

Expenditures on education and vocational training are foundational to enhancing labour productivity and equipping workers with the skills needed for emerging industries. Human capital investments reduce skills mismatches, improve employability and drive economic growth by aligning workforce capabilities with market demands.

Evaluating the allocation efficiency and funding outcomes of human capital expenditures is important in ensuring that public spending is strategically targeted to maximize long-term returns. For example, investments in sector-specific training programmes may yield significant benefits in high-demand fields like green energy or digital technology. By linking educational outcomes with labour market requirements, ERPE reviews help governments prepare the workforce for future economic transitions while promoting equitable access to opportunities.

With this taxonomy and examples highlighting the importance of a number of thematic areas, section 3.3.6 explores expenditure areas are vis-à-vis policy priorities.

3.3.6. Aligning employment-related public expenditure reviews with broader government priorities

ERPE reviews provide a clearer picture of employment objectives versus fiscal priorities, measuring the degree to which public resources

> Regional policies can play a critical role in reducing geographic labour market disparities, stabilizing regional economies and alleviating pressure on urban infrastructure.

are deployed effectively to support employment outcomes and economic stability. Such reviews can support the evaluation in which public expenditures support strategic government objectives – such as economic resilience, equity and inclusivity – with explicit links to employment. Through systematic analysis, evidence-based insights into resource size and allocative efficiency can be enhanced.

While ERPE reviews basically rely on the availability of data sources akin to the COFOG, which are sometimes not available. Still, as in the case of Tunisia, ERPE were analysed using a meticulous manual review of detailed budget documents from key line ministries. This process identified specific programmes and expenditures linked to employment outcomes, such as support for MSMEs, vocational training programmes and agricultural extension services.

To complement the document review, surveys and interviews with officials from relevant ministries, such as agriculture and industry, where also undertaken. The data were then cross-referenced with the objectives of Tunisia's national employment policy to ensure alignment. While more time-intensive, such an approach enabled the assessment of whether resources were allocated in a way that supported national priorities on employment, while laying the groundwork for systematically tracking employment-related expenditures on an ongoing basis.

On the other hand, experiences from the country demonstrate how access to COFOG can streamline the analysis of ERPEs. In Ecuador, having access to COFOG data allowed the rapid development of an "employment budget framework", which effectively categorized expenditures across various government programmes based on a taxonomy similar to table 3.1.

Another issue is how to address the intent of employment-related expenditures to guide employment policy. Even in the absence of a formal national employment policy framework, ERPE reviews can still be conducted effectively by 1) comparing expenditures to an internationally available stylized framework, and 2) evaluating them against an assessment of a country's employment situation, such as an employment diagnostic. This approach compensates for the lack of policy structure by providing a systematically organized catalogue of interventions, categorized by their likely effect on generating employment, improving its quality or enhancing inclusion.

This catalogue serves as a provisional framework, helping to structure the analysis of public expenditures, and eventually feeds into the development of a potential employment policy. For example, interventions targeting skills development, MSME support or public works can be assessed for their relevance and adequacy based on the diagnostic findings. Additionally, this approach provides a foundation for engaging stakeholders and advocating for the development of a formal employment policy that reflects the identified priorities and gaps. It also enhances accountability vis-à-vis the current situation.

3.3.7. Promoting coherence across policy areas

Employment-related expenditures intersect with multiple policy domains, including healthcare, education, social protection, infrastructure and industrial policy. As such, these exercises emphasize the importance of cross-sectoral coherence, ensuring that employment considerations are systematically integrated into public expenditure management across government sectors. This integration reduces duplication, enhances synergies and maximizes the impact of public spending.

For instance, investments in education contribute to labour productivity, but their employment outcomes often depend on complementary spending in infrastructure and industrial policies. A caveat needs to be stated that, in some areas, it is necessary to consider which employment effects to consider. In the case of infrastructure, for example, it might be more important to account for the long-term induced effect estimates than the direct effects of road construction, such as local dynamics from feeder roads in Rwanda (Game and Kang 2023).

> ERPE reviews support the development of integrated policy frameworks by highlighting how employment-related expenditures align with broader fiscal and economic strategies.

The reviews also provide insights into how employment-related spending interacts with other national priorities, such as education, healthcare and housing. By highlighting these connections, the integration of employment-related expenditure budget with other national priorities supports the development of integrated policy frameworks that align employment objectives with fiscal and economic strategies.

The intent of tracking employment-related expenditures goes beyond simple expenditure tracking: employing analytical methods to evaluate the effectiveness and efficiency of public spending can lead to improvements in RBB. For example, identifying allocative efficiencies – such as when priority programmes like wage subsidies or social protection schemes are underfunded or misaligned with employment objectives – can reveal critical gaps. In Costa Rica, sectoral expenditures have focused heavily on transport and general investment incentives, with manufacturing receiving significant attention. Despite fiscal constraints, Costa Rica allocated around 4.14 per cent of its GDP to sectoral programmes, reflecting a commitment to enhancing economic and labour market outcomes. In Namibia, public expenditure analysis uses administrative data, particularly from its integrated employment information system, to manage jobseeker registrations and evaluate public employment services. Despite the availability of detailed data, coverage rates and placement outcomes reveal challenges in allocative efficiency. Only 3 per cent of the unemployed population engages with public employment services, with fewer than 5 per cent of those beneficiaries securing jobs within a year. These findings underscore inefficiencies in resource allocation within ALMPs and underscores the need

for more strategic resource allocation (d'Achon and Robalino 2023). In this context, the notion of "more with less" may not always apply, sometimes, "more is more" is necessary.

3.4. Country examples

As mentioned above, an increasing number of countries have deepened their commitment to employment through the development of dedicated employment policies and mainstreaming employment in their NDPs. A recent review shows that more prominence is being given to fiscal policy in nationally adopted employment policies – with around 60 per cent of policies acknowledging that fiscal policies can play an important role in achieving employment priorities. In contrast, employment policies make relatively little reference to monetary policies (only 28 per cent), reflecting a reduced focus on monetary policy as the main instrument for economic growth in developing countries.

As noted earlier, the focus on employment policies is not only about creating fiscal space for employment, but also optimizing the use of available resources to best achieve employment objectives and moving towards PEB, including through ERPE reviews (for example, national employment policies for Mali in 2014, Cameroon in 2017 and Zambia in 2019). In a context where fiscal space is increasingly constrained – in particular for low-income countries, which face critical constraints including very high levels of unsatisfied basic needs and low revenue to GDP ratios –, the composition and efficiency of public spending is likely to become even more critical in the future.

Some countries have integrated PEB in their employment promotion laws – such as China and the Republic of Korea – hence creating an even stronger incentive than policies. In China, the employment budget is guaranteed by the 2008 Employment Promotion Law, which states that each level of government must allocate appropriate funds to achieve the goals set by the policy. At the provincial level, the law stipulates that a certain percentage of the local annual budget must be allocated to employment creation. More precisely, it indicates that "the State implements the fiscal policies which are favourable for the promotion of employment, increases the input of funds and improves the employment environment in order to increase employment. People's governments at or above the county level shall, in light of the employment situation and the goal set for the work concerning employment, utilize appropriate resources from their budget special funds for employment promotion". An interesting feature of the Chinese experience is that the size and allocation of the employment budget is closely linked with employment targets and employment policy results. The total annual employment budget is determined based on the previous year's level of the following four indicators: number of new jobs created, number of re-employed persons, number of re-employed disadvantaged persons and unemployment rate. The allocation of resources from central to local government is based on the performance of the employment policy implementation. Local governments which perform well in terms of achieving their employment targets get more budget support the following year.

Employment budgeting implies working with a wide range of stakeholders. For cooperation to work, it is necessary to identify and distribute responsibilities among stakeholders. In China, each actor has a clear role. The employment, finance and statistics authorities and the National Development and Reform Commission work together to set the employment targets. The employment and finance authorities discuss the level of budget allocations needed to reach these targets. The Ministry of Finance leads the monitoring and evaluation of the use of funds, while all the ministries concerned use the budget to implement employment policies.

Between 2008 and 2022, the Government of the Republic of Korea embraced a new paradigm shift towards placing employment at the core of all public policies and budgets. This has been progressively implemented and institutionalized through a series of concrete legal, institutional and

An interesting feature of the Chinese experience is that the size and allocation of the employment budget is closely linked with employment targets and employment policy results.

> Some countries are implementing some elements of PEB in view of moving progressively towards fuller adoption process.

policy reforms – facilitated by strong leadership and engagement from the successive presidents. First, the government conducted legal reforms. The Basic Employment Policy Act was passed in 2009, requiring the production of EmpIAs of public policies – both at the national and local levels. In 2010, the government developed the 2020 National Employment Strategy and, in 2012, it introduced the Jobs Budget, in which employment was placed as the top priority of national budgeting. The government also carried out important institutional reforms, including repositioning the Ministry of Labour and providing it with a legal mandate and the authority to coordinate the employment-related policies of other sectoral ministries and departments. In addition, an Employment Impact Evaluation Centre was established for developing methodologies and assessing the employment effects of central and local policies not just under the responsibility of the ministry in charge of employment, but all government policies – as well as laws, investments or regulations that have an impact on employment. As in the case of China, the Republic of Korea created incentives to get the buy-in of sectoral ministries and ensure that the findings of the evaluation then feed into future policies and budget allocations. All institutions were required to integrate the findings of the evaluation in their action plans within 30 days after the request from the Ministry of Employment and Labour and to submit the results of implementation to it. These then fed into the budget allocation process. Positive reporting on the inclusion of employment criteria into policies and action plans led to better financial allocations or the reconduction of similar budgets for the ministry concerned, while others that showed poor results have been reduced.

As the Korean experience shows, PEB does not happen in one day. It is a lengthy and iterative process, which involves many elements, from developing solid methodologies to strong political will, as well as effective institutions and systems to translate commitments into concrete results. As of today, not many countries have implemented such a comprehensive approach, but some countries are implementing some elements of it in view of moving progressively towards a fuller process. For example, over the last years, a number of countries – such as Costa Rica, Ecuador, Guatemala, Mozambique, Namibia, Tajikistan, Tunisia and Uzbekistan – have implemented, or are in the process of conducting, an ERPE review.

In Ecuador, the Ministry of Finance (MEF) has begun expenditure tracking on employment to size the overall fiscal effort broken down by components, and address the link with employment outcomes. Notably, the MEF is in the process of creating an employment-related budget, which leads the monitoring and evaluation of employment impacts from public expenditures. This aligns with efforts to address disparities across sectors and regions. While the MEF does not yet employ incentive mechanisms (like performance-based allocations) to reward ministries or regions achieving employment goals, its use of expenditure alignment highlights the need for collaboration with various instances and ensures that fiscal policies better reflect the country's development objectives, including those related to employment. As a first step, the budget for 2018–22 is being reviewed and coded to assess the overall effort and its relevance to the current labour market outlook. Furthermore, the ministry is intent on creating a more permanent way to keep tracking expenditures on employment.

In Namibia, following the development of an ERPE review, the government developed a pro-employment and gender-responsive budgeting (PEGRB) toolkit for mainstreaming employment and gender in national planning, budget programming, and monitoring and evaluation systems. PEB is a new approach in Namibia; stakeholders at all levels must be equipped with clear instructions and tools to enable them to deliver on the new requirements. The PEGRB toolkit is targeted at various stakeholders, including the Ministry of Finance and the technical teams in charge of preparing the budget in the various line ministries, social partners and parliament, which all have a role to play in shaping and monitoring the national budget. It aims at creating awareness about the importance of having a pro-employment budget and providing concrete tools and methodologies to help them introduce the reforms that are needed. The toolkit

provides advice on how to formulate an RBB with a focus on employment and gender, and presents the main institutional arrangements (including the roles of the ministries of labour, gender and finance, the National Planning Commission and social partners) and operational tools needed to implement a PEGRB and affect the budget formulation, execution and evaluation phases. For example, it outlines the types of performance indicators that can be considered to track outputs and outcomes for different types of interventions. It also presents different tools to cost interventions and assess, ex ante, their potential impact on these outputs and outcomes.

Following the toolkit recommendations, the 2023–24 budget circular has been revised to instruct all government agencies to budget in a gender-responsive way. It requires that implementing agencies: 1) describe the gender issues that the expenditure aims to address; 2) describe how the activities will address the gender issues given the amount of the allocation; and 3) specify indicators and targets that will measure performance in terms of gender. Discussions are under way at the time of writing to also include employment requirements so as to have a full pro-employment and gender-responsive budget.

3.5. Conclusion

Developing countries face pressing financing gaps that pose significant barriers to achieving sustainable development and productive structural transformation and to addressing persistent labour market challenges. Mobilizing additional resources is essential and relevant strategies exist, such as fostering public–private collaboration to coordinate financing flows, address market failures and de-risk investments. The adoption of macroeconomic policy frameworks that balance traditional stabilization objectives with the need to support long-term financing and investments in dynamic, high-growth sectors is another approach.

At the same time, enhancing the effectiveness of spending by better aligning financial resources to the priorities of productive job creation and transformation are also critical. In this context, PEB provides a structured framework to embed employment outcomes into fiscal strategies, ensuring that the public budget is more systematically aligned with employment goals. In other words, PEB supports the strategic reallocation of fiscal resources toward interventions that demonstrate clear employment outcomes. By linking budgets to measurable labour market outcomes, PEB enhances transparency and provides governments with tools to track and evaluate the effectiveness of their budgets and, in turn, create clearer evidence for resource gaps.

To enhance the alignment of public expenditures with employment objectives, governments need to channel resources into higher-productivity sectors with strong employment potential, prioritizing investments that simultaneously enhance economic diversification and labour absorption. Cross-sectoral policy alignment is necessary to ensure fiscal efforts in areas like infrastructure, education and healthcare contribute to employment objectives. This requires integrating labour market priorities into broader fiscal planning. A caveat is that, while allocative efficiency could be promoted, the overall level (income and expenditure) also needs to be assessed.

However, PEB is still an emerging approach that enhances the need for some prerequisites that are not always present at the country level, starting with a development model which acknowledges the centrality of employment as well as a pro-employment macroeconomic and fiscal framework that sets specific employment targets. Along with employment KPIs, an employment policy that sets the vision and objectives for employment provides an important basis to guide ministries of finance on how to improve efficiency in the level and allocation of employment-related expenditures. Hence, the objective of PEB is to reflect informed policy decisions on measures that will promote employment into budget allocations.

Another important challenge is the lack of RBB frameworks that incorporate employment KPIs and robust labour market systems, which are needed to track outputs and outcomes for different types of programmes across different ministries. This hinders the ability to track how budgets translate into employment outcomes, particularly in informal economies or sectors with high fiscal opportunity costs. Without the mechanism to produce, collect and report information on the employment-related indicators that inform policy and budget formulation (upstream), and monitor policy and budget implementation (downstream), it is not possible to implement a PEB approach. In this context, administrative data are particularly important (if not more than survey data): as governments move to

RBB, administrative data are needed for monitoring the "outputs". What is needed is reliable data on what is "produced" by key programmes or activities.

In addition, as PEB is cross-cutting, it requires a whole-of-society approach and, therefore, a robust institutional framework to ensure that all stakeholders are committed to and equipped with the necessary tools to deliver on its new requirements. Employers' and workers' organizations also have a key role to play in relation to PEB – as experts, advocates, monitors, practitioners and partners.

PEB implementation does not occur in one day at the country level and the process needs to be iterative and implemented gradually. As mentioned above, employment objectives relate not only to the quantity of jobs created, but also to their quality and inclusiveness, though these dimensions are difficult to track and assess. One pragmatic approach stated above is creating a codification of expenditures by functions related to employment, summarized as ERPE. Another pragmatic approach would be to start with simple indicators, such as the number of people employed or jobs created through the national budget. However, these may not be the best indicators in countries with a relatively low rate of unemployment but a large number of employed people who are poor and in unprotected jobs. Over time, as institutional capacity gradually grows, PEB can evolve to include more sophisticated dimensions, such as work quality and inclusiveness, ultimately progressing toward a "decent work" budgeting model.

What the work on PEB in general (and ERPE reviews as specific tools) has shown is that it can take many forms and include:

- integrating employment sustainability indicators into PEB frameworks;
- focusing on resilient and sustainable job creation;
- expanding ERPE review methodologies to include below-the-line measures (like tax incentives) to fully capture fiscal impacts on employment and address opportunity costs;
- addressing the challenges of tracking employment outcomes in specific sectors, such as transport, energy and infrastructure; and
- distinguishing between immediate (direct/indirect) and long-term (induced) employment effects.

Furthermore, ERPE reviews show that the slow progress in moving from low- to high-productivity sectors is linked to underinvestment in areas with high potential for labour demand. This is compounded by weak fiscal frameworks that fail to address demand-side labour issues effectively.

Finally, the main finding of this discussion on financing pro-employment frameworks is that governments need to enhance their commitment to channelling resources into labour demand stimulus – and specifically into higher-productivity sectors with strong employment potential – by prioritizing investments that simultaneously enhance economic diversification and labour absorption. To the degree that the fiscal effort supports the transition towards more productive sectors – while generating more quality employment and securing inclusiveness –, it also ensures impacts on the level of formality (productive, fiscal or administrative).

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Chapter

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4

Assessing the economic and social dimensions of policies: Some applications of the structural model for sustainable development

Xiao Jiang and Massimiliano La Marca

4.1. Introduction

Policymakers, especially in developing countries, face the complex challenge of designing interventions that address environmental, social and economic issues, while navigating global and national-level policy constraints. A comprehensive understanding of the joint impact of external factors and policy decisions on productive sectors and socio-economic groups is now essential for effective policy formulation aimed at sustainable development, DW and social justice.

The ILO's SMSD is an analytical tool that analyses the macroeconomic and sectoral outcomes of policies, providing insights on how policies affect productive activities and socio-economic groups. The core of the SMSD is a sectoral disaggregated, economy-wide model, which captures key economic relationships between households, enterprises and government institutions. The model can simulate scenarios – such as targeted sectoral investments – and broader policy interventions to evaluate their short- and long-term impact on employment, income distribution and other socio-economic dimensions. The flexibility of its modelling framework allows it to be adapted to specific country contexts and tailored to different policy objectives, making it a valuable tool for evaluating complex, integrated policies across diverse socio-economic settings.[37]

This chapter explores the application of the SMSD in three policy contexts, highlighting how it can be used to assess the impact of policy interventions in different economic environments – ranging from mining expansion in Namibia to energy transition in Bosnia and Herzegovina and investment operations in Senegal's agricultural and transport sectors.

4.2. The social accounting matrix and core model

The SMSD is based on a model rooted in the "structuralist" tradition.[38] This is characterized by the role given to the existing structure of the economy, its institutions, the socio-economic actors and their economic relationships. Such an approach allows the assessment of policy interventions as they propagate throughout the entire economy, represented by a system of interlinked socio-economic groups whose interaction is shaped by persistent institutional and economic structures.

> A comprehensive understanding of the impact of external factors and policy decisions is now essential for effective policy formulation aimed at sustainable development, decent work and social justice.

For this reason, the SMSD builds on the accounting relations of a SAM, which is a comprehensive representation of the economic transactions that occur within an economy between activities, actors and institutions. SAMs provide the necessary data to calibrate the model, ensuring that fundamental economic relationships are accounted for and that policy simulations reflect the actual structure of the economy. While SAMs capture economic transactions at a given point in time, the model generates counterfactuals by postulating adjustment mechanisms and the behaviour of economic actors – for example households, firms and governments – to reflect how they interact in response to policy interventions and external shocks.

To capture a wide range of relevant socio-economic relations, the SMSD uses SAMs that include the full sequence of national accounts:

- Goods and services
- Production
- Generation of income
- Allocation of primary income
- Secondary distribution of income
- Use of disposable income

37 A technical description paper of the SMSD can be found in La Marca and Jiang (2023) and it is available upon request.

38 See Taylor (1983, 1991, 2004) for a discussion on structuralist macroeconomics.

- Capital
- Gross fixed capital formation (GFCF)
- Financial
- Current transaction of the rest of the world (ROW)
- Capital transaction of the rest of the world

Table 4.1 shows the accounting structure and classification of the *aggregated* 2019 SAM for Namibia and its full sequence of national accounts.[39] Each row and corresponding column of the SAM represents a set of national account.

The full SAM typically used for the SMSD includes breakdowns of employees by occupation, of employed persons by gender and formality status, of households by income quintile, rural–urban status, of economic activities by industry and, possibly, whether they are formal/informal or their environmental sectors. Hence, each account group is associated with a classification. For instance, the first column and row indicate the name of the accounts (for example "Goods and Services" or "Production"), while the second ones indicate the classification used in that specific account (for example *Products* or *Industries*, respectively). The products' classification includes all goods and services used in the economy. The industries' classification includes all the activities in the production boundary in the system of national accounts. Rows represent "incomings" (or "receipts"), while columns represent "outgoings" (or "outlays"). The sum of the entries on each row (receipts) is equal the sum of the entries on the corresponding column (outlays) thanks to the double-entry bookkeeping rule of national accounts. The transactions appearing in the SAM difference between the total resources and expenditure of one account is a balancing item (shaded blue) that feeds into the following account as a resource.

The social and economic structure, with its institutional behaviours and market structure, is a persistent feature of an economy and reproduces itself in the absence of major policy or structural changes. Such a structure is largely represented by a country-level SAM as introduced earlier. This implies, for instance, that some production and consumption coefficients can be given in the short term because investments or policy interventions are needed for production and consumption structures to change.[40]

Therefore, like the input–output multiplier analysis, the SMSD includes interindustry linkages and, like the SAM multiplier analysis, it extends them to production, income, distribution and consumption linkages. Additionally, it includes price and quantity interaction, which can take into account more complex distributional behaviours and effects in production, consumption and investment. Contrary to standard computational general equilibrium models, the price mechanism and the assumption of competitive markets and full (or fixed) employment of resources do not dominate the economic adjustment mechanism, nor the results of the analysis.

The structuralist approach emphasizes the relationship between the structure of the underlying economy and the impacts of policies on social and economic outcomes. It allows for fixed production capacities and rigid production structures in the short run, non-price-taking behaviour in product and factor markets, and persistent patterns of consumption and savings across income groups. Changes in capacity constraints, often induced by the policy or investment to be assessed, generate rich medium- to long-term effects across an economy on production, prices, employment and incomes. This provides some characteristic analytical advantages to this methodology over computational general equilibrium models, input–output analysis and SAM multiplier analysis.

39 See European Commission (2003) for a complete description of the structure of the SAM following the system of national accounts.

40 Data availability can be a limiting factor in producing SAMs with up-to-date reference years. This challenge is particularly evident in the interindustry transaction component of the SAM, as well as in components that rely on labour force and household surveys. Ideally, a "benchmark SAM" should draw from data referring to the same year, providing a consistent snapshot of the economy's structure. However, due to data limitations, it is not uncommon to use a reference year that is five or more years in the past. While there are methods to update SAMs using available data from significantly different time periods, researchers must carefully weigh the benefits and drawbacks of altering a consistent benchmark SAM with data from another year, as doing so can introduce a counterfactual structure. For many computational models – including the SMSD model –, results are calculated as relative changes from the baseline. As a result, the potential drawbacks of using an older SAM are often mitigated.

▶ **Table 4.1. Standard fully aggregated SAM with complete sequence of accounts: 2019 SAM for Namibia**

Account		1. Goods and services	2. Production	3. Generation of income	4. Allocation of primary income	5. Secondary distribution of income
	Classifications	*Products*	*Industries*	*Primary input categories*	*Institutional sectors*	*Institutional sectors*
1. Goods and services	*Products*	Trade and transport margins 0	Intermediate consumption 112 366			
2. Production	*Industries*	Output (basic prices) 280 074				
3. Generation of income	*Primary input categories*		Gross value added (basic prices) 167 738			
4. Allocation of primary income	*Institutional sectors*	Taxes less subsidies on products 13 473		Generated income 167 733	Property income 11 476	
5. Secondary distribution of income	*Institutional sectors*				Gross national income 176 764	Current transfers 37 248
6. Use of disposable income	*Institutional sectors*					Disposable income 195 698
7. Capital	*Institutional sectors*					
8. GFCF	*Industries*					
9. Financial						
10. Rest of the world, current		Imports of goods and services 84 264		Compensation of employees to ROW 406	Property income to ROW 8 498	Current transfers to ROW 2 755
11. Rest of the world, capital						
12. Total		377 810	280 074	168 139	196 739	235 701

Note: This table takes the 2019 SAM for Namibia as numerical example for the standard SAM.

Source: Based on the ILO's and Namibia Statistics Agency's 2019 SAM.

	6. Use of disposable income	7. Capital	8. GFCF	9. Financial	10. Rest of the world, current	11. Rest of the world, capital	12. Total
	Institutional sectors	*Institutional sectors*	*Industries*				
	Final consumption expenditure 171 733	Changes in inventories –764	GFCF 28 542		Exports of goods and services 65 962		377 811
							280 074
					Compensation of employees from ROW 401		168 138
					Property income from ROW 4 057		196 739
					Current transfers from ROW 21 688		235 701
							195 698
	Savings 23 965	Capital transfers 1 869				Capital transfers from ROW 1 664	27 497
		GFCF 28 542					28 542
		Net lending or net borrowing –2 324				Net lending of ROW 2 324	0
							95 922
		174 0			Current external balance 3 814		3 988
	195 698	27 498	28 542	0	95 922	3 988	

For this reason, production sectors can be characterized by different adjustment mechanisms depending on the relative growth of demand for their products and of their overall productive capacity. For example, agriculture, energy and other utility sectors can be capacity-constrained due to a lack of fertile land or large capital investments. Their domestic supply has an upper bound in the short term, and demand can generate price adjustment and/or import effects that affect the entire economy.

Investment operations can build up capacity in these sectors to induce "capacity effects", which ultimately push an economy to a higher growth path that generates long-term employment impacts. Many sectors that are not constrained by capacity can adjust to (limited) increased demand. The assumption is that firms in these sectors have a certain excess capacity due to a large pool of unemployed or underemployed labour and/or capital. In such a situation, firms can set their supply price mark-up higher than their cost of production.

While some sectors are more likely to operate under full capacity than others, the structural model allows for an endogenous determination of the state of the sector. The relationship between demand and capacity has an important role in the sectoral and economy-wide outcomes. This underlines the role of investment and demand policies. In sectors where capacity constraints are not binding and mark-up pricing dominates, production costs are directly reflected onto product prices. Because labour and intermediate consumption of products are part of the cost of production and coefficients are fixed in the short term, any change in wages or in the price of intermediate consumption products affects the supply price. Thus, price increases propagate across the economy via cost-push.

Finally, the SMSD modelling framework can include different country- and area-specific modules. For instance, the core model can be extended by:

- adding differentiated labour market and formal versus informal economy behaviour;
- including macro and microsimulation interactions to carry out more detailed and targeted analyses looking at social as well as environmental sustainability; and
- differentiate between conventional and environmental sectors to help identify "green jobs" and provide insights on the impacts of policies and structural changes on socio-economic dimensions that are key to addressing the challenges of a just transition.

In the following sections, we highlight some example applications of the model and its extensions.

4.3. Equitable mining expansion in Namibia

Namibia's natural resources are vast and diverse. With mining companies extracting zinc, copper, coal, diamonds, gold and uranium, there is potential for the creation or strengthening of value added by transforming those raw materials before exporting them. As a pathfinder country under the Global Accelerator (GA) initiative, a key measure identified on their GA road map is to maximize equitable distribution of benefits from the development of the mining sector, such as revenues, employment generation and local supply of goods and services.

4.3.1. Data and assumptions

To carry out a rapid assessment of the social and economic impacts of mining-led expansion and policy options to improve the distributional outcomes, a SAM and SMSD were constructed for Namibia. The ILO and the Namibia Statistics Agency jointly produced the 2019 Namibian SAM. Table 4.1 shows its overall structure. The outcome of the year-long project is a SAM with 40 products, 52 activities, 22 occupational categories and 10 household types. The SAM was produced using the following steps:

- Production and balancing of the supply and use tables (SUTs), which distinguishes products and activities based on national account statistics.
- Generation of a complete set of institutional sectors' accounts for corporations, government and households based on general government budget data, balance of payments statistics and other national accounts statistics.
- Construction of the GFCF matrix, which links investment types by source with their destinations based on national statistics on capital formation.
- Compilation and balancing of the SAM based on the SUT, institutional sectors' accounts,

the GFCF matrix and other national accounts. This includes a detailed breakdown of the compensation of employees in various formal and informal occupational categories, as well as the breakdown of households into various household types (rural and urban by income quintiles) based on micro statistics, such as the labour force survey and the household income and expenditure surveys.

A characteristic feature of this SAM is the inclusion of a full GFCF matrix, which represents the use of capital goods by productive activities and the flow of products (source) to industries (destinations). Second is the detailed occupational breakdown of employee wages/compensation. And the third feature is the distinction between formal and informal status at both activities (enterprises) and occupational levels.

The model for Namibia follows the core model as described in section 4.2, with the following sectoral specifications.

- The **agricultural sectors** are assumed to be constrained by the availability of capital and fertile land; therefore, they have fixed domestic supply. As demand changes, prices adjust to clear the market with flexible profit share.

- The export demand for **uranium ore, other metal ores, diamonds, and other mining and quarrying products** are determined exogenously, so that the scenario of increased mining exports demand can be simulated.

- **Utility and transport sectors** are constrained by fixed capacity; therefore, their domestic output is fixed. However, an investment operation can build capacity in these sectors, which ultimately pushes the economy to a higher steady state, generating long-term or permanent employment.[41]

- **Other sectors'** (including manufactures, construction and other services) domestic products are free to adjust to demand, in other words they are "demand-driven". The assumption is that firms in these sectors operate with excess capacity due to a large pool of unemployed and underemployed labour or capital, and firms would set their price mark-up higher than their cost of production. Since labour and intermediate inputs are part of the cost of production, any changes in wage or price of other products would affect the price in these sectors via cost-push.

A characteristic feature of this SAM is the inclusion of a full GFCF matrix, which represents the use of capital goods by productive activities and the flow of products (source) to industries (destinations).

4.3.2. Policy scenarios and results

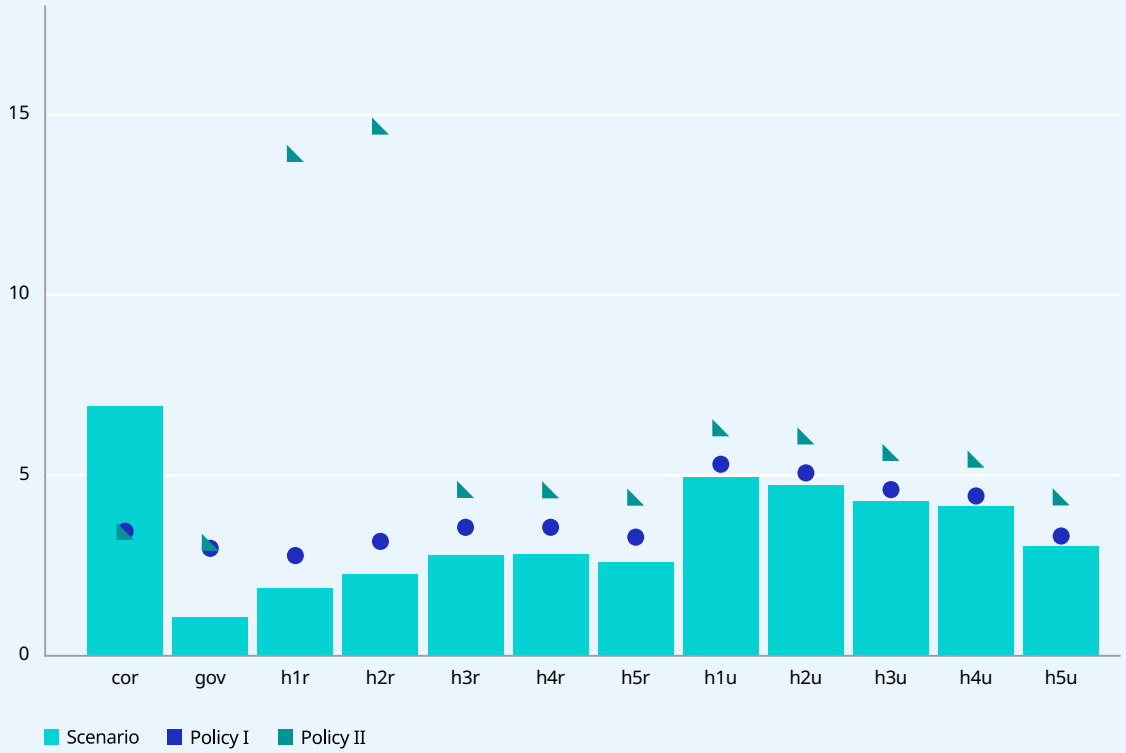
The simulated scenario of growth led by mining exports shows a 20-per-cent increase in mining exports, and the results are labelled as "Scenario". Subsequently, two more policy experiments were conducted, labelled Policy I and Policy II. The results on real incomes are shown in figure 4.1.

Figure 4.1 indicates the effects of 20 per cent mining exports growth on real incomes. A large part of the gains would be accruing to firms and urban households, exacerbating the inequality between rural and urban households, and between profit and wage incomes. The government also experiences some real budget improvement, though limited, mainly due to higher tax revenues collected from the various increased income streams.

The simulation of Policy I is a simple increase of corporate tax by 50 per cent on companies' accrued real income only; while the government maintains its patterns of saving and expenditure. It is evident that Policy I would improve the government budget and make more resources available for both deficit reduction and social investment and spending. Notice that, in this case, rural households experience higher real income gains than urban households;

41 The model is also used to study the capacity effects of infrastructure investment projects in Namibia, which is why utility and transport sectors are modelled with some specificities. But the results are not shown in this chapter.

▶ Figure 4.1. Simulated percentage change of real income with mining-led growth and policy intervention scenarios



Key: cor = firms/corporations; gov = government, h#r = rural household, #th income quintile; h#u = urban household #th income quintile.

that is because of the higher baseline rate of government transfer to rural households. Thus, there will be some improvement in rural–urban income inequality.

As an alternative policy option (Policy II), the government uses the additional tax revenues from corporations and available fiscal space to further expand social investment and spending, while holding its budget constant. In particular, the government increases spending on healthcare by 15 per cent and uses the remaining fiscal envelope to subsidize poor rural households in the form of cash transfers. The additional expenditure on the healthcare sector generates an economy-wide demand effect, which results in higher income for all households. Moreover, the cash subsidy for poor rural households pushes up the real income of first- and second-quintile rural households significantly, which is expected to reduce rural poverty and inequality by a considerable extent.

While the two policy options imply the same change in real government revenues in figure 4.1, the difference lies in their allocation between spending and deficit reduction in figure 4.2.

Figure 4.2 indicates the net government savings under various circumstances. Going from baseline to the scenario of the expansion of mining exports (in the absence of any other policies), there is an increase of net government savings (or reduces government deficit). From "Scenario" to "Policy I", there is further improvement of the government's fiscal position because it is assumed that the government's saving propensity is fixed. Alternatively, the government can hold its fiscal position constant at "Scenario" level, and use the extra fiscal space on social investment and spending, which is indicated by "Policy II" in figure 4.2. With this policy option, there is no improvement of fiscal position compared to the "Scenario" level, but in return, there is higher positive social and economic

▶ **Figure 4.2. Net government saving in simulated policy intervention scenarios** (variation of budget deficit)

impacts as demonstrated in figure 4.2. This analysis effectively demonstrates the trade-offs policymakers often need to face between reducing fiscal deficit and social spending.

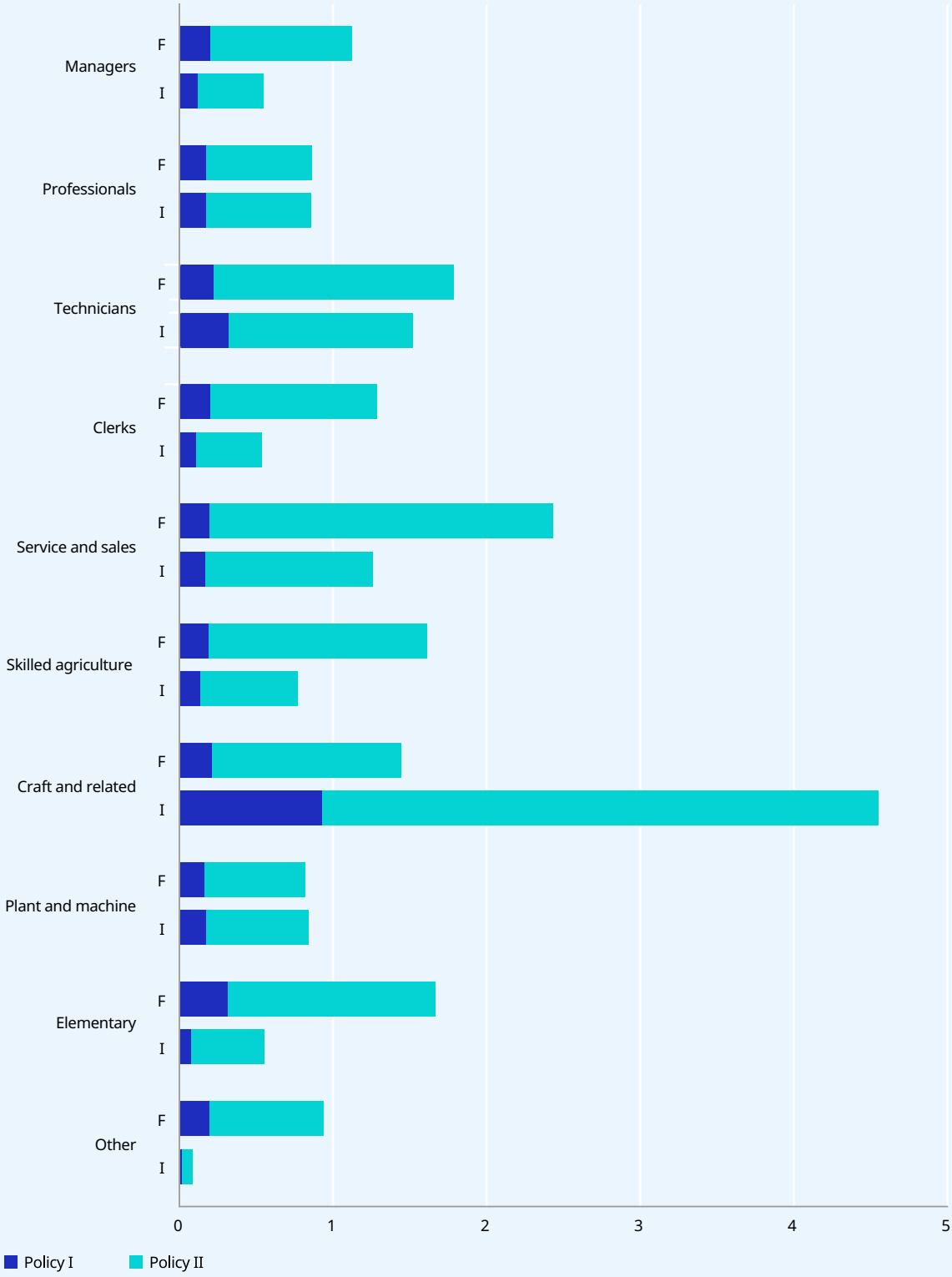
Finally, since the SMSD is an economy-wide model, the policy options above can also be simulated for impacts beyond real income. For example, figure 4.3 illustrates the employment impacts of the two policy options over ten occupational categories, each broken down by formal and informal employment.

In figure 4.3, the ten occupational categories are broken down by formal and informal employment. It is evident that the employment impact is rather large with Policy II, particularly for informal craft and related occupations, formal services and sales occupations, formal technicians and formal elementary occupations. The high employment impacts on craft and related occupations can be explained by the expansion of construction activities (for healthcare facilities), which generate labour demand for construction workers in the craft occupational category. However, as previously hinted, these positive employment impacts are the payoffs from utilizing the extra fiscal space from corporate tax increase on social spending and investment.

4.4. Just energy transition in Bosnia and Herzegovina

The process of energy transition can have uneven country-level impacts geographically and socially. Coal mines and coal-fired power plants closures are regarded as the natural requirement for a transition towards more environmentally sustainable energy systems. These closures typically affect the mining sector as well as its upstream and downstream activities, their employment and the communities relying on such sources of income.

▶ **Figure 4.3. Employment impacts by occupation** (percentage change)



Key: F = formal; I = informal.

A transition to more sustainable energy systems also implies the expansion of renewable energy production, the creation of jobs and the environmental and economic benefits associated with it. While the transition can, in principle, have a positive net and aggregate economic and employment effect at the country level, this is not warranted at the local level and across groups of workers and communities. This is the case of Bosnia and Herzegovina, where employment in the mining sector represents a small and slightly declining share of national employment. The energy transition may create new jobs and incomes associated with the adoption of new technologies, the development of infrastructures and operations of more environmentally sustainable energy systems at the country level. However, it can also destroy jobs in communities dependent on conventional energy production, with repercussions on the incomes and activities on the local economies and spillover effects in the entire economy.

4.4.1. Data and assumptions

A version of the SMSD was used to identify the short- to medium-run impacts of closing coal mines and coal-fired power plants, and expanding the production of renewable energy. A 2015 SAM for Bosnia and Herzegovina was produced as follows:

- In the absence of a benchmark SUT, an analytical SUT was compiled using available statistics and estimation techniques, where information was missing – such as the interindustry structure of consumption. The SUT classifications of industries and products used are consistent with the statistical classifications of economic activities (NACE Rev.2) and of products by activity (CPA 2008 version) in Europe.

- A complete set of institutional sector accounts was produced for corporations, government and households, using general government budget data, balance of payments statistics and other national accounts sources. The GFCF matrix was compiled mapping investments by destination with the demand of capital goods and services, using national statistics on capital formation.

- The SAM was compiled – including a detailed breakdown of employee compensations across occupational categories, as well as the disaggregation of households by income quintile, using labour force surveys as well as household income and expenditure surveys. A total of 37 NACE and 49 CPA standard classes are included in the SUT. For the SAM, output was first aggregated to 12 products and industries to be consistent with household budget survey data.

- Finally, *mining manufacturing* and *utilities* were separated, and *mining and quarrying* was split into "coal mining" and "other mining", while *electricity supply* was split into "conventional electricity" and "renewable electricity" supply. This resulted in 17 products and industries.

We assume that most sectors are unconstrained and demand-adjusting, while *coal mining* and *conventional* and *renewable electricity* are capacity-constrained. This is consistent with the fact that additional investment or disinvestment is needed to modify the actual output and employment in those sectors. Consequently, the output of such industries is changed following the energy transition polices.

We also assume that the demand and output of *other mining products* depend on an exogenously determined export demand at a given international price.

Changes in capacity, whether through expansion or contraction, affect both prices and profitability, if demand for their outputs is sufficiently strong. Via their elasticity to price changes, imports and exports help moderate price fluctuations and adjust to changes in the magnitude and composition of aggregate demand.

Driven by the energy transition policy, capacity adjustments in constrained sectors result in variations in output that are not directly linked to demand injections. These capacity effects propagate through the economy indirectly, via shifts in relative prices and incomes, thereby generating further indirect and induced impacts.

4.4.2. Policy scenarios and results

Scenario 1

The closing of mines and coal-fired power plants in Bosnia and Herzegovina with no offsetting expansion in renewable energy production, can have a very large effect on the entire economy via the contraction of jobs and incomes, rising energy prices and imports. Figure 4.4, panel A, shows the

percentage reduction in production, employment and CO_2 emission by sector. The indirect effects of rising energy prices and imports, job and income losses affect production and employment across all other industries, inducing, in many cases, over 5 per cent of losses. *Plant and machine operators, and assemblers* are mostly affected, followed by and *technicians and associated professionals*; *craft-related trades workers* and *elementary occupations* (figure 4.4, panel B).

Savings contract for households of all income groups, and the budget deficit of the government, may soar assuming constant expenditure, while the trade deficit increases significantly due to rises in product prices and energy imports (figure 4.1, panel C). Household income losses range from 5 to 7 per cent (figure 4.4, panel C).

Scenario 2

This scenario entails closures of mines and coal-fired power plants and the expansion of renewable energy production, which offsets energy production losses. The effects on the rest of the economy are largely mitigated, although output and employment of some other sectors may undergo a mild contraction.

Figure 4.5, panel A, shows that this scenario would require an increase of renewable energy production by a factor of 2. Offsetting energy production losses does not imply, however, a net positive jobs effect in the medium run, and generates a strong mismatch in the skills needs. Figure 4.5, panel B, shows a 10-per-cent loss of jobs in *plant and machine operators, and assemblers*, and a 5-per-cent loss in *elementary occupations*. Job losses for *professionals*, as well as *technicians and associated professionals* and *craft-related trades workers*, are partly offset by the increased demand of renewable energy production and overall mitigation of the economic impacts on other sectors, compared to Scenario 1. The simulation shows that the job gains generated by replacing energy sources do not fully balance job losses (figure 4.5, panel B). In this scenario, incomes contract moderately, but government and external balances worsen (figure 4.5, panels C and D).

Figure 4.5, panel B, shows that investments and production growth in sectors other than energy are needed to absorb jobs lost during the transition. Such growth can either emerge from complementary industrial policies or from other sources of demand and growth. In any case, it can be expected that the demand for the occupations and skills that may absorb redundant workers will come from different industries and locations. There will be a skills mismatch (here proxied by the change in the demand for workers in specific occupations) and a significant need for reskilling and retraining of workers.

Scenario 3

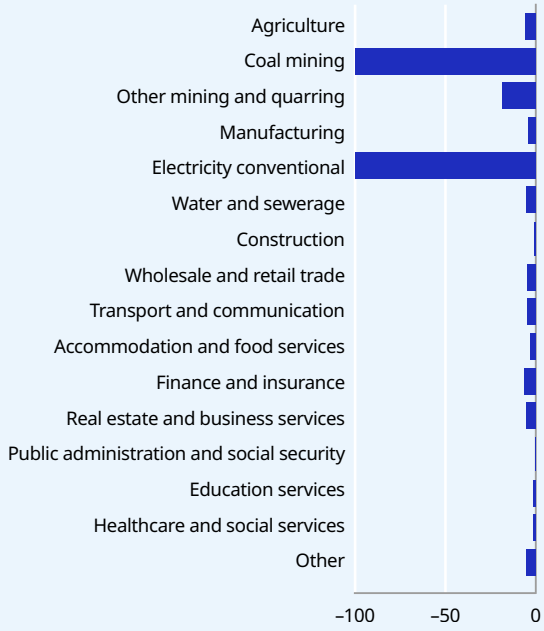
A final scenario simulates the counterfactual of closing of coal mines and power plants with a complete reallocation of employment by occupation, and preservation of household incomes. This analytical experiment shows the limits to the absorptive capacity of all sectors for employment given the current occupational structure. The scenario also takes into account price and demand effects induced by the closing of coal mines and coal-fired power plants. Figure 4.6, panel A, shows that electricity from renewables could grow in response to the rise in prices and the fall in imports of electricity. Other sectors – such as *transportation and communication*; *construction* and *other services* – will need to expand to employ displaced workers – mostly *plant and machine operators, and assemblers*; *technicians and associated professionals*; *craft-related trades workers* and *elementary occupations*. This expansion will however crowd out the demand for other complementary occupations, such as *managers*; *professionals* and *clerical support workers*.[42] Changes in disposable income for households are minimized (figure 4.6, panel D) as employment is reallocated across sectors by occupations, and wage changes are offset by construction. Government and external balances may worsen moderately (figure 4.6, panel C).

This scenario is obtained assuming no need for reskilling or changes in occupations and incomes for displaced workers. As the changes in production required for this outcome are unlikely to be

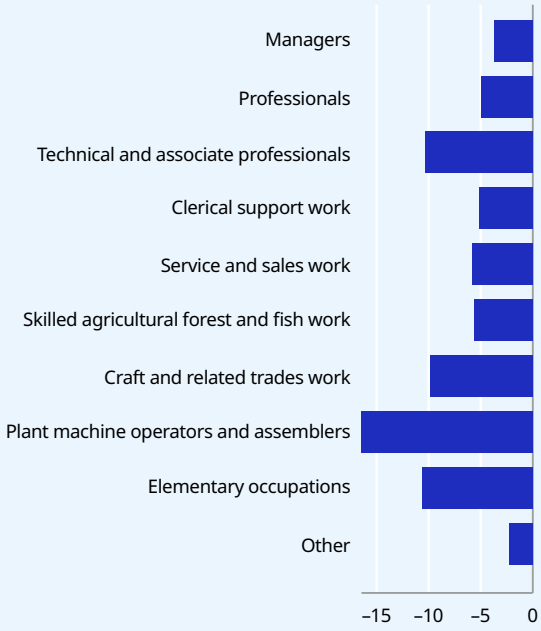
42 This effect resembles the expected outcomes of factors' supply changes according to results of the Rybczynski theorem. The theorem states that a rise in the endowment of one factor will lead to a more than proportional expansion of the output in the sector which uses that factor intensively, and an absolute decline of the output of the other good. Also in this scenario, the change in supply of occupations (induced by closing of mines and traditional energy production) have uneven effects on sectoral production with expansion and contraction of employment according to their occupation intensity.

▶ Figure 4.4. Estimated change from baseline values following Scenario 1 (percentage change)

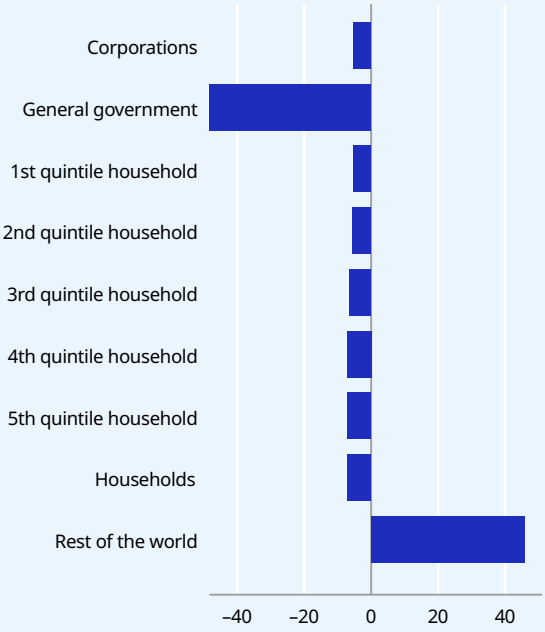
A. Changes in production, employment and CO_2 emissions by industry



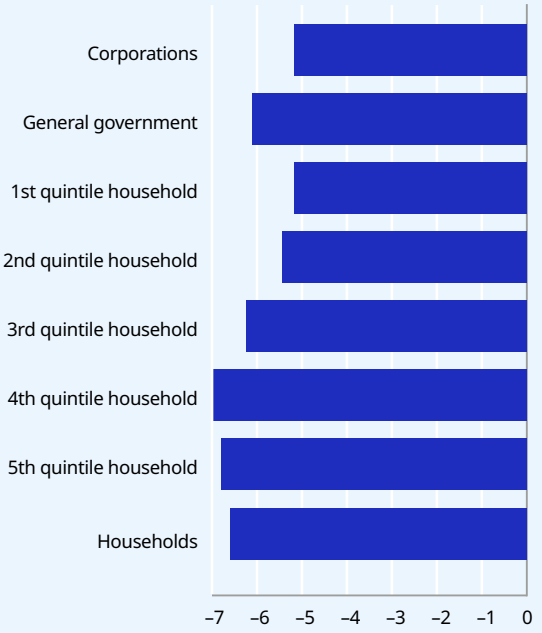
B. Changes in aggregate employment demand by occupation



C. Changes in the balances (or savings)

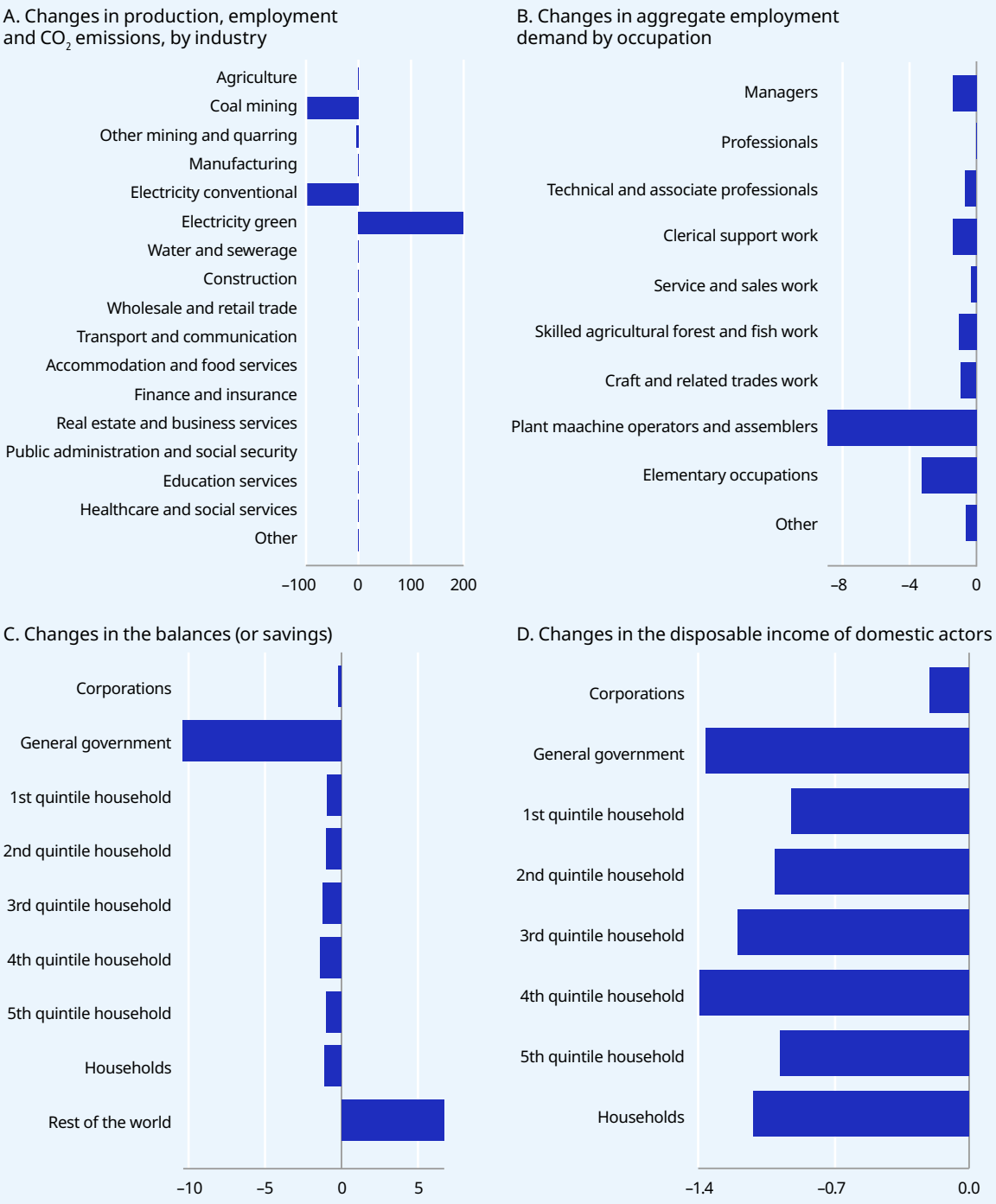


D. Changes in the disposable income of domestic actors



Note: The simulations are based on the SMSD for Bosnia and Herzegovina.
The simulations isolate the effects of closing coal mines and coal-fired power plants at the country level.
Panel A shows variations equivalent for all sectors given, as employment and CO_2 emissions are proportional to production in each sector.
In panel C, a positive change in the balance of the rest of the world means a worsening of the domestic current account. Households are grouped by consumption quintiles.

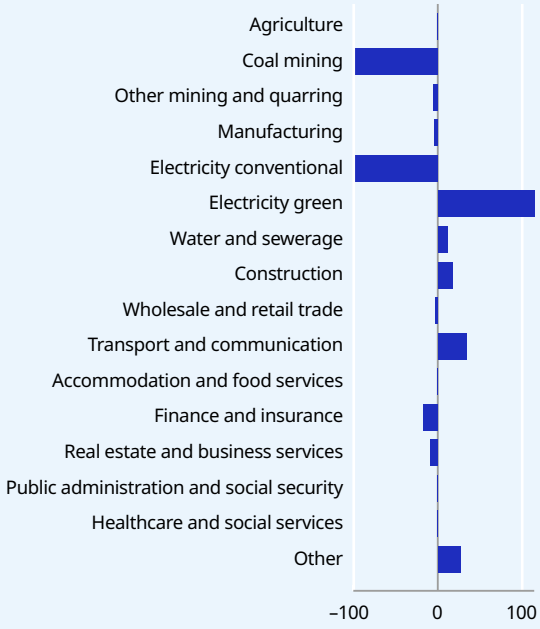
▶ **Figure 4.5. Estimated change from baseline values following Scenario 2** (percentage change)



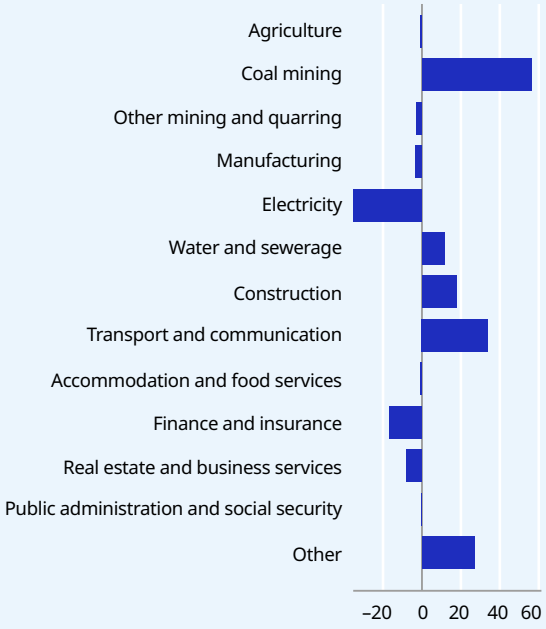
Note: The simulations are based on the SMSD for Bosnia and Herzegovina.
The figure shows the joint effects of the closing of coal mines and of coal-fired power plants and offsetting the production of renewable energy.
Panel A shows variations equivalent for all sectors given, as employment and CO_2 emissions are proportional to production in each sector.
In panel C, a positive change of the balance of the rest of the world means a worsening of the domestic current account. Households are grouped by consumption quintiles.

▶ Figure 4.6. Estimated change from baseline values following Scenario 3 (percentage change)

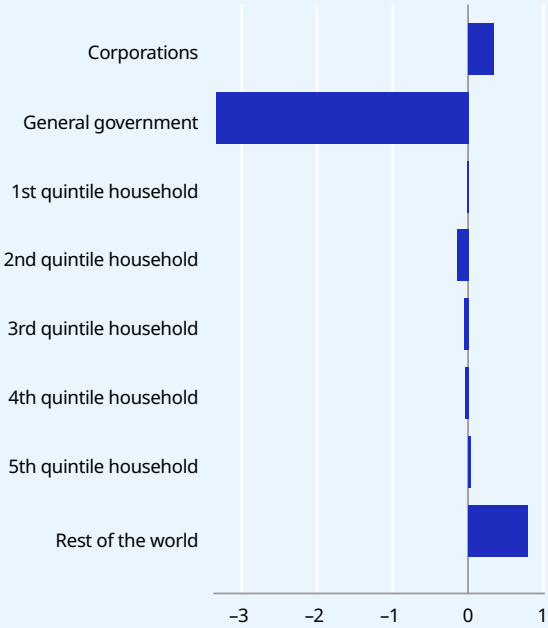
A. Changes in production, employment and CO_2 emissions by industry



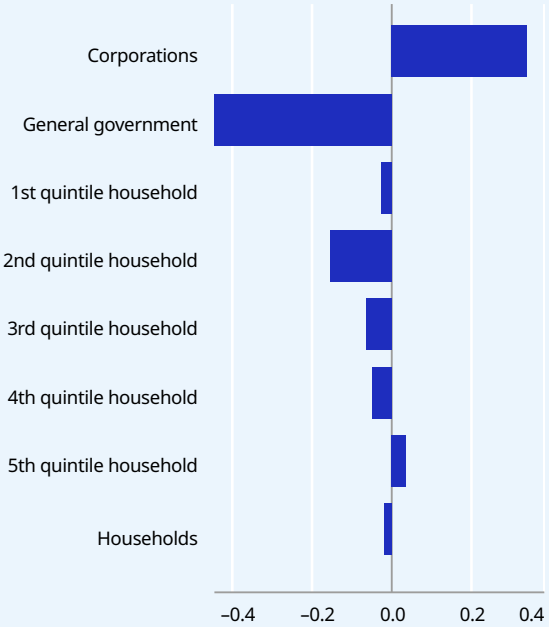
B. Changes in imports by product



C. Changes in the balances (or savings)



D. Changes in disposable income of domestic actors



Note: The simulations are based on the SMSD for Bosnia and Herzegovina.
The figure shows the effects of closing of coal mines and power plants, with a complete reallocation of employment by occupation and preservation of household incomes.
Panel A shows variations equivalent for all sectors given, as employment and CO_2 emissions are proportional to production in each sector.
In panel C, a positive change in the balance of the rest of the world means a worsening of the domestic current account. Households are grouped by consumption quintiles.

supported by domestic and international demand in Bosnia and Herzegovina, the scenario results confirm that the energy transition will:

- affect the occupational composition of employment and income;
- require substantial changes in skills and occupations; and
- require complementary sectoral policies to support growth across the economy and absorb dismissed workers.

The analysis shows that there are significant mismatches in the nature and composition of jobs, as well as in the skills profile of the old and new jobs. Moreover, full absorption of the workers made redundant by the direct and indirect effects of the energy transition policy depends on the level of investment, not only in renewable resource energy production but also in other sectors of the economy.

Investments and production growth in sectors other than renewable energy are needed to absorb job losses linked to the transition. Such investment and production growth can either emerge from complementary industrial policies or from other sources of demand and policies. The demand for the occupations and skills that may absorb redundant workers is expected to come from different industries and locations; hence, a need for reskilling and retraining of workers.

The findings of the analysis reinforce the widely acknowledged need to inform energy transitions along the principles of a just transition that leaves no one behind. They also stress the importance of paying more attention to the social and economic dimensions of decarbonization, which are often neglected in the policy discussions on energy transition.

These conclusions, among others, indicate the need for a comprehensive, coordinated and multisectoral strategic approach to the transition, which focuses on:

- retraining those who can be employed in other industries;
- employment support through ALMPs;
- social packages for those who cannot be reintegrated into the world of work; and
- diversification of economic activity in localities highly dependent on the mining sector through (pro)active and long-term industrial policy.

Therefore, net social economic gains of the transition are conditional to targeted reskilling and social protection policies, as well as sectoral policies that support the diversification of production and exports. The principles of "just transition" are particularly relevant in this context and their application is necessary to achieve environmental as well as economic and social sustainability.

4.5. Employment and household impacts of investment plans in Senegal: An SMSD-microsimulation analysis

In its recent national development plan (2025–29), Senegal has outlined a strategic allocation of 12,821 billion CFA francs over the next five years. This substantial investment aims to support key sectors critical to the nation's economic growth and development. Of this allocation, 10.5 per cent will be directed toward the agriculture, livestock and fishing sectors, while 11.2 per cent will fund improvements in transport infrastructure. The remainder will fund various other programmes but the present study focuses specifically on these two investment operations. For the agriculture, livestock and fishing sectors, the primary focus is on mechanizing production processes to enhance productivity and efficiency. Meanwhile, transport infrastructure investments will prioritize both the rehabilitation of existing roadways and the development of a new road and sea transport line, addressing pressing needs in connectivity and accessibility (DGPPE 2022).

4.5.1. Data and assumptions

A rapid ex-ante assessment of these investment operations calls for a detailed SAM for Senegal to effectively measure potential impacts. However, a high-quality, detailed SAM is not currently available. Instead, available data include an aggregated SAM produced by Senegal's National Agency for Statistics and Demographics (ANSD). The SAM was constructed through a detailed methodological process, primarily using data from the SUT and

the integrated economic accounts. This production process involved three main steps: the creation of a standard SAM with six aggregated accounts, followed by the development of a primary SAM and, finally, an adjusted micro-SAM, tailored to capture economic specifics more precisely. Each step focused on integrating and reconciling data on production, income and expenditure flows across economic sectors. For the micro-SAM, the ANSD further refined data to expand accounts into 65 distinct categories, detailing 28 sectors of activity and 28 product groups, alongside 5 key institutional sectors (non-financial corporations, financial corporations, government, households and non-profit institutions serving households) and 2 production factors (labour and capital) (ANSD 2024).

Despite being referred to as a micro-SAM, it is in fact highly aggregated, containing only a single labour category and one broad households category. This level of aggregation limits the insights that a model based on it can provide, especially regarding the social and employment impacts of interventions. For instance, while the SAM could simulate potential impacts on employment by sector and the total household income, it lacks the detail necessary to differentiate between various types of employment and household groups. Consequently, it remains silent on important distinctions, such as gender, age, occupation, informality, disability status, poverty level and household income distribution. Addressing these categories would require strong, often unrealistic assumptions, diminishing the SAM's capacity to inform nuanced, targeted policy interventions.

Microsimulation and tree-based machine learning

To address data limitations and increase the versatility of the SMSD framework, the microsimulation module (SMSD-MS) was designed and integrated into the model. Microsimulation is a method that uses detailed individual or household-level data to simulate the potential effects of policy changes on specific population groups. By focusing on variables such as employment status, income and demographic characteristics, microsimulation models allow analysts to estimate how different interventions might impact diverse groups within a population, capturing variations in responses that broader models may overlook. When combined with the SMSD, microsimulation enhances the analysis by applying macro-level outcomes to micro-level datasets, like household and labour force surveys. This integration enables a more nuanced examination of policy impacts, effectively linking economy-wide changes with outcomes at the household or individual level.

> In the top–down approach, macro-level changes from the SMSD are applied to the microsimulation model to assess impacts on individual units.

The integration of microsimulation models with macroeconomic frameworks, such as the SMSD, generally employs a top–down, bottom–up or dynamic approach. In the top–down approach, macro-level changes from the SMSD (for example, shifts in prices or employment) are applied to the microsimulation model to assess impacts on individual units, such as households, without allowing feedback to influence SMSD results. Conversely, the bottom–up approach enables dynamic interaction, where responses at the micro level, like changes in labour supply or consumption, are aggregated and fed back into the SMSD. The dynamic approach iterates between the top–down and bottom–up methods, continuing until both macro- and micro-outcomes converge, allowing for a comprehensive analysis that captures both levels of economic behaviour. In the present report, the top–down approach is employed, where the investment shock is first applied in the SMSD macro model, generating macroeconomic outcomes, such as sector-specific employment, price indices and changes in aggregate household income. These results are then inputted into the microsimulation model to produce more nuanced insights on employment and household effects.

Microsimulation techniques vary widely, from simple, static models based on hypothetical families to more complex spatial and dynamic models (O'Donoghue 2021). The microsimulation procedure in this analysis consists of two distinct steps. The first step

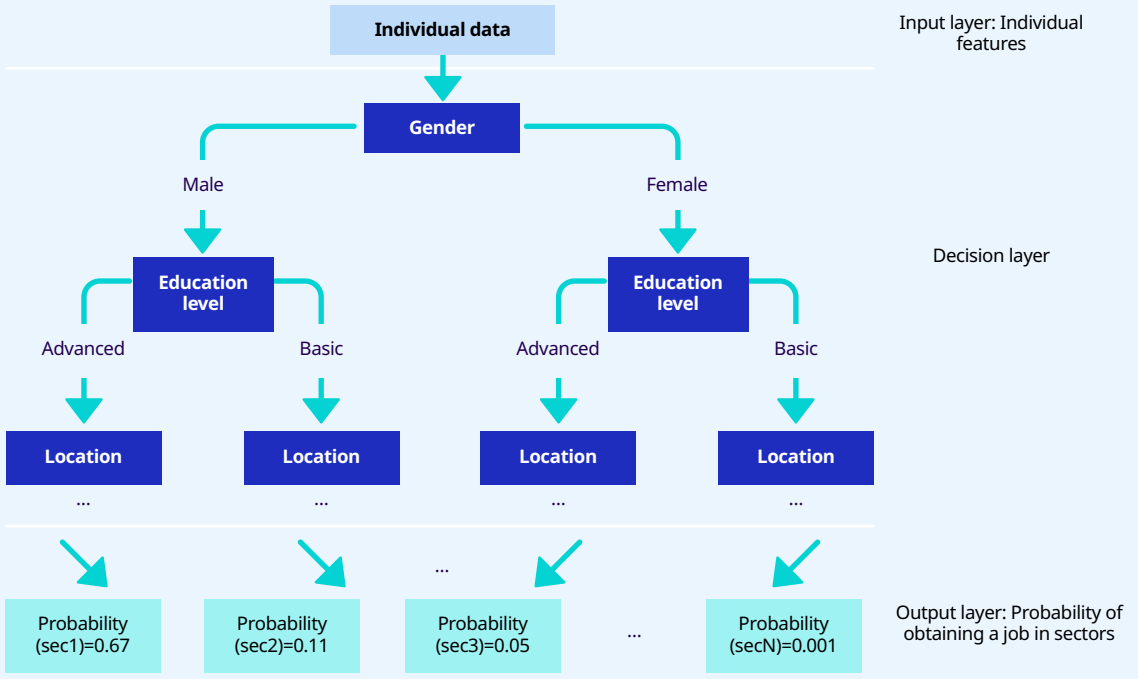
involves estimating transition probabilities for each individual in the population sample, indicating their likelihood of being employed in different economic sectors based on their personal and household characteristics. These probabilities capture the underlying patterns in labour market behaviour and serve as the foundation for simulating responses to economic changes. The second step applies these probabilities, along with a set of predetermined rules, to simulate actual changes in individual status. When macro-level shocks occur – such as changes in sectoral employment levels projected by the SMSD model –, these rules determine which individuals change their employment status, switch sectors or experience income adjustments. This two-step procedure enables the analysis of both distributional effects (how impacts vary across different population groups) and behavioural effects (how individuals respond to economic changes) of macropolicy interventions. The resulting updated population data provide a detailed picture of potential socio-economic impacts, allowing for an analysis of the changes in employment patterns, income distribution and household income across different demographic and socio-economic groups.

The microsimulation technique employed in this analysis is based on tree-based machine learning (TBML), specifically using the XGBoost (eXtreme Gradient Boosting) algorithm. Tree-based methods operate by creating decision pathways that segment data based on various characteristics, as illustrated in figure 4.7.

In figure 4.7, the top node represents an individual from the household survey data, whose employment sector probability needs to be predicted. Each subsequent split processes different individual characteristics, such as education level, age or previous employment history. The terminal nodes (leaves) of the tree contain probability distributions across all possible employment sectors. Through this structure, the model captures how different combinations of individual characteristics influence the likelihood of employment across various sectors.

TBML methods offer several advantages for this probability estimation task. The technique naturally handles both categorical variables (such as education levels and occupations) and continuous variables (such as age and income) without requiring complex data transformations. The hierarchical structure of decision trees enables the capture

▶ Figure 4.7. Decision tree structure for employment sector prediction



of complex interactions between individual characteristics that influence sector employment probabilities. Additionally, the ensemble nature of XGBoost, which combines multiple trees, provides robust probability estimates while maintaining computational efficiency.

4.5.2. Policy scenarios and results

As a top–down approach, investment shocks are implemented in the SMSD model calibrated based on the SAM. As mentioned earlier, these shocks focus on forming capital in agriculture, livestock, fishing and transport. These shocks generate two types of effects: temporary and permanent. A temporary employment impact is defined as employment generated by activities directly associated with the project itself (such as the building of the productive capacity in those sectors). These jobs exist only for the duration of the investment operation. Permanent employment is employment generated by longer-lasting outcomes of the project. In the current context, the anticipated outcomes of the project are a higher productive capacity for agriculture, livestock, fishing and transport. In economic terminology, this pushes the economy to a higher long-term equilibrium.[43] The SMSD model estimates that the investment operations in its national development plan will generate 145,453 temporary jobs and 51,067 permanent jobs, economy-wide. However, large portions – that is, 61.2 per cent of temporary jobs and 70.7 per cent of permanent jobs – will be self-employment, which tends to be associated with informality.

Figure 4.8 shows the temporary and permanent employment impacts (in percentage) of these investment operations. For the temporary impacts, *construction materials*, *other manufactured products* and *construction services* are sectors that receive the shock directly, resulting in strong employment impacts. Moreover, noticeable effects can also be found in other sectors – such as sales, real estate and domestic services. These are the economy-wide effects. For the permanent effects, there are considerable impacts for the four targeted sectors due to higher productive capacity, as well as economy-wide impacts in most other sectors.

These results are now used as inputs for the TBML in the microsimulation module. The process involves, first, estimating the propensity scores for each household member to find a job in a particular sector with their given characteristics (as inputs for the tree network). Then, the sector-specific job openings are matched with members of households without jobs, based on the ranking of their propensity scores. Figure 4.9 indicates how the temporary and permanent employment effects are distributed across different household categories.

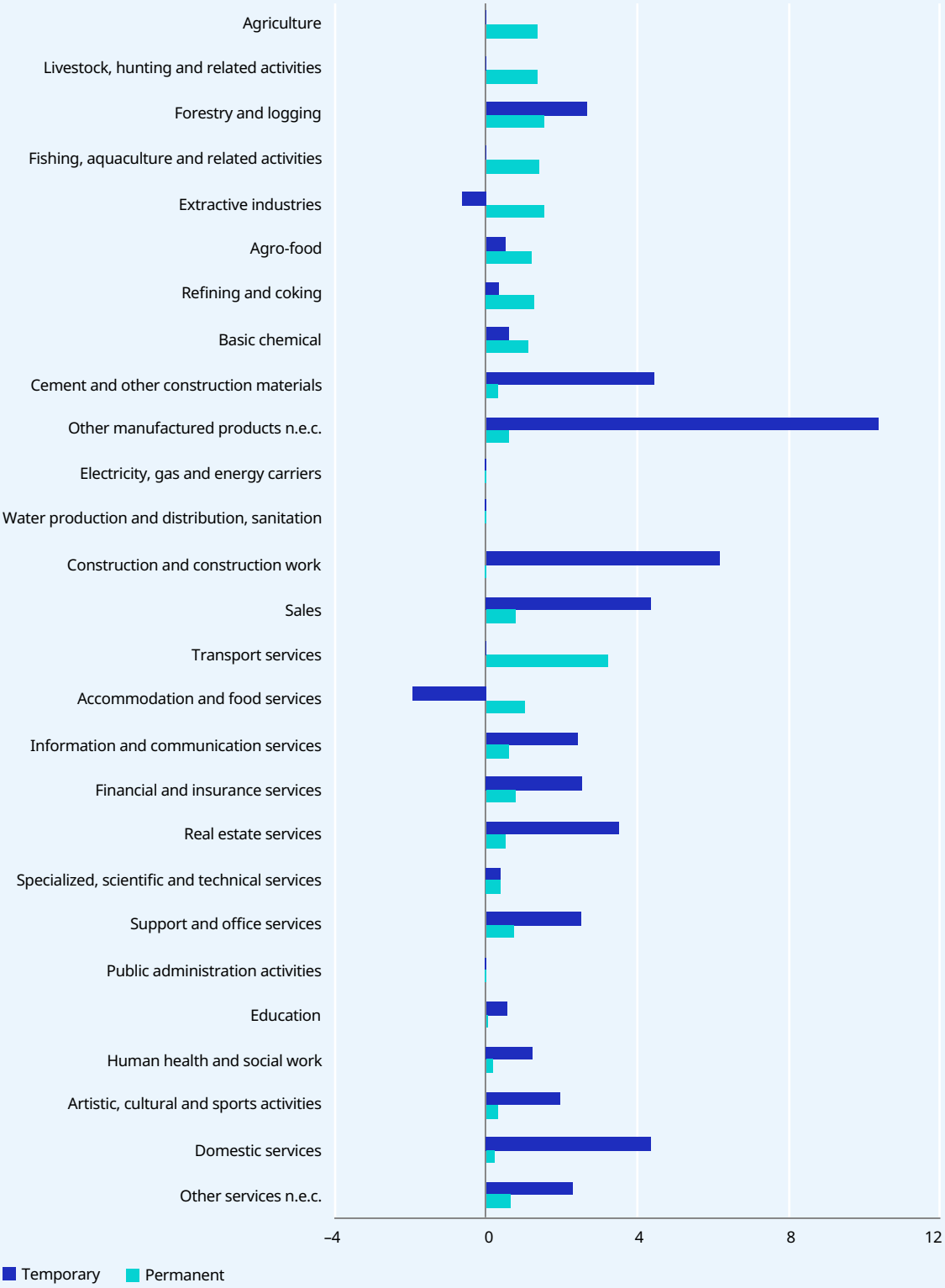
Figure 4.9 shows that the majority of newly generated jobs would go to households with at least one child, and households with at least one child and an elder. Households with none of the characteristics, and households with at least an elder take the smallest shares. These results are not so surprising since the baseline labour force size is larger for the household types that receive larger shares of the pie. In other words, the results are, to some extent, proportional to the baseline distribution of employment across different household types, which is realistic. However, the varied employment effects across different household categories are still of great interest for EmpIA and policy relevance.

The household survey contains detailed information on two categories of informality: enterprise and occupational. Hence, each job can be classified

> The SMSD model estimates that the investment operations in its national development plan will generate 145,453 temporary jobs and 51,067 permanent jobs.

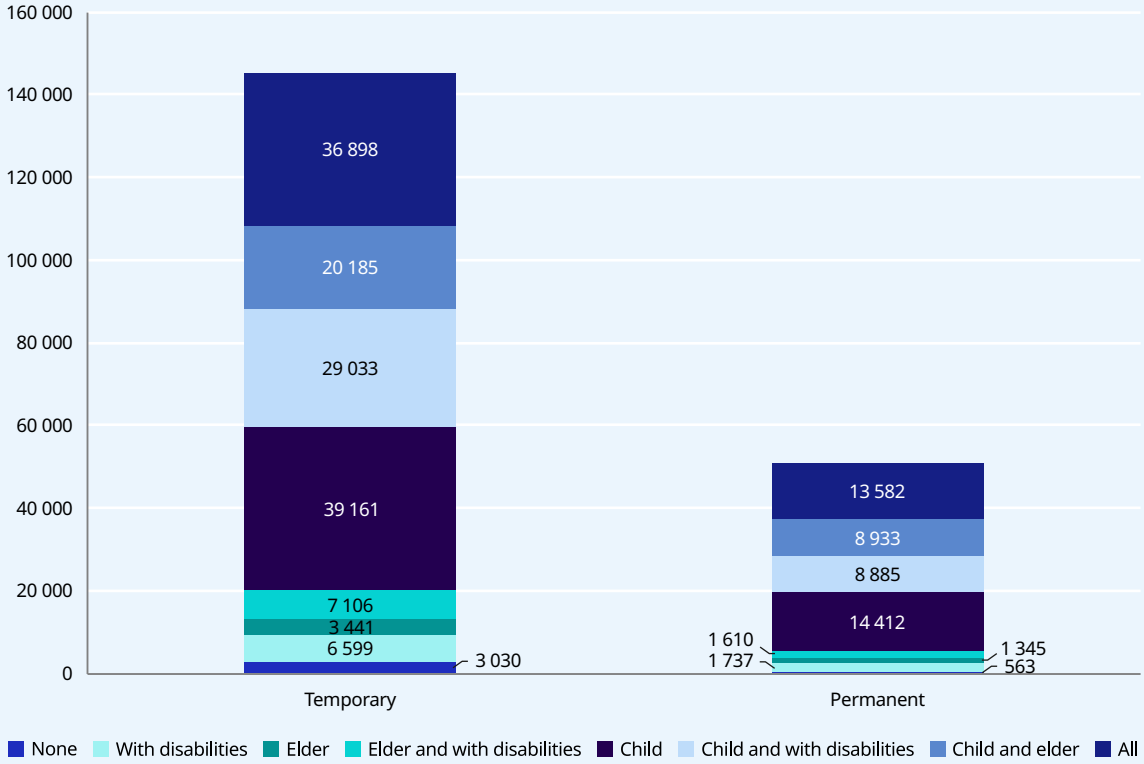
43 Permanent effects should not be confused with permanent jobs, which refers to conditions of employment and the contract types individuals are employed under. Thus, a permanent effect can be filled by people on a permanent contract, but could also be through a series of temporary contracts should the employer choose to do so. For detailed discussions about the distinction between temporary and permanent employment effects, see Jiang and La Marca (2023).

▶ **Figure 4.8. Temporary and permanent employment impacts, by sector** (percentage)



Key: n.e.c. = not elsewhere classified.

▶ **Figure 4.9. Employment impacts by household type** (number of generated jobs)



into one of four categories: formal enterprise and formal occupation, informal enterprise and formal occupation, formal enterprise and informal occupation, and informal enterprise and informal occupation. The TBML is first trained based on household characteristics of the worker as well as the sector the job belongs to, and it is then used to calculate the propensity scores for those newly generated jobs to be formal and informal. Figure 4.10 indicates the share of employment generated that belongs to each category.

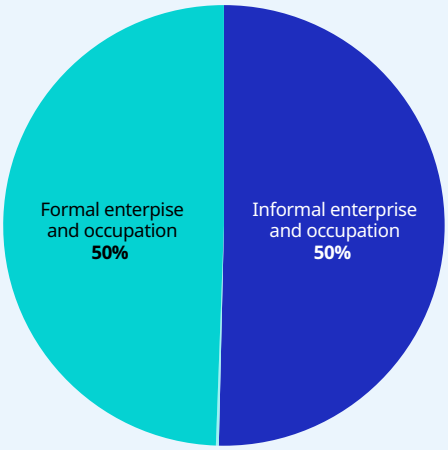
It emerges from figure 4.10 that employment generated belongs to either the informal enterprise and informal occupation category or the formal enterprise and formal occupation category. There is slight employment generation for the formal enterprise and informal occupation category (about 0.9 per cent), and the informal enterprise and formal occupation category does not exist in the data. It is evident that among total employment generated, 50.4 per cent and 62.1 per cent belong to the category of informal enterprise and informal occupation, for temporary and permanent impacts, respectively. However, these results are rather encouraging, especially when compared with the baseline informality rate from the household survey, which is 93.1 per cent for informal enterprise and informal occupation, 2.0 per cent for formal enterprise and informal occupation, and 4.9 per cent for formal enterprise and formal occupation. This implies that the economy-wide employment generated from the investment operations tends to contain a higher share of formality and a lower share of informality compared to the baseline national average.

The microsimulation can also tap into the household income changes resulting from the macroeconomic shock. Table 4.2 presents the real income changes estimated to be experienced by households with various characteristics.

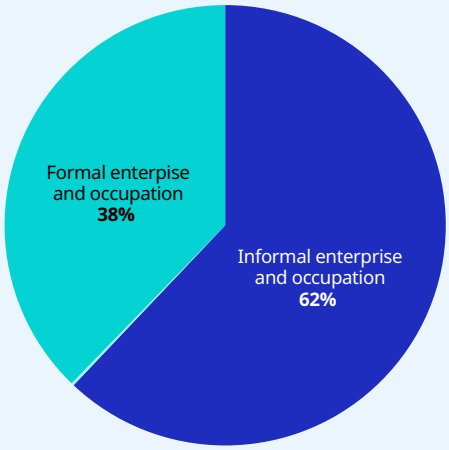
Table 4.2 shows that households with persons with disabilities experience the most substantial real income increases relative to the baseline, with an 8.37 per cent temporary gain and a 1.22 per cent permanent gain. Households with elderly persons and persons with disabilities (6.40 per

▶ **Figure 4.10. Share of employment generated by formal and informal status** (percentage)

A. Temporary employment



B. Permanent employment



Note: No informal occupations, whether temporary or permanent, are generated in formal enterprises.

▶ **Table 4.2. Temporary and permanent real income impacts on households**

	Temporary	Permanent
None	2.84%	0.72%
With disabilities	8.37%	1.22%
Elder	1.63%	0.42%
Elder and with disabilities	6.40%	0.88%
Child	2.79%	0.70%
Child and with disabilities	4.01%	0.97%
Child and elder	3.03%	0.86%
All	2.88%	0.70%

cent temporary, 0.88 per cent permanent) and households with children and persons with disabilities (4.01 per cent temporary, 0.97 per cent permanent) also show notably higher percentage increases. While temporary effects are significantly larger across all household types, permanent real income effects appear more evenly distributed when measured as percentage changes. These microsimulation results are particularly encouraging for households with persons with disabilities, who experience relatively higher income gains. This can be attributed to these households having more underutilized labour potential at the baseline; when domestic demand increases, they can mobilize relatively more labour resources in response.

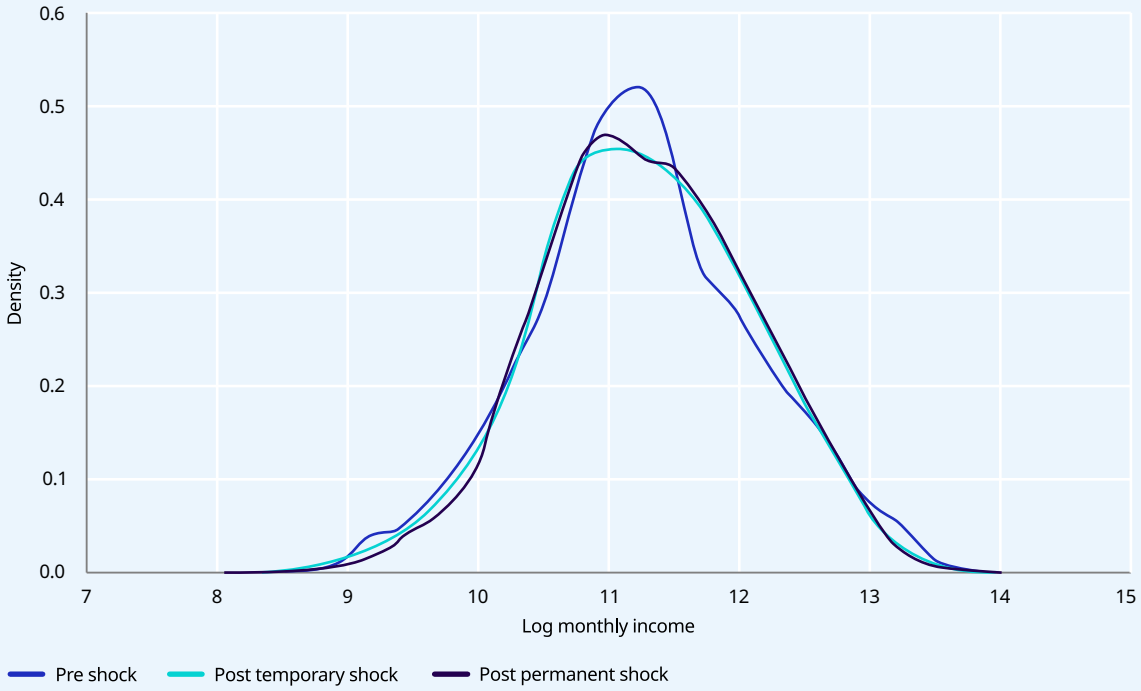
Finally, microsimulation also enables the estimation of the changes in real income distribution caused by the interventions.

Figure 4.11 displays the distribution of log monthly income, where the baseline distribution (pre-shock) reveals a relatively concentrated pattern with a pronounced peak around a log monthly income of 11. This sharp peak indicates a substantial clustering of households within a narrow middle-income range, while fewer households occupy the lower and higher ends of the income spectrum. The pre-intervention distribution exhibits a classic bell-shaped curve but with a particularly concentrated central mass.

Both temporary and permanent economic interventions alter this distribution in similar ways, creating flatter, more dispersed income distributions with lower peak densities than the baseline. The post-intervention curves show relatively higher densities in the upper-middle-income ranges (log monthly income 11.5–13) and slightly lower densities at the central peak. This indicates a redistribution of households across different income levels rather than a simple uniform shift of the entire distribution.

These distributional changes suggest that both interventions likely reduce income inequality, as evidenced by the less pronounced central peak and more even spread of households across the income spectrum. The flattening of the distribution

▶ **Figure 4.11. Distribution of income before and after the intervention**



curve indicates a more equitable distribution of income following the interventions, with a less severe concentration of households at any single income level. While precise inequality measures would require additional statistical analysis, the visual patterns in the density plots strongly suggest that both temporary and permanent interventions contribute to a more balanced income distribution.

In summary, this section demonstrates the top–down SMSD-MS approach to assess the employment and social impacts of Senegal's planned investment in agriculture and transport infrastructure. Combining the macroeconomic features of the SMSD with machine learning-based microsimulation overcomes data constraints often faced by SAM-based models and taps into effects at the detailed household level, while preserving the structural determination of causality and adjustment mechanisms at the macro level.

4.6. Conclusion

The SMSD is a versatile analytical tool designed to address the complex interplay of economic, social and environmental policy challenges in development contexts. Its applicability is demonstrated through diverse use cases, including mining operations in Namibia, energy transitions in Bosnia and Herzegovina, and infrastructure investments in Senegal.

The model is designed to capture the multidimensional effects of policy interventions and investments, with particular emphasis on their impacts on employment, income distribution and inequality. By integrating comprehensive SAM with detailed micro-level data, the model enables detailed analysis of job quality, and sectoral employment shifts and impacts across dimensions – such as gender, age and formality status. This level of granularity is especially valuable for policymakers aiming to design targeted interventions that foster inclusive growth and social justice.

The SMSD balances complexity and accessibility, while maintaining practical applicability. Its flexibility allows adaptation to various country contexts and data environments, functioning effectively with both standardized and customized datasets. This adaptability makes it particularly valuable for developing countries, where data limitations often constrain policy analysis.

Compared to conventional analytical tools, such as input–output models or SAM multiplier analyses, the SMSD offers a more complete representation of economic interactions by capturing price, quantity and capacity adjustments. The model's emphasis on structural characteristics and institutional behaviours provides insights into how policy interventions interact with existing economic structures and constraints, which offers a more realistic assessment of policy outcomes.

The model's comprehensive framework proves especially valuable in analysing transitions – whether in energy systems, industrial structure or other development pathways. As demonstrated in the Bosnia and Herzegovina case study, the SMSD can effectively evaluate both the immediate impacts of transition policies and the complementary measures needed to ensure equitable outcomes. This capability is particularly relevant for designing "just" transition policies that balance environmental sustainability with social protection and economic opportunity. Furthermore, the integration of microsimulation techniques, as showcased in the Senegal case study, further enhances the SMSD's analytical capabilities. This addition allows for more detailed analysis of policy impacts at the household level, providing insights into distributional effects across different demographic groups and helping identify potentially vulnerable populations requiring targeted support.

Looking ahead, simulation models remain essential tools for policymakers navigating the complex challenges of sustainable development. As countries continue to confront interconnected environmental, social and economic pressures, the SMSD's integrated approach to policy analysis becomes increasingly relevant for advancing sustainable and inclusive development outcomes.

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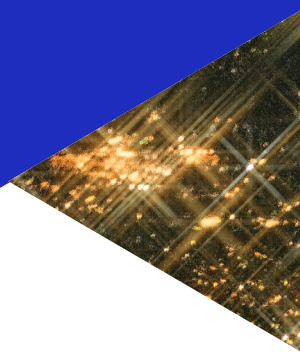

Chapter

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5

Economic and social impacts of transport corridor investments: A GIS data analysis for Kenya and Zambia

Alina Game, David Kucera and Xi Kang

5.1. Introduction

Impact assessments are used to guide the choice and design of prospective policies and investments as well as to evaluate their impacts after implementation. These assessments can be broadly classified as ex ante and ex post, though the lessons learned from ex-post assessments of implemented interventions can also be used to guide prospective interventions. Impact assessments are essential to determine the extent to which interventions:

- have their intended effects on target outcomes and for target beneficiaries;
- are cost-effective, particularly considering alternative interventions.

Particularly relevant from the ILO's perspective are EmpIA. In 2020, the ILO published the *Reference Guide for Employment Impact Assessment* (ILO 2020), providing a survey and addressing the pros and cons of a wide range of EmpIA methods that had been regularly used by the ILO up to that point. Among these methods are CGE models, employment multiplier analysis using input–output (I–O) tables and SAMs, RCTs, meta-analysis and econometric analysis more broadly, relying to varying extents on data from countries' labour force surveys (LFS). Since then, the ILO has initiated work based on the analysis of GIS data, largely supported through the EU-funded project "STRENGTHEN2: Employment impact assessment to maximize job creation in Africa".[44] The ILO's *Reference Guide* was updated to reflect these developments and features a chapter on the analysis of GIS and remote sensing data (ILO 2025). We should be clear from the outset that the analysis of GIS data is not a method as such, but rather the application of an alternative source of data that lends itself to multiple methods of impact assessment, as our chapter will demonstrate by applying two such methods.

> The analysis of GIS data lends itself to multiple methods of impact assessment.

As part of the STRENGTHEN2 project, Game (2021) published a method paper in which she described GIS data analysis as follows:

> GIS provides a framework for the collection, storage, processing and analysis of spatial data. Operationalising the use of GIS for EmpIA is relatively new; however, there has been some research into applying geospatial data for measuring the impacts of infrastructure projects. GIS holds great potential for measuring the employment impacts of infrastructure projects, due to the availability and accessibility of geospatial data. This is particularly relevant in low and middle-income countries where access to data and ground data collection can be more difficult. Spatial data sources, such as satellite imagery provide global availability at high temporal and spatial resolutions which makes them a valuable data source for investigating the impacts of projects at scale, anywhere in the world. GIS can provide a method for measuring the secondary and long-term employment effects of infrastructure investments, investigating the impacts ex post, once a project is complete and operational. Integrating GIS measures with additional economic data, such as that from census or LFS that contains an employment dimension, can be used to gain insights into how infrastructure impacts employment. (Game 2021, 5)

Among the key benefits of GIS data analysis discussed by Game is that much GIS data are publicly available without cost, at high frequency and high degrees of spatial resolution for basically all regions in all countries of the world. This helps overcome the challenges that otherwise constrain impact assessments resulting from a lack of data, particularly in many developing countries. Another benefit of GIS data analysis is that it enables more direct assessments of an intervention. With I–O and SAM-based employment multiplier analysis, for example, an investment project is typically represented in a highly stylized way, embodied as final demand expenditures distributed across industries, but without reference to the project's specific location within a country and without unfolding time dimensions. Moreover, these analyses typically only assess employment impacts during the construction phase of the project, rather than the longer-term impacts after completion of the project, which provide the main rationale for infrastructure investments. Compared to RCTs,

44 For more on the STRENGTHEN2 project, see ILO (2024).

another benefit of GIS data analysis is that it can be done relatively quickly and at low cost, and does not require designing and undertaking baseline surveys prior to the intervention.

This is not to say that GIS data analysis does not pose other challenges. Notably, the most direct way of assessing employment impacts using GIS data analysis is by matching GIS data with LFS or other survey data that are geo-referenced with high granularity (such as at the household level), enabling the assessment of not just the quantity but multiple dimensions of the quality of employment – such as wages and working time, as well as breakdowns by gender, age group, educational attainment, employment status, sector and occupation. While LFS data are typically collected with geo-referenced coding, this coding is generally not publicly available because of concerns about survey respondents' confidentiality, though this is possible to address through engagement with countries' statistical agencies (for example, Game, Kucera and Neza 2025; Game, Dotse-Gborgbortsi and Roeland, forthcoming). LFS data also need to be available with sufficient regularity both before and after the intervention to effectively assess employment impacts. Yet, quarterly and even annual collection of such data is not established practice in many developing countries. Finally, even when LFS data satisfy these time-related criteria, our experience, in some cases, has been that apparent measurement errors can impede the analysis of certain aspects of employment.

This chapter uses two types of GIS data. First, the chapter uses nighttime lights (NTL) data in difference-in-difference (DID) econometric analysis to assess the impacts of investments in road improvements within transport corridors in Kenya and Zambia on NTL and, in turn and less directly, on local GDP and employment. As the NTL data we use are available at high frequency (monthly) and high geographic precision (at the level of light pixels), we can directly assess how these impacts play out over time after and at a distance from these projects upon their completion. Second, the chapter uses spatial data to conduct accessibility analysis, which provides estimates of changes in travel time to social infrastructure – that is, healthcare facilities and schools – as a result of these road improvement investments.[45] By looking at outcomes on both employment and access to social infrastructure, this chapter also aims to contribute to the work on impact assessments in support of the UN initiative titled "Global Accelerator on Jobs and Social Protection for Just Transitions", with its ambitious goals of helping countries to create 400 million decent jobs and to extend social protection coverage to the 4 billion uncovered.[46] Relevant in this regard is that the ILO's definition of the social protection floor includes "access to essential healthcare and basic income security" (ILO 2021, 4).

> Much GIS data are publicly available without cost, at high frequency and high degrees of spatial resolution for basically all regions in all countries of the world.

While the interpretation of results on travel time to social infrastructure are relatively straightforward, those based on NTL data merit some reflection. NTL data were shown to be a useful proxy for GDP growth in Henderson, Storeygard and Weil (2012). Since then, NTL data have continued to be used as a proxy for GDP as well as for electrification, urbanization and public expenditure (see Asher et al. 2021, 848). In their research on India, Asher et al. extend this analysis to include employment, among other variables, which they summarize as follows: "Our results confirm that night-lights are a highly statistically significant log-linear proxy for a range of development outcomes – population, employment, per capita consumption, and electrification – at a very narrow geographical level" (Asher et al. 2021, 848). Asher et al. also note two fundamental caveats on this finding. First, that NTL data have independent variation with each of these variables, and thus it is difficult to disentangle which of them are proxying for in a

45 See Game and Kang (2023) for a study undertaking both analyses for rural feeder roads in Rwanda as part of the STRENGTHEN2 project.

46 For more information on the Global Accelerator, see Global Accelerator on Jobs and Social Protection for Just Transitions.

specific context in the absence of corroborating information. Second, the estimated strength of the relationships between NTL data and the different development outcomes they assess differs widely between cross-sectional and time series variation, as well as by levels of geographic aggregation. In short, these estimated relationships, expressed as elasticities, tend to be larger cross-sectionally than over time as well as for larger geographic units. These estimated relationships are also generally larger in urban areas and in electrified versus non-electrified rural areas. Considering this, the authors urge "extreme caution" in inferring the strength of relationships between NTL data and development outcomes, employment not least of them (Asher et al. 2021, 848).

In light of the second of these concerns, our estimates of the impacts on NTL of investments in road improvements within transport corridors in Kenya and Zambia focus narrowly on variation over time entirely within small administrative units. While it is not evident that focusing on such variation represents truer relationships, it at least seems to provide relatively conservative estimates, erring on the side of caution.[47] Yet, because of data availability constraints, the GDP and employment data we use for Kenya and Zambia are for larger geographic units, and we address the possible implications of this mismatch in section 5.6.

Before turning to the analytical core of our chapter, it is worth considering some of the hypothesized causal channels – positive and negative – by which investments in roads can impact development outcomes, including employment. Here, we draw on relevant points from the "conceptual framework" developed by Asher and Novosad (2020). Though the focus of their discussion is the effects of new rural feeder roads on rural villages, many of the same considerations apply regarding the effects on adjacent areas of investments in road improvements within transport corridors running through predominately rural areas, as per the projects we assess in Kenya and Zambia.

The main initial impact of new or improved roads is to reduce transport costs. At least from the viewpoint of villages in India, Asher and Novosad argue that this is likely to lead to "higher wages, lower prices for imported goods, and higher prices for exported goods" (Asher and Novosad 2020, 800). The effects of these changes on village production and employment are ambiguous and depend on how these changes affect local production and play out among different imported and exported goods. Lower transport costs and shorter time to markets could result in increases in production, jobs and incomes, and indeed these positive effects are emphasized in advocating for investments in new or improved roads. Yet, higher wages could result in lower demand for labour, both through lower production and shifts towards less labour-intensive products or production methods. There are several contestable assumptions underlying these hypothesized causal channels and how they vary in different contexts, regarding:

- the workings of price and wage determination;
- the extent of reliance on wage labour; and
- the availability of viable alternative production methods.

Yet, even leaving these dynamics aside, lower transport costs could enable workers to more feasibly commute to jobs in areas farther afield, while readier access to higher wage jobs – such as in more urbanized areas – could lead workers to migrate outright. Depending on the relative strength of these and countervailing effects, this could cause investments in new or improved roads to result in lower economic activity and employment in areas adjacent to these roads. An additional complicating factor is that these different causal mechanisms can play out over different time frames, with the positive impacts being perhaps more immediate and the negative impacts requiring more time to unfold.

Most studies of the impact of investments in roads and transport show positive effects on development outcomes (see Berg et al. 2015; Asher and Novosad 2020). These studies almost invariably take some measures to address the issue of non-random placement of road investments – that is, endogeneity –, which can result in biased estimates of the impact of road investments. The question is the extent to which these measures adequately account for non-random placement, an issue we return to section 5.4.

47 This is also confirmed by comparing our estimates on NTL at the administrative unit level versus the smaller light pixel level, as described below.

5.2. Project descriptions

5.2.1. Kenya corridor road improvement project

The Isiolo-to-Moyale transport corridor aims to provide a vital transportation and trade link between Mombasa Port in Kenya and Addis Ababa in Ethiopia. The Isiolo-to-Moyale corridor forms part of the Trans East African Highway corridor running from Cairo (Egypt) to Cape Town (South Africa), as well as a part of the LAPSSET corridor, an ongoing project aiming to link Ethiopia, Kenya and South Sudan. Road improvement investments in the Isiolo-to-Moyale corridor were financed for a total of €320 million, with funding provided by the AfDB, the EU and the Government of Kenya. The Isiolo-to-Moyale corridor is comprised of four sections (or "lots") of road. Table 5.1 provides information on their length, date of completion and funding sources. The Merille–Marsabit section (lot 2) was co-funded by the EU, with AfDB co-funding the remaining three sections (lots 1, 3 and 4). The EU provided a grant of €85.2 million for this section of project. Under this grant, the corresponding section of road was upgraded to include 10 bridges, 83 box culverts, 72 cross pipe culverts, 2.9 million m^3 of excavation and fill, 29,000 m^3 of concrete, 893 tonnes of structural steel, 315,000 m^3 of subbase, 295,000 m^3 of crushed stone base and 50,500 m^3 of asphalt.

Due to the close timing of the completion of the investments (between March 2015 and December 2016) and their similar characteristics, road improvement investments in three sections of the of road (lots 2, 3 and 4) were considered together as part of the treatment area, which comprise a total length of 363 kilometres. As one road section (lot 1) was completed much earlier (in July 2011) and fell outside the period of available data, it was included in the analysis but as part of the non-treatment area.

5.2.2. Zambia corridor road improvement project

The Nacala Road Corridor Project (NCRP) encompasses 1,033 kilometres of roads in Malawi, Mozambique and Zambia. The NCRP also feeds into the Great East Road Rehabilitation Programme, which involves the rehabilitation of 360 kilometres of highway between Luangwa in Zambia and Mwami at the Malawi border. The overall objectives of the NCRP are to reduce poverty and promote economic growth and regional integration. More specifically, the NCRP aims to improve:

- Malawi, Mozambique and Zambia's transport links to the port of Nacala in Mozambique;
- transport services by reducing transport costs as well as delays at border crossings;
- access to markets and social services;
- the sustainability of investments by controlling axle loads.

As of 2023, different phases of the project remained under implementation.

The road works are divided across three phases of the project, as described in table 5.2, which provides the length of the road sections, their date of completion and funding sources. Phase 1 consists of the improvement of 361 kilometres of road in Malawi and Mozambique, phase 2 of 360 kilometres of road in Zambia, and phase 3 of 175 kilometres of road in Malawi and Mozambique along with two single-border posts. Our assessment focuses on phase 2 of the project, which was financed for the equivalent of about US$70 million[48] and

▶ **Table 5.1. Kenya: Project information on the Isiolo-to-Moyale corridor, by road section**

Road section	Length (km)	Completion date	Financing
Lot 1 (Isiolo to Merille)	137	July 2011	AfDB and Government of Kenya
Lot 2 (Merille to Marsabit)	120.6	December 2016	EU and Government of Kenya
Lot 3 (Marsabit to Turbi)	121	March 2015	AfDB and Government of Kenya
Lot 4 (Turbi to Moyale)	121	September 2016	AfDB and Government of Kenya

Source: Government of Kenya (2017).

48 Based on the exchange rate of 1 AfDB unit of account (UA) to US$1.33 as of January 2024.

▶ Table 5.2. Zambia: Project information on the Nacala Road Corridor Project, by phase

Phase	Length (km)	Completion date	Financing
Multinational – phase 1 (Loan to Mozambique and Malawi)	361	Ongoing (planned completion 2026)	AfDB, Governments of Malawi and Mozambique
Multinational – phase 2 (Loan to Zambia)	360	December 2017	AfDB and Government of Zambia
Multinational – phase 3 (Loan to Mozambique)	175	December 2024	AfDB and Government of Mozambique

Source: AfDB (2024).

was completed in December 2017. Two additional phases (4 and 5) are currently ongoing and provide supplementary funding and trade facilitation. In addition to investments in road improvements were investments in market sheds, community boreholes, capacity development, HIV/AIDS and tuberculosis awareness, tree planting and compensation for project affected persons.

The NCRP led to an increase in employment and income during the construction and maintenance phases. During the construction phase, the project engaged 360 unskilled labourers on average – of which just over 8 per cent were women, below the project target of 20 per cent. Other economic activities – such as provision of food for construction workers, hospitality services and roadside vending – provided additional income for communities along the project route (AfDB 2017).

5.3. Data

GIS and remotely sensed satellite data were downloaded from different sources, then processed and combined as follows.

5.3.1. Treated and untreated roads

For Kenya, the implemented road project passes through three counties in the north of the country: Isiolo, Marsabit and Samburu, which comprise the study area of the analysis. The treatment area consists of administrative units in these three counties within 2.5 kilometres of the three improved sections of road. The non-treatment, control area consists of other administrative units in these three counties that were further afield from the improved sections of road, as shown in figure 5.1. For Zambia, the implemented road project passes through the Eastern province of the country, comprising the study area for the analysis. The treatment area consists of administrative units in the Eastern province within 2.5 kilometres of the section of road improved during phase 2 of the project. The non-treatment, control area consists of other administrative units that were not within 2.5 kilometres of the improved sections of road, as shown in figure 5.2. For both Kenya and Zambia, these administrative units are at the administrative level 3, the smallest administrative unit for which data were available. As noted below, the threshold of 2.5 kilometres follows the method of Mitnik, Sanchez and Yañez-Pagans (2018), though we also vary this using pixel-level data this to consider impacts over distances between 1 and 5 kilometres of treated roads.

5.3.2. Nighttime lights

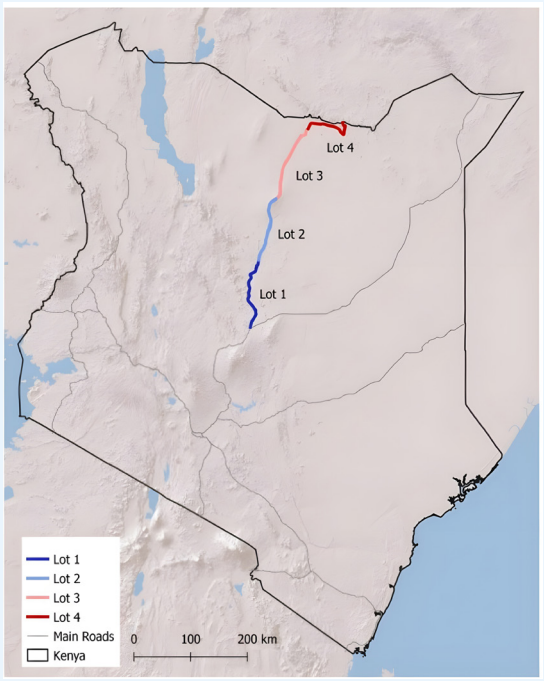
Monthly NTL data from NASA's state-of-the-art visible infrared imaging radiometer suite (VIIRS) day–night band instrument were used as the main dependent variable. Compared to other sources of NTL data, the VIIRS data are notable for their high resolution and frequency. NTL data were obtained at monthly intervals at the pixel level from 2012 to end of 2020 for Kenya and from 2015 to end of 2020 for Zambia, with each pixel measuring approximately 450 m × 450 m.[49]

5.3.3. Additional data

Additional GIS data were used as control variables, consistent with prior studies (for example, Asher and Novosad 2020; Mitnik, Sanchez and Yañez-Pagans 2018). All data were processed at a spatial

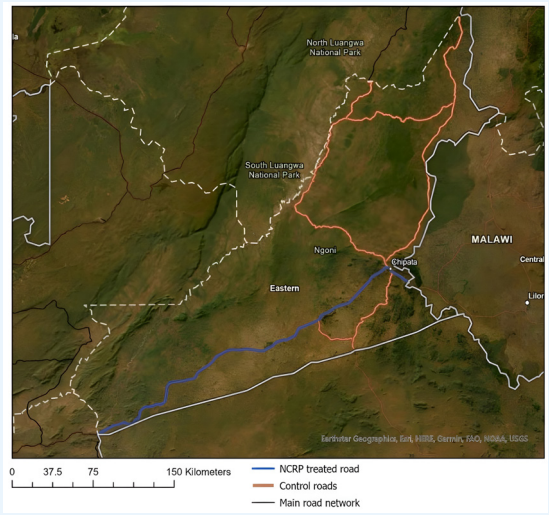
49 Due to the large number of zero NTL values in the pixel-level data – a result of the rural characteristics of the study area –, the inverse hyperbolic sine transformation was applied to the brightness values, following Mitnik, Sanchez and Yañez-Pagans (2018).

▶ **Figure 5.1. Kenya: Treatment and control roads used in the study**



Source: Main roads: OpenStreetMap database; country boundaries: GADM database.

▶ **Figure 5.2. Zambia: Treatment and control roads used in the study**



Source: Main roads: OpenStreetMap database; country boundaries: GADM database

resolution of approximately 450 m × 450 m to match the resolution of the NTL pixel-level data. To control for the expected positive effect of population on NTL, annual gridded population estimates from Worldpop were used (Bondarenko et al., 2020). To control for the expected negative effect of conflicts on NTL, annual data on locations of conflicts were obtained from the Armed Conflict Location and Event Data Project, which provides data on characteristics of political violence events, demonstrations and other non-violent but politically relevant developments (ACLED, n.d.; Raleigh, Kishi and Linke 2023). These data were filtered to include larger-scale conflicts that could have impacted lights, including those classified as explosions or riots. To control for the expected positive effect of agricultural productivity on NTL, the annual normalized difference vegetation index (NDVI) was used (LAADS, n.d.). The presence of other infrastructure investments in the study area during the period of the analysis was researched. While some projects that fell within the study area were present, none were completed during the period of analysis and were therefore not controlled for.

Additional data sources were used to convert NTL into GDP and employment. For Kenya, country-wide annual GDP at the county level and employment data at the much more aggregate country level are from the Kenya National Bureau of Statistics. For Zambia, country-wide annual GDP and employment data at the provincial level are from ZamStats. Note that the county level for Kenya and provincial level for Zambia are considerably larger than the administrative level 3 data used for estimating the impact of the road investments on NTL, but these are the smallest geographic units for which such data are available. Indeed, employment data are only available at the country level for Kenya. Some of the potential implications of these mismatches in levels of aggregation are addressed in section 5.6.

5.3.4. Descriptive statistics

For Kenya, table 5.3 provides descriptive statistics for each of the variables included in the analysis of NTL at the administrative level 3, spanning the years 2012–14, prior to the completion of any

of the sections of the road. Neither treated nor untreated areas had large conflicts for the years shown in the table, though such conflicts started after the completion of the investment project in both treated and untreated areas that fall within the period assessed. Treated areas had a slightly larger population and considerably higher NTL luminosity (about 2.4 times higher) than untreated areas. For Zambia, table 5.3 follows the same format as for Kenya, though spanning the years 2015–17, prior to the completion of phase 2 of the investment project. There were somewhat more large conflicts in the treated areas than in untreated areas. As with Kenya, treated areas had a slightly larger population and much higher NTL luminosity (about 5.5 times higher) than untreated areas.

These differences in NTL luminosity are indicative of the non-random placement of the investments in road improvement. Insofar as treated areas were growing faster than non-treated areas, this suggests that estimates of the impact of the road investments on NTL (and subsequently on GDP and employment) may be biased upwards, overestimating the impact of these investments on economic activity variously defined. This is the case even though these investments were made within transport corridors excluding their endpoints. Such scenarios have been taken advantage of in the empirical literature as a means of addressing endogeneity, as will be discussed in section 5.4 (see Berg et al. 2015).

5.4. Methods

5.4.1. Econometrics

This analysis closely follows the methodology of Mitnik, Sanchez and Yañez-Pagans (2018) in their assessment of road improvement investments in Haiti. The authors estimated that these investments resulted in a 6-to-26-per-cent increase (depending on assumptions) in NTL and a corresponding 0.5 to 2.1 per cent increase in local GDP. They applied a DID approach at the community and pixel levels and estimated that the largest impacts were concentrated within 2 kilometres of the improved road. For Kenya and Zambia, we assess impacts at both the administrative level 3 and pixel levels, with a focus on how impacts vary over time after the completion of the projects as well as per the distance from the improved roads. Following Mitnik, Sanchez and Yañez-Pagans (2018), administrative units within 2.5 kilometres of treated and untreated

▶ Table 5.3. Summary statistics

Kenya, 2012–14

Treated areas

	Mean	Standard deviation
NTL luminosity	4.69	10.99
IHS of NTL luminosity	1.23	1.24
Conflicts	0.00	0.00
Population	9 109.43	6 458.82
NDVI	0.36	0.09

Untreated areas

	Mean	Standard deviation
NTL luminosity	1.97	6.92
IHS of NTL luminosity	0.59	0.93
Conflicts	0.00	0.00
Population	8 389.22	6 651.57
NDVI	0.34	0.14

Zambia, 2015–17

Treated areas

	Mean	Standard deviation
NTL luminosity	99.91	218.41
IHS of NTL luminosity	2.83	2.37
Conflicts	0.01	0.06
Population	18 248.24	15 092.08
NDVI	0.21	0.09

Untreated areas

	Mean	Standard deviation
NTL luminosity	18.08	65.67
IHS of NTL luminosity	1.08	1.77
Conflicts	0.00	0.01
Population	16 410.50	15 516.57
NDVI	0.24	0.12

Key: IHS = inverse hyperbolic sine transformation.

roads are used in benchmark regressions, with NTL pixels within administrative units summed to get total NTL brightness for each unit. The pixel-level analysis was performed to investigate how impacts vary over distance from improved roads, with distances up to 5 kilometres examined.

The equation below presents the general econometric specification that was applied:

$$Y_{i,t} = \alpha + \beta_1 Treated_i + \beta_2 X_{it} + \beta_3 X_{it-1} + \lambda_i + n_t + \epsilon_{i,t}$$

In this equation,

- Y is the NTL brightness for the administrative unit or pixel;
- $Treated$ is the treatment variable that has a value of 1 for the month and year the area received a road improvement and 0 otherwise;
- λ_i are administrative-unit (or pixel) fixed effects;
- n_t are monthly fixed effects;
- X_{it} are the unlagged control variables for population, the NDVI and conflicts; and
- X_{it-1} presents lagged control variables, where a lag of one year was tested, as per Mitnik, Sanchez and Yañez-Pagans (2018).[50]

Different specifications were run – starting from the most parsimonious form and then introducing fixed effects and finally control variables, which led to our preferred specification. Different specifications address different types of variation, with the parsimonious specification without fixed effects addressing overall variation, and with full fixed effects addressing variation over time and within administrative units (which, in the context of our method, is a form of DID estimation). Our preferred specification was run for each year after the completion of the investment projects, as a means of estimating variation in impacts over time.

A key challenge when assessing the impact of infrastructure projects is the non-random placement of road investments. This can result from economic and political factors, such as either higher-growth or lower-growth areas being favoured for road investments, leading to upwards or downwards biases on estimates of the impact of such investments because of such endogeneity. In their extensive survey of the related empirical literature, Berg et al. (2015) discuss several ways in which endogeneity has been addressed, two of which come into play in our analysis. First, by using administrative-unit fixed effects, we address aspects of non-random placement that can be considered fixed over time, as well as partly addressing omitted variable bias. Second, we assess economic corridors while excluding the endpoints of these corridors.

5.4.2. Translating nighttime lights data to GDP and employment

Following Henderson, Storeygard and Weil (2012), there is substantial literature that translates NTL into economic activity in the form of GDP by estimating the elasticity between NTL brightness and GDP. We apply this method to annual data at the county level for Kenya and the provincial level for Zambia. We then calculate the elasticity between GDP and employment using annual data at the national level for Kenya (for want of employment data at the county level) and provincial level for Zambia. We use two methods to calculate these elasticities: one based on regression analysis and the other based on average annual percentage changes in the ratios of NTL to GDP as well as GDP to employment. In their comparative analysis of different methods of calculating GDP to employment elasticities, Burgi, Hovhannisyan and Mondragon-Velez (2024) provide evidence that the second method has "superior... predictive power" (24). The elasticity between NTL and employment is calculated indirectly as the product of these two elasticities, as in Charpe (2022).[51] Taken together, these elasticities enable us to estimate the impact of investments in road improvements in the treated areas of the Kenyan and Zambian corridors on GDP and employment.

50 Given the possibility of the confounding effects of control variables in a DID context, we present results with and without these control variables, as noted below (see Zeldow and Hatfield 2021). Yet, at least in our context, there is only a slight difference in coefficient estimates on the treatment variable with and without these control variables, for both Kenya and Zambia.

51 Employment elasticities can also be calculated directly, as in Charpe (2022) and Game and Kang (2023). Here, the indirect calculation makes explicit the extent to which the different findings for Kenya and Zambia result from the NTL to GDP versus GDP to employment elasticities.

5.4.3. Access to social infrastructure

To analyse the impact of the road project on access to social infrastructure, including healthcare facilities and schools, travel time scenarios were simulated using the World Health Organization's AccessMod 5 (AccessMod 5, n.d.). AccessMod 5 is a software that measures physically accessibility to facilities, by combining and overlaying geospatial data and inputting travel information. The tool enables the user to calculate travel time by modelling scenarios of their choice. The mode of transport combining walking and driving was selected for this scenario, to study how travel time improved after the rehabilitation of the roads. AccessMod 5 calculated the least-cost path to facilities, considering the road network and terrain (land cover and elevation), which can affect travel speed. Physical barriers that cannot be crossed, such as rivers, are also factored into the model. A total travel time to facility of up to 30 minutes was set as the cut off for the analysis.

Different travel speeds were set based on road class (primary, secondary, tertiary and feeder road) and landcover type. A detailed breakdown of assigned speeds and associated classes are presented in table 5.4. Landcover speeds were based on Tobler's formula (Tobler 1993), which assumes a top walking speed of 5 kilometres per hour on a flat surface. Road travel speeds were taken from nationally set speed limits[52] and previous work looking at travel time to healthcare facilitates in sub-Saharan Africa (Bowry 2015). Two scenarios were modelled for investigating access to healthcare facilities and schools for both projects. The first scenario used the road network and travel speeds prior to the investment in road improvements, based on information collected in project documents recording transports speed along the roads. For the second scenario, after implementation of the projects, the assigned transport speeds along the roads were increased based on the new classification of the roads after being rehabilitated. The difference between the two scenarios was assessed.

▶ **Table 5.4. Travel speeds and categories used for calculating travel time to social infrastructure**

Land cover category	Travel speed (km/h)
Dense vegetation	2
Medium vegetation	3
Sparse vegetation	4
Bare ground	5
Water bodies	0

5.5. Results

5.5.1. Main results

Tables 5.5 and 5.6 present results on the estimated impact of road improvement investments in the Isiolo-to-Moyale transport corridor (lots 2, 3 and 4) in Kenya and the NCRP (phase 2) in Zambia, respectively. Column 1 shows the most parsimonious specification, column 2 adds administrative-unit fixed effects, column 3 adds monthly fixed effects, column 4 adds current control variables of population, NDVI and conflict, and column 5 adds in these control variables lagged one year. For the sake of concision, these tables show results for two years after the completion of the project. Though, as we will show, we also run these same specifications for one to four years after the completion of the project in Kenya and one to three years after the completion of the project in Zambia (with the fewer years for Zambia resulting from the late completion of the project up to the end of 2020).

Columns 3 through 5 focus on variation over time within administrative units, and thus provide us with the DID estimates that provide a measure of control for non-random placement of the road investments while also addressing omitted variable bias. Results for our preferred specification are shown in column 5, as in Mitnik, Sanchez and Yañez-Pagans (2018). In any case, the coefficient estimates on the treatment variable in columns 3 through 5 are all positive, of similar magnitude, and statistically significant at the level of 1 per cent.

For Kenya, the coefficient estimate from our preferred specification for two years after the completion of the project is 0.113. Exponentiating this estimate (exp(X)–1) suggests that the investment in road improvement resulted in a 12.0-per-cent increase in NTL. The comparable percentage

52 Zambia, Statutory Instrument No. 90 of 2016, *The Road Traffic (Speed Limits) Regulations, 2016.* https://www.rtsa.org.zm/wp-content/uploads/2019/09/SI-No-90-of-2006-Speed-Limits.pdf.

▶ **Table 5.5. Kenya: Administrative-level treatment effect, two years after project completion**

Variables	1 OLS	2 Fixed effects	3 Fixed effects	4 Fixed effects	5 Fixed effects
treatment	0.500***	0.400***	0.117***	0.134***	0.113***
	0.059	0.033	0.035	0.036	0.035
pop				0.00003**	0.00003
				0.00001	0.00001
pop *t*–1					0.00001
					0.00001
ndvi				–2.111***	–2.103***
				0.373	0.373
ndvi *t*–1					–0.835***
					0.305
conf				–0.074	–0.055
				0.152	0.157
conf *t*–1					–0.017
					0.147
Observations	7.476	7.476	7.476	7.476	6.408
Adjusted *R*-squared	0.03	0.88	0.89	0.89	0.88
Admin. area fixed effects	No	Yes	Yes	Yes	Yes
Monthly fixed effects	No	No	Yes	Yes	Yes
Lagged covariates	No	No	No	No	*t*–1

Key: * = robust standard error $p<0.1$; ** = robust standard error $p<0.05$; *** = robust standard error $p<0.01$; conf = conflict; pop = population; OLS = ordinary least squares; *t*–1 = lagged by one year.

increases from one to four years after project completion are shown in a bar graph in figure 5.3. These show an overall increase in NTL as a result of the investment in road improvement ranging from 11.6 per cent for one year after project completion to 30.9 per cent for four years after project completion (with a slight dip three years after project completion).

For Zambia, the coefficient estimate from our preferred specification for two years after the completion of the project is considerably larger than for Kenya, at 0.246. Exponentiating this estimate suggests that the investment in road improvement resulted in a 27.9 per cent increase in NTL. The comparable per cent increases from one to three years after project completion are shown in a bar graph in figure 5.4. These show an overall increase in NTL as a result of the investment in road improvement ranging from 4.3 per cent for one year after project completion to 43.2 per cent for three years after project completion.

5.5.2. Pixel-level results

Following Mitnik, Sanchez and Yañez-Pagans (2018), our benchmark parameters – two years after treatment and within 2.5 kilometres of treated and untreated roads – were also used at the highly-focused pixel level, with pixel-level (rather than administrative-unit) fixed effects. Mitnik, Sanchez and Yañez-Pagans discuss their rationale for doing so, while also qualifying that these estimates are not meant as substitutes for analysis at the administrative unit level, given the highly constrained geographic focus when looking only at changes within pixels over time. They write:

> We do not see this exercise as a way to estimate changes in economic activity at the pixel level, since nightlights might not be appropriate proxies for GDP for very small areas. Rather, the analysis gives us as a way to explore whether luminosity impacts are concentrated only around the intervened roads or not, and how far away from the roads the impacts might materialize. (Mitnik, Sanchez and Yañez-Pagans 2018, 15)

From the perspective of policy design, knowing how the impacts of investments in road improvements vary not only over time but also over distance is particularly useful in understanding the impacts on intended beneficiaries.

Results for Kenya and Zambia are shown in table 5.7, with the five columns showing the estimated impact of the investments in road improvement on NTL at increments of 0–1 km, 1–2 km, 2–3 km, 3–4 km and 4–5 km. For Kenya, the largest positive coefficient estimates on the treatment variable are for the distance of 0–1 km, at 0.031. The estimate falls off considerably for the distance 1–2 km, to 0.012, though both estimates are statistically significant at the level of one per cent. This result is broadly similar to Mitnik, Sanchez and Yañez-Pagans (2018) for Haiti. However, in the case of Kenya, the estimates on the treatment variable actually become negative for distance increments beyond 2 kilometres and statistically significant at the level of one per cent for increments of 2–3 km and 3–4 km (10 per cent for 4–5 km), though these are very small in magnitude.

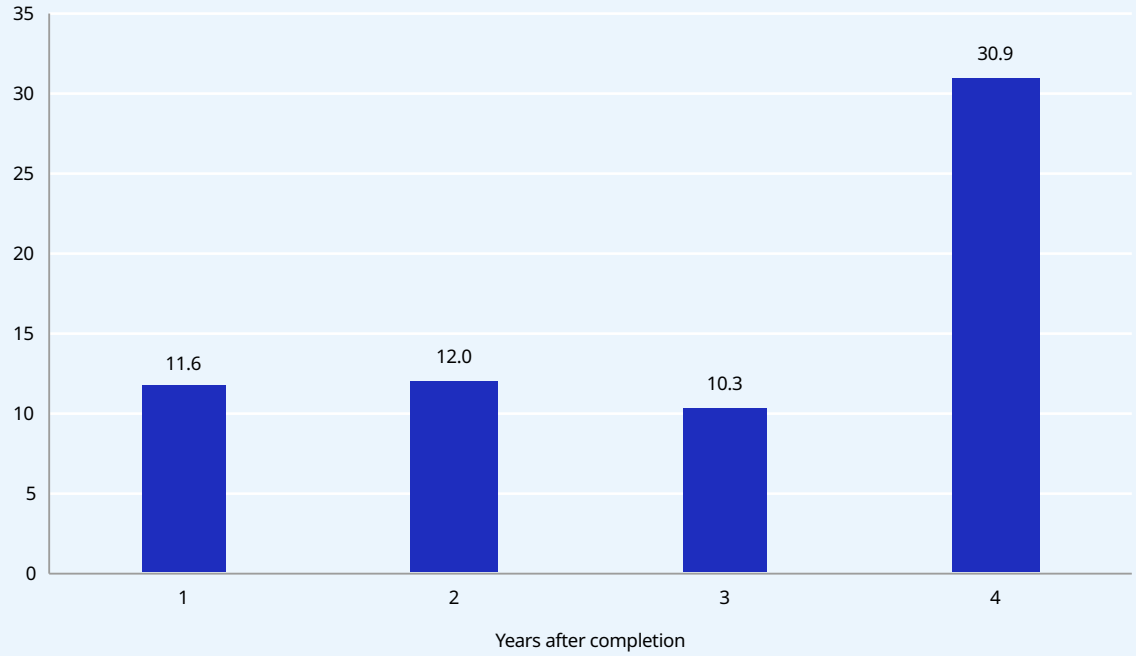
For Zambia, the coefficient estimates on the treatment variable are all very small but nonetheless positive and statistically significant at the level of 1 per cent for all five distance increments. Indeed, the estimate is only slightly smaller at the 4–5 km than 0–1 km increment (0.006 and 0.008, respectively).

▶ **Table 5.6. Zambia: Administrative-level treatment effect, two years after project completion**

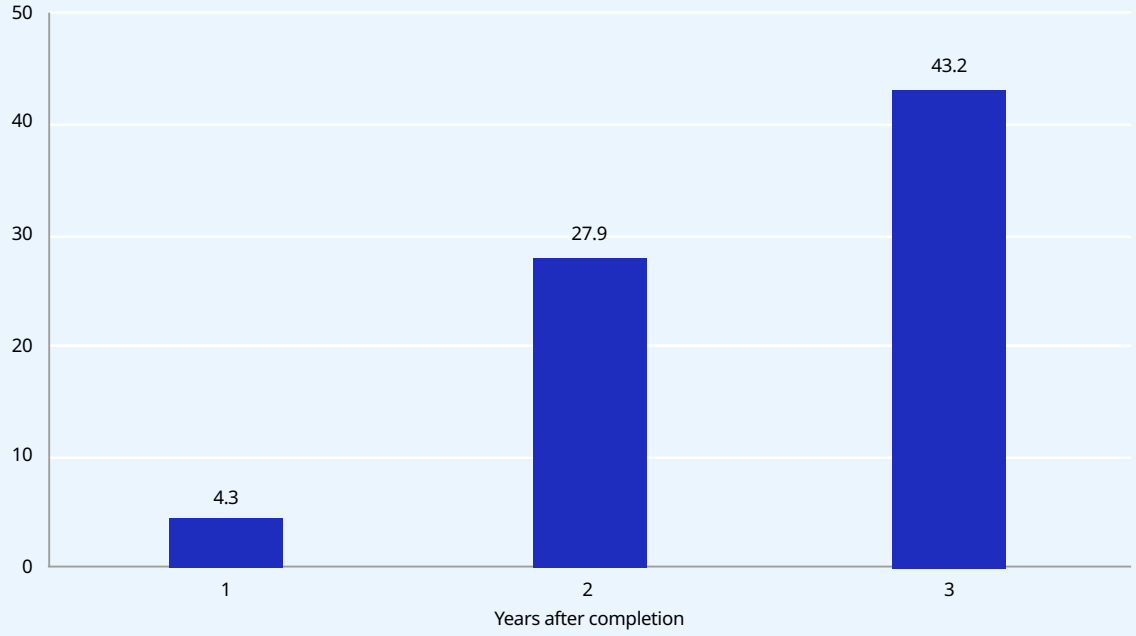
	1	2	3	4	5
Variables	**OLS**	**Fixed effects**	**Fixed effects**	**Fixed effects**	**Fixed effects**
treatment	–1.019***	–0.028	0.238***	0.237***	0.246***
	–0.061	–0.028	–0.042	–0.042	–0.046
pop				0.021*	0.023
				–0.009	–0.021
pop *t*–1					–0.001
					–0.018
ndvi				0.106	0.133
				0.009	0.113
ndvi *t*–1					0.089
					0.073
conf				–0.156	0.029
				0.195	–0.099
conf *t*–1					–0.277**
					–0.114
Observations	5.640	5.640	5.640	5.640	4.512
Adjusted *R*-squared	0.03	0.88	0.89	0.89	0.88
Admin. area fixed effects	No	Yes	Yes	Yes	Yes
Monthly fixed effects	No	No	Yes	Yes	Yes
Lagged covariates	No	No	No	No	*t*–1

Key: * = robust standard error $p<0.1$; ** = robust standard error $p<0.05$; *** = robust standard error $p<0.01$; conf = conflict; pop = population; OLS = ordinary least squares; *t*–1 = lagged by one year.

▶ **Figure 5.3. Kenya: Estimated change in NTL from investments in road improvements**
(percentage change)



▶ **Figure 5.4. Zambia: Estimated change in NTL from investments in road improvements**
(percentage change)



▶ Table 5.7. Pixel-level results

Kenya	0–1 km	1–2 km	2–3 km	3–4 km	4–5 km
Treatment	0.031***	0.012***	-0.006***	-0.009***	-0.002*
	0.001	0.001	0.000	0.000	0.001
Observations	724 684	706 225	702 984	684 797	661 495
R-squared	0.83	0.85	0.97	1.00	0.98
Pixel fixed effects	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes

Zambia	0–1 km	1–2 km	2–3 km	3–4 km	4–5 km
Treatment	0.008***	0.005***	0.007***	0.004***	0.006***
	0.001	0.000	0.000	0.000	0.000
Observations	1 110 456	1 094 344	1 067 102	1 046 856	1 032 334
R-squared	0.92	0.91	0.87	0.80	0.85
Pixel fixed effects	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes

Key: * = robust standard error $p<0.1$; ** = robust standard error $p<0.05$; *** = robust standard error $p<0.01$.

5.5.3. Nighttime lights, (local) GDP and employment

The regression-based elasticities between NTL and GDP are shown in table 5.8. For Kenya, it uses country-wide annual county-level data (with county and annual fixed effects) and for Zambia, it uses country-wide annual provincial-level data (with province and annual fixed effects). For Kenya, the NTL–GDP elasticity is 0.424, and for Zambia it is 0.489, with both statistically significant at the level of one per cent. These elasticities are very similar to those of Beyer, Hu and Yao (2022, 13) using the same high-quality VIIRS data set with quarterly country-level data (in regressions with country and quarter fixed effects) for a sample of 84 emerging and low-income countries, for which the authors provide an estimate of 0.513.

Taking these results at face value, for Kenya, we multiplied the (county-level) NTL–GDP elasticity with the (administrative-unit level) estimates on the treatment variable, then exponentiated. This suggests that road improvement investment in the Isiolo-to-Moyale transport corridor resulted in between a 4.8- and 12.1-per-cent increase in local GDP – for one and four years, respectively, after the completion of the project – in the administrative units within 2.5 kilometres of the project. For Zambia, this same exercise suggests that the road improvement investments in the NCRP transport corridor resulted in between a 2.1- and 19.2-per-cent increase in local GDP – for one and three years, respectively, after the completion of the project – in the administrative units within 2.5 kilometres of the project.

Moving to employment, the regression-based elasticities between GDP and employment (Emp) are shown for Kenya using country-wide annual *country-level* data (with country and annual fixed effects) and for Zambia using country-wide annual *provincial-level* data (with province and annual fixed effects) in table 5.9. For Kenya, the GDP–employment elasticity is 0.317, and for Zambia it is 0.552, with the former statistically significant at the level of 5 per cent and the latter at the level of 10 per cent. We should caution, though, that the GDP–employment elasticities for Kenya are based on only 13 observations. For Kenya, multiplying the NTL–GDP elasticity with the GDP–employment elasticity yields an indirect NTL–employment

▶ **Table 5.8. Elasticity between nighttime lights and GDP, annual fixed effects**

Kenya: County-level data	
	ln(GDP)
ln(NTL)	0.424***
	0.022
Observations	329
R-squared	0.99

Zambia: Provincial-level data	
	ln(GDP)
ln(NTL)	0.489***
	0.138
Observations	50
R-squared	0.97

Key: *** = robust standard error $p<0.01$.

▶ **Table 5.9. Elasticity between employment and GDP, annual fixed effects**

Kenya: National-level data	
	ln(Emp)
ln(GDP)	0.317**
	0.136
Observations	13
R-squared	0.33

Zambia: Provincial-level data	
	ln(Emp)
ln(GDP)	0.552*
	0.308
Observations	50
R-squared	0.965

Key: * = robust standard error $p<0.1$; ** = robust standard error $p<0.05$.

elasticity of 0.134; for Zambia, it yields an indirect NTL–employment elasticity of 0.270.

For Kenya, multiplying the regression-based NTL–employment elasticity with the estimates on the treatment variable and exponentiating suggests that the project resulted in between a 1.5- and 3.6-per-cent increase in employment – for one and four years, respectively, after the completion of the project – in the administrative units within 2.5 kilometres of the project. For Zambia, this same exercise suggests that the project resulted in between a 1.1- and 10.2-per-cent increase in employment – for one and three years, respectively, after the completion of the project – in the administrative units within 2.5 kilometres of the project.

By way of summary, the full set of estimated percentage changes in NTL, local GDP and employment resulting from the investments in road improvements in the respective corridors in Kenya and Zambia are shown in table 5.10. While the left-hand side of the table shows percentage changes based on regression elasticities, the right-hand side shows comparable results with elasticities based average annual percentage changes in the ratios of NTL to GDP along with GDP to employment, as recommended by Burgi, Hovhannisyan and Mondragon-Velez (2024). For Kenya, these alternative elasticities result in considerably higher estimated percentage changes in GDP – between a 7.1- and 18.2-per-cent increase in local GDP for one and four years, respectively, after the completion of the project – and especially for employment – between a 5.4- and 13.8-per-cent increase in employment for one and four years, respectively, after the completion of the project. For Zambia, the alternative elasticities result in slightly higher estimated percentage changes in GDP – between a 2.6- and 24.4-per-cent increase in local GDP for one and three years, respectively, after the completion of the project – but estimated percentage changes for employment are nearly identical between the two methods of constructing elasticities. Note that the large increase over time in the estimated impacts on GDP and employment are driven by the estimated impacts on NTL, as shown in figures 5.3 and 5.4. Taking these results at face value suggests that the main benefits of these transport corridor investments kicked in well after the completion of these projects.

▶ **Table 5.10. Estimated percentage changes in nighttime lights, local GDP and employment after investments in road improvements in Kenya and Zambia**

Based on regression elasticities			
	Time after completion	Kenya	Zambia
NTL	1 year	11.6	4.3
	2 years	12.0	27.9
	3 years	10.3	43.2
	4 years	30.9	N/A
Local GDP	1 year	4.8	2.1
	2 years	4.9	12.8
	3 years	4.2	19.2
	4 years	12.1	N/A
Employment	1 year	1.5	1.1
	2 years	1.5	6.9
	3 years	1.3	10.2
	4 years	3.7	N/A

Based on percentage change ratio elasticities			
	Time after completion	Kenya	Zambia
Local GDP	1 year	7.1	2.6
	2 years	7.3	16.1
	3 years	6.3	24.4
	4 years	18.2	N/A
Employment	1 year	5.4	1.1
	2 years	5.6	6.7
	3 years	4.8	9.9
	4 years	13.8	N/A

Key: N/A = not applicable.

5.5.4. Access to social infrastructure

The analysis of travel time to social infrastructure estimates the change in the share of the total population who are able to travel to healthcare facilities and schools within two time bands, 0–15 and 15–30 minutes, as a result of the investments in road improvements along transport corridors in Kenya and Zambia. Results are broken down geographically at the constituency level for Kenya and the district level for Zambia, which are larger than the administrative level 3 units used for the NTL analysis but smaller than the county and province level units for Kenya and Zambia, respectively, that were used for the elasticities analysis. Travel times within 30 minutes were selected as they are a significant determinant of health outcomes and are often used in healthcare accessibility analysis (Banke-Thomas et al. 2021; Delamater et al. 2012). Likewise, a 30-minute travel time to school is a policy-relevant threshold for learning outcomes (Afoakwah and Koomson 2021). The travel time band of 0–15 minutes was included in the analysis since changes within the 30-minute threshold are often driven by changes within the 0–15-minute time band. Using these dual time bands can sometimes result in a decrease in population coverage within the 30-minute threshold time due to the bands widening geographically in the post–road improvement scenarios, in which people previously within the 15–30-minute time band now fall into the 0–15-minute time band. As such, we focus more on the 0–15-minute time band in discussing our results, though results for both time bands are presented.

For Kenya, before the road improvements, an average of 44 per cent of the population across constituencies was within 15 minutes of travel to the nearest healthcare facility and 63 per cent within 30 minutes of travel. After the improvements, this increased by an average of 0.5 percentage points for the 0–15-minute time band. The biggest improvement was in the Saku constituency, where the share of the population within 15 minutes of the nearest healthcare facility is estimated to have increased by 3.2 percentage points, as shown in figure 5.5.[53]

53 For Kenya, there was a smaller number of constituencies included in the analysis of access to healthcare facilities compared to schools, as several constituencies did not have a healthcare facility within a 30-minute travel time.

For Zambia, before the road improvement, an average of 39 per cent of the population was within 15 minutes of travel to the nearest healthcare facility and 78 per cent within 30 minutes of travel. After the improvements, this increased by an average of 0.6 percentage points for the 0–15-minute time band. The biggest improvement was in the Nyimba district, where the share of the population within 15 minutes of the nearest health facility is estimated to have increased by 2.2 percentage points, followed by Sinda with an increase of 2.0 percentage points, as shown in figure 5.6.

For Kenya, data on school education levels broken down by primary and secondary are not provided in the school data. Therefore, the coverage of school-age children within 0–15- and 15–30-minute time bands to primary and secondary schools combined was assessed. Before the road improvements, 81 per cent of the population across constituencies was within 15 minutes of travel time to the nearest school and 86 per cent within 30 minutes. After the improvements, this increased marginally by an average of 0.1 percentage points for the 0–15-minute time band. The biggest improvement was in the Moyale constituency, where the share of the population within 15 minutes of the nearest school is estimated to have increased by 0.5 percentage points, as shown in figure 5.7.

For Zambia, school data were available with primary and secondary breakdowns, so the analysis was run for both types of schools. Before the road improvements, 27 per cent of the population across districts was within 15 minutes of travel time to the nearest primary school and 52 per cent within 30 minutes. After the improvements, this increased only marginally, by an average of 0.2 percentage points for the 0–15-minute time band. The biggest improvement was in the Nyimba district, where the share of the population within 15 minutes of the nearest primary school is estimated to have increased by 0.9 percentage points, as shown in figure 5.8.

For access to secondary schools in Zambia, before the road improvements, 12 per cent of the population across districts was within 15 minutes of travel time to the nearest secondary school and 24 per cent within 30 minutes. After the improvements, this increased by an average of 0.6 percentage points for the 0–15-minute time band. The biggest improvement was in the Chipata district, where the share of the population within 15 minutes of the nearest secondary school is estimated to have increased by 2.7 percentage points, as shown in figure 5.9. However, we also see sizeable improvements in access to secondary schools for the 15–30-minute time band for two districts, Kasenengwa by 2.5 and Sinda by 1.9 percentage points.

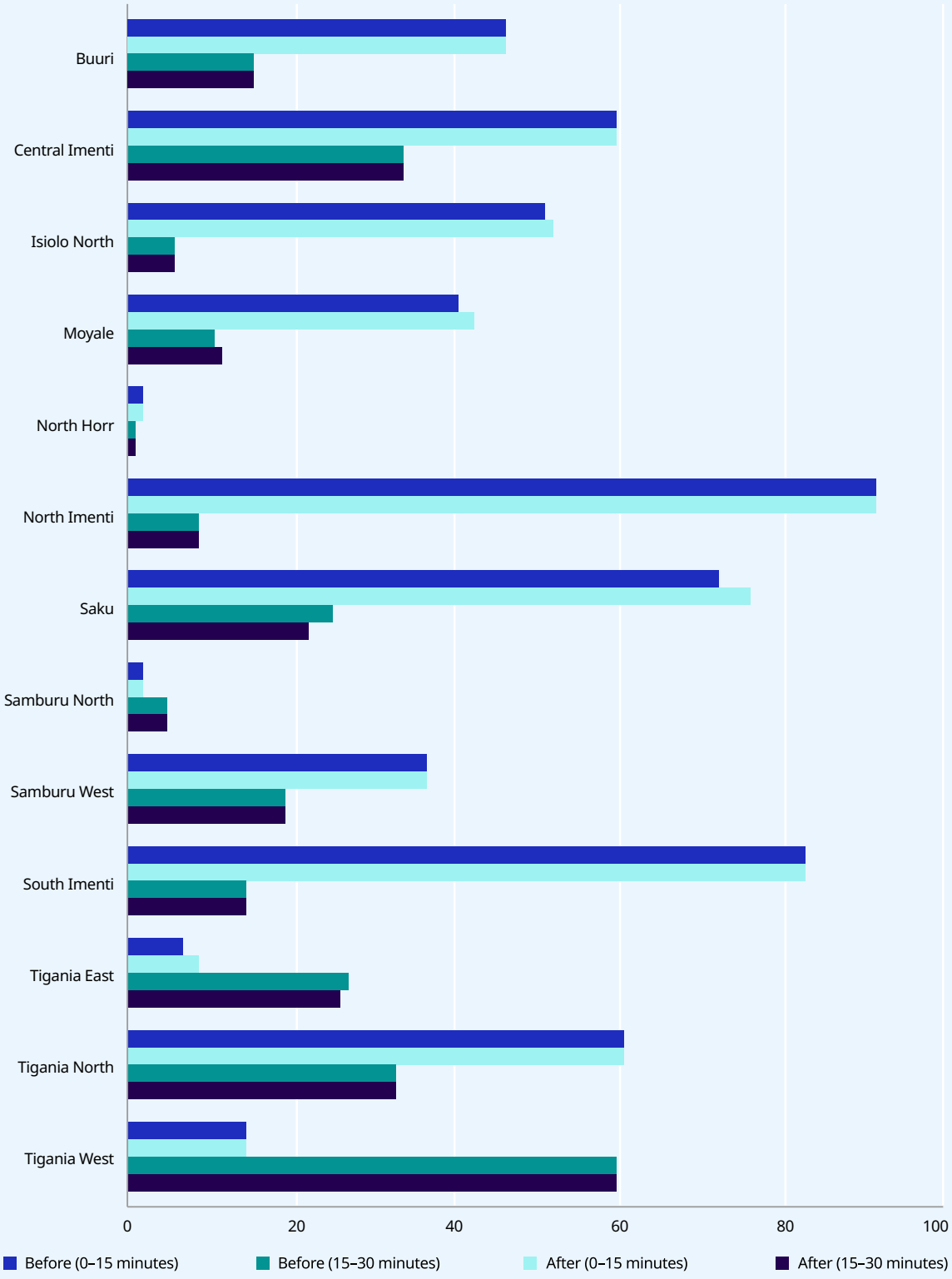
In addition to assessing the impact of road investments on access to social infrastructure, another valuable element of this analysis is that it reveals the large variation in access among regions, a pattern that holds throughout figures 5.5 to 5.9.

5.6. Discussion

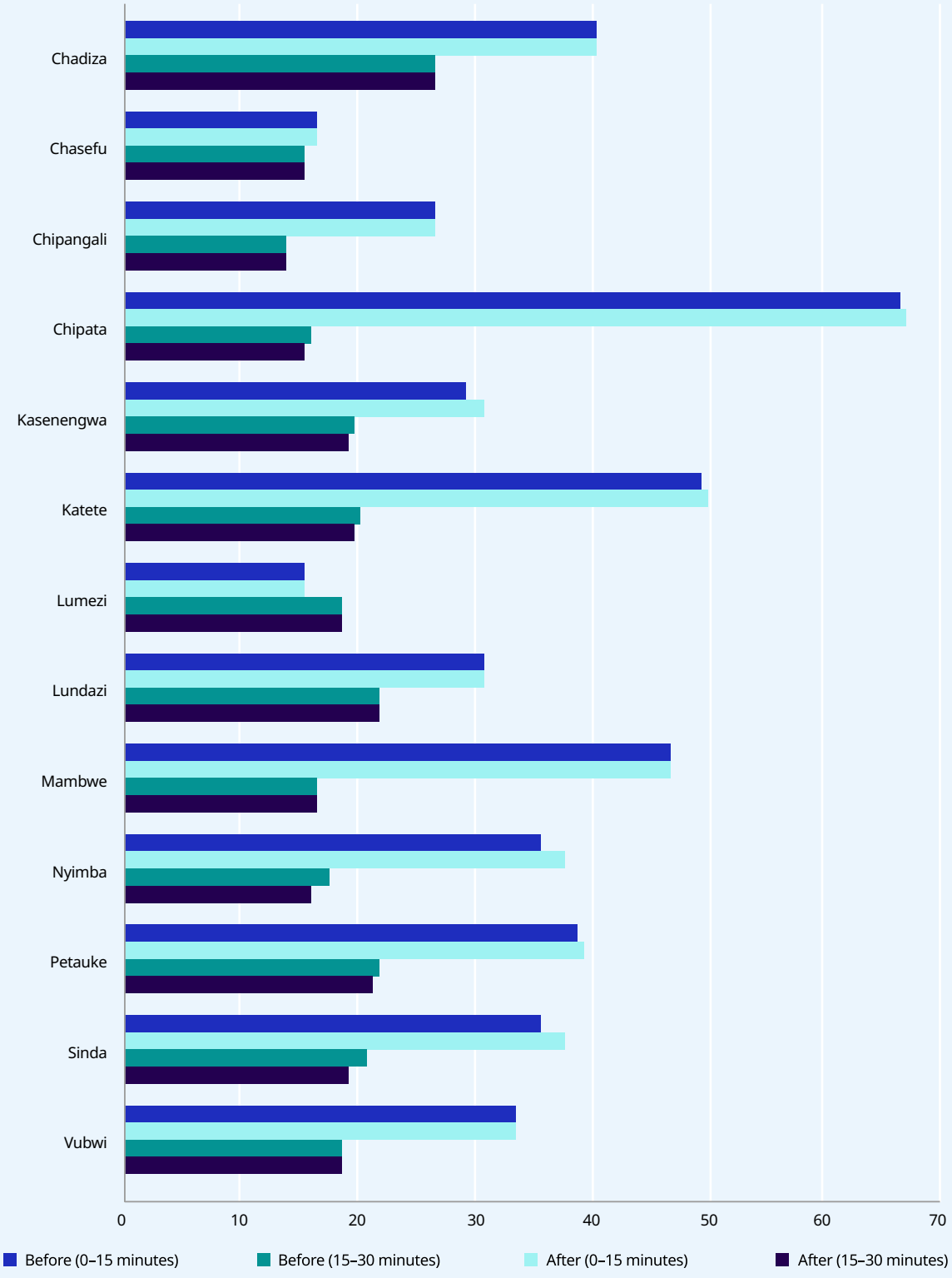
A number of studies have demonstrated the value of using NTL and other GIS data for assessing the impacts of policy interventions and investments (see Asher et al. (2021) regarding NTL data). There are nonetheless several limitations and qualifications that should be borne in mind when interpreting such results. In particular, our study uses NTL data to assess the impacts of road improvement investments in areas adjacent to transport corridors in Kenya and Zambia. Yet, we have noted in describing these projects that their objectives are wide-ranging and that they are also intended to contribute to economic development at the country and cross-country regional levels. Assessing the broader impacts of such investments requires complementary macro-level approaches.

An important example of such approaches is the ILO's SMSD (Jiang and La Marca 2023). The SMSD has been applied by Jiang and La Marca to provide an ex-ante assessment of the short- and long-run impacts of investments in road improvements in a different transport corridor in Zambia, the Great North Road Upgrading (GNRU). The project consists of a €435.6 million investment along a 372-kilometre-long stretch of road near the border between Zambia and the United Republic of Tanzania. The long-run impacts of the GNRU follow from an increase in transport capacity estimated to result in 6,813 jobs after the completion of the project, which the authors refer to as "permanent" jobs. Looking ahead, it would be particularly useful to apply NTL data analysis and the SMSD to estimate the employment impacts of the same investment project. These approaches could provide useful complements to each other, and enable one to situate the employment impacts in areas adjacent to road projects within more macro-level employment impacts.

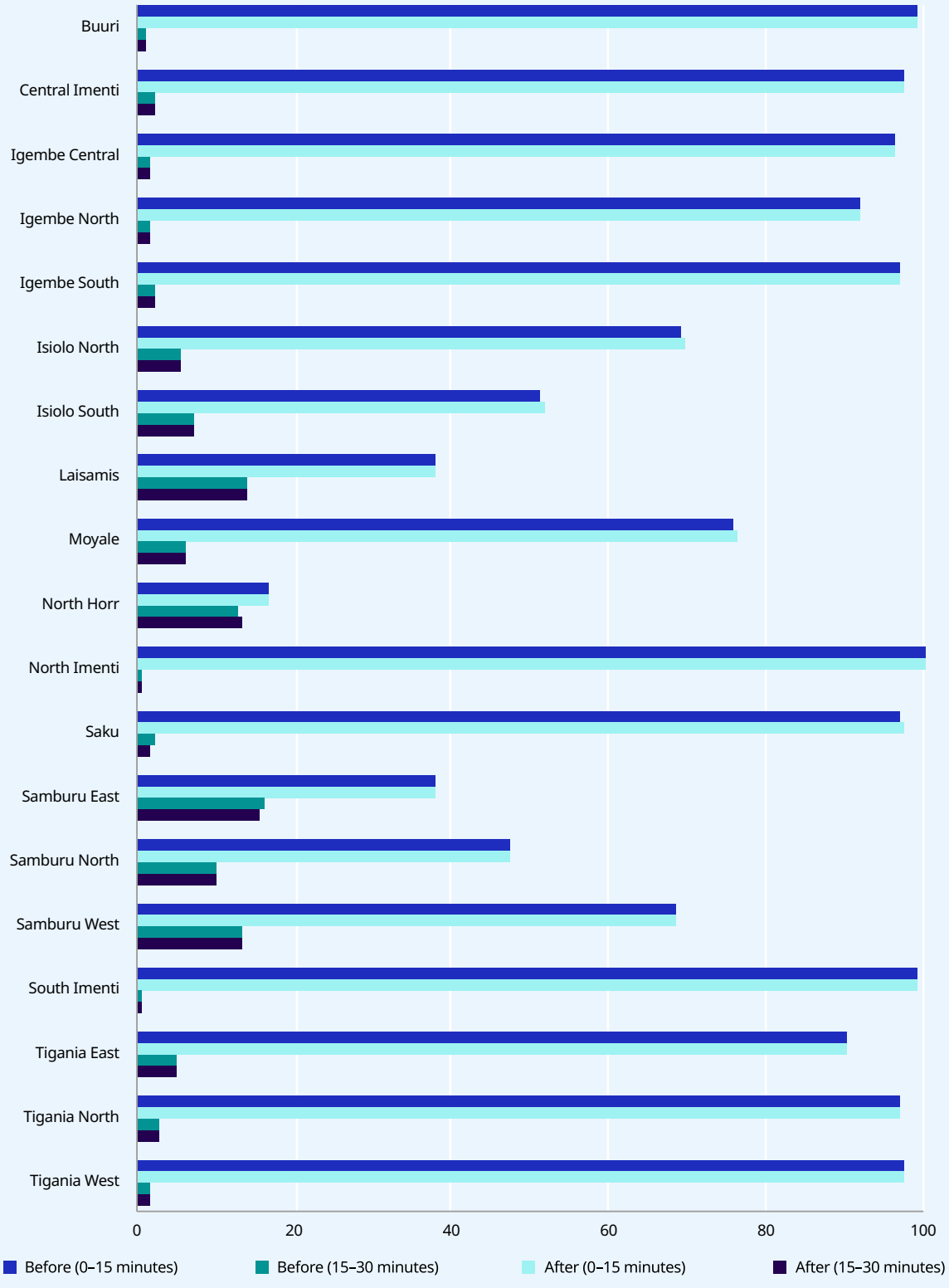
▶ **Figure 5.5. Share of the population in Kenya with access to healthcare facilities within 0–15 and 15–30 minutes before and after road improvement, by constituency** (percentage)



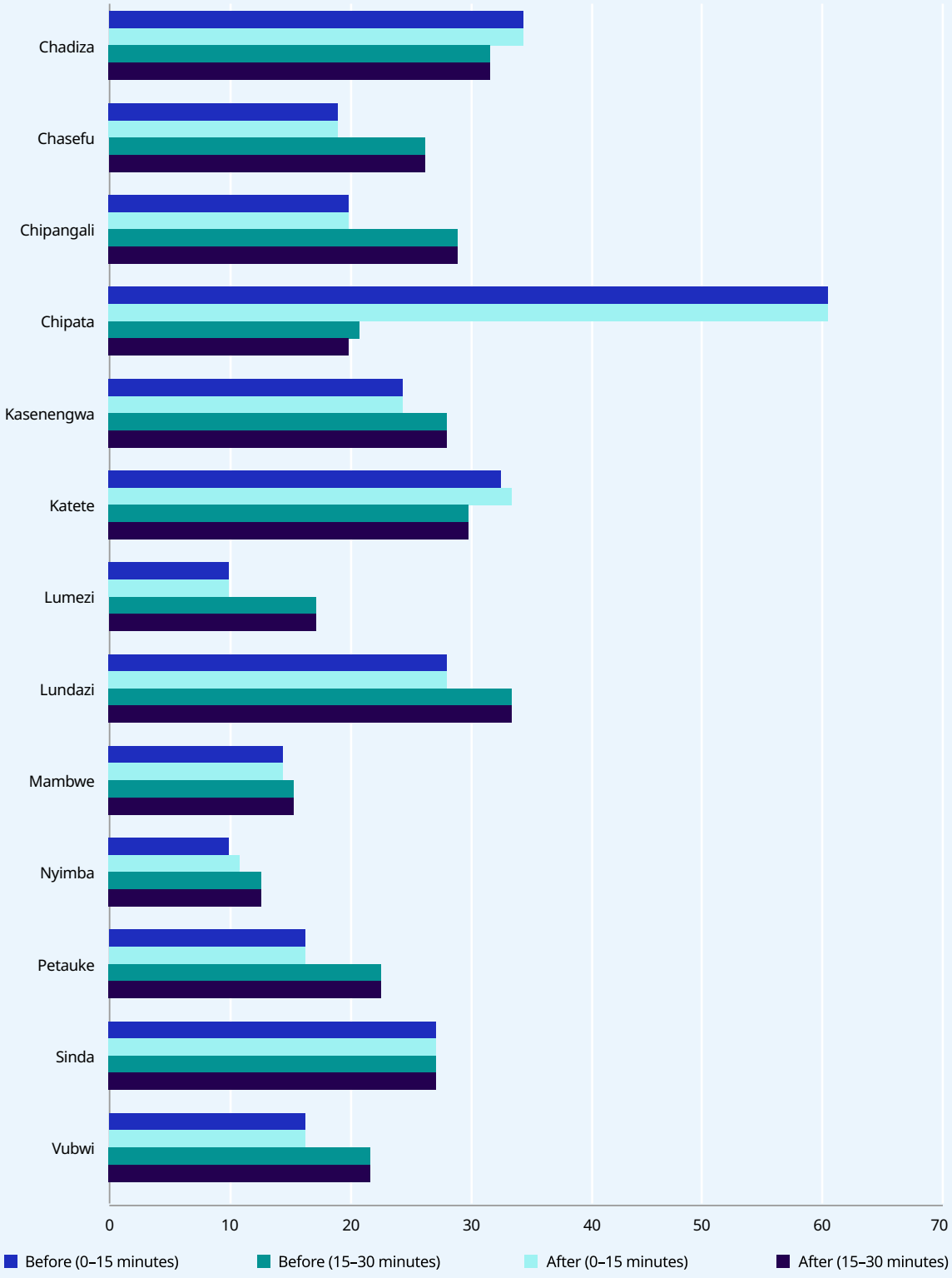
▶ **Figure 5.6. Share of the population in Zambia with access to healthcare facilities within 0–15 and 15–30 minutes before and after road improvement, by district** (percentage)



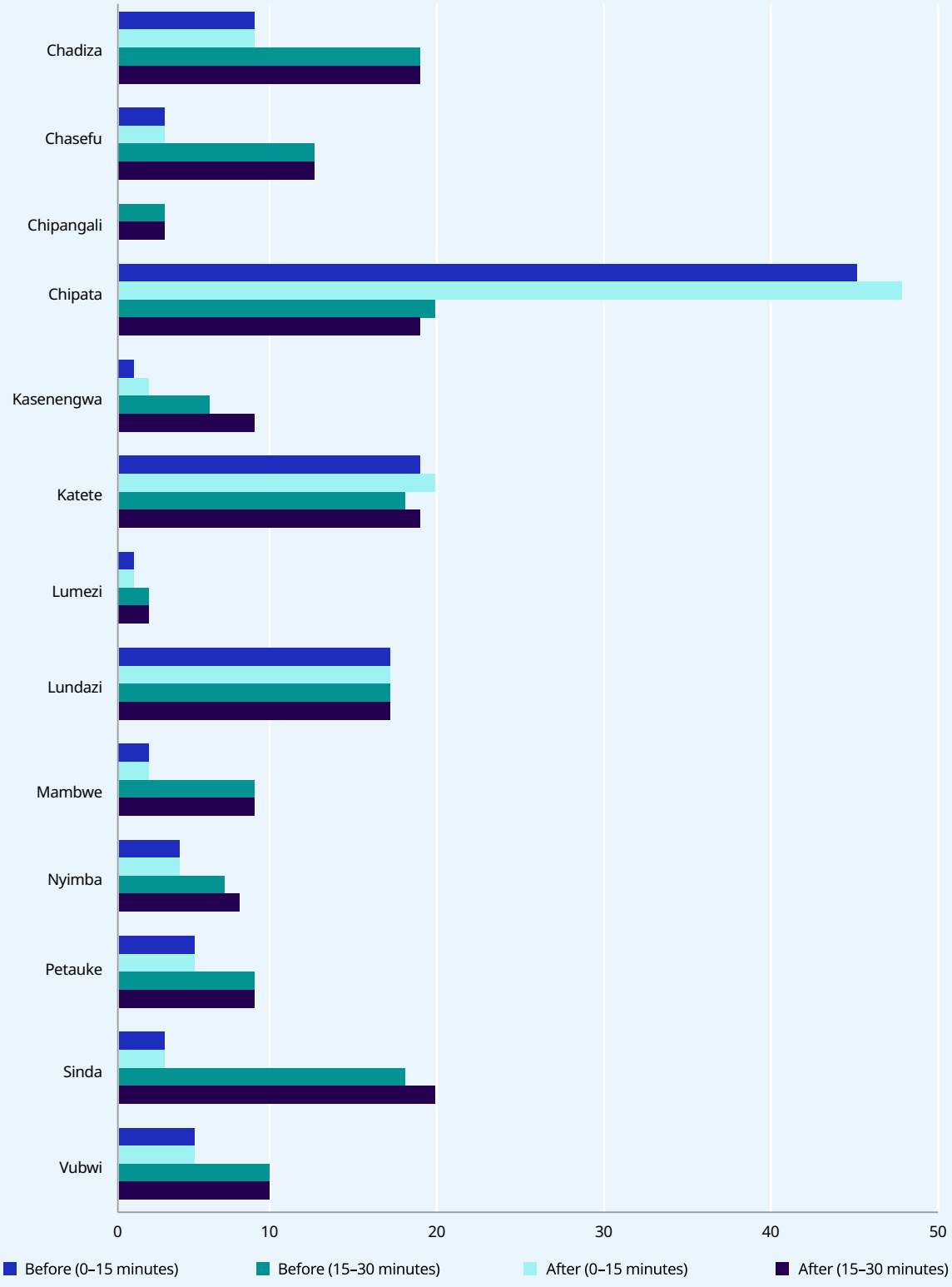
▶ **Figure 5.7. Share of the population in Kenya with access to primary schools within 0–15 and 15–30 minutes before and after road improvement, by constituency** (percentage)



▶ **Figure 5.8. Share of the population in Zambia with access to primary schools within 0–15 and 15–30 minutes before and after road improvement, by district** (percentage)



▶ **Figure 5.9. Share of the population in Zambia with access to secondary schools within 0–15 and 15–30 minutes before and after road improvement, by district** (percentage)



Because of the challenges of interpretation raised by Asher et al. (2021) regarding the independent variation between NTL and different development outcomes – employment being key among them, it would be useful to undertake comparative EmpIA using NTL and LFS data (as ceteris paribus as the data permit) to provide independent corroboration of the more roundabout employment estimates resulting from NTL data analysis. As noted, the use of LFS data also enables one to estimate employment impacts on different groups of workers and to address aspects of the quality of employment. Of course, one aspect makes NTL data analysis attractive: it is available more widely and at generally higher frequency than LFS data. Nonetheless, it would be useful to have a sample of such comparative studies to aid in the interpretation of NTL data analysis results.

We have also noted different types of bias that can arise in analyses of the impacts of road improvement investments. The first of these is endogeneity bias, resulting from the non-random placement of such investments. Following the literature (for example, Berg et al. 2015), we endeavoured to address this using DID methods (via fixed effects) and by evaluating areas along road corridors while excluding their endpoints. Though, such endogeneity bias is not specific to analyses using NTL data. We have also seen that, in both Kenya and Zambia, NTL luminosity is considerably higher in areas near the investments in road improvements – that is, considerably higher in treated than non-treated administrative units. This suggests that NTL luminosity may have grown more rapidly in treated than non-treated areas even in the absence of these investments. This implies that the estimates of the impacts on NTL are overstated or biased upwards, which, in turn, would result in overstated estimates of the impact of the investments on local GDP and employment.

The second type of bias, elaborated by Asher et al. (2021) based on data for India, results from systematically larger elasticities between NTL and employment and other development outcomes cross-sectionally than over time and for larger geographic units. Regarding our estimates on NTL, we feel that these are relatively conservative with respect to such bias, in that they are based on variation over time within small administrative units. However, we have noted that GDP and employment data are only available for Zambia for larger geographic units. However, for Kenya, GDP

The analysis of access to social infrastructure using spatial GIS data sheds light on how investment in road improvements can reduce travel time to schools and healthcare facilities.

data are available for larger geographic units and employment data, only at the country level. Insofar as the insights from Asher et al. (2021) are applicable to Kenya and Zambia, this suggests another possible source of bias for our estimates of employment impacts. Estimating the extent of these biases requires some sort of independent verification, such as through studies comparing employment impacts using NTL and LFS data. That is, comparing employment impacts of a given project using NTL and LFS data for different sizes of geographic units can provide a sense of which units provide truer estimates of employment impacts in a particular context. This is based on the assumption that the analysis of LFS data provides more direct, and thus more definitive, results. Taken together, these issues raise questions about the magnitude of the positive employment impacts of the investments we assess, though not that they are indeed positive.

The analysis of access to social infrastructure using spatial GIS data sheds light on how investment in road improvements can reduce travel time to schools and healthcare facilities. Yet, some limitations of this analysis are worth noting. The projects in both Kenya and Zambia were in rural areas with relatively sparse population. This, combined with the road improvements focusing on only one stretch of road (compared to multiple interconnected roads), is suggestive of why a fairly small share of the population has benefited from improved access. More generally, the accumulative cost method used to model the travel time does not account for the impact of traffic congestion nor that people use different types of motor vehicles travelling at different speeds. Finally, the analysis assumes that everyone can afford travel costs to schools and health facilities and so does not account for economic barriers nor social and cultural barriers to access.

5.7. Conclusion

This chapter applies two types of GIS data analysis to assess the ex-post impacts of large road improvement investment projects along transport corridors in Kenya and Zambia. The first uses NTL data as a proxy for economic activity, including local GDP and employment, and the second uses spatial data to conduct an analysis of accessibility to social infrastructure, specifically healthcare facilities and primary and secondary schools. We also discuss the theoretical literature that considers how road investments might have both positive and negative effects on economic activity in areas adjacent to these investments. These theoretical considerations are important regarding the effects of such investments on intended beneficiaries, for there is a common tendency to assume these effects on adjacent areas are positive.

We discuss GIS data analysis relative to other types of impact assessments – notably I–O and SAM employment multiplier analysis and RCTs – and argue that GIS data analysis has important comparative strengths for certain applications. In particular, GIS data analysis enables more location- and time-specific assessments of interventions than typical employment multiplier analysis and can be done more quickly and at a lower cost than RCTs. This is not to argue that GIS data analysis is preferable to or better than these other methods, and we have tried to be clear about its limitations and potential shortcomings for our applications. The motivation behind our country-specific examples of GIS data analysis is rather to demonstrate its potential as a useful complement to more established methods of impact assessment.

For the first strand of GIS analysis, key findings are that the road improvement investments in Kenya and Zambia had sizeable, statistically significant positive effects on economic activity in areas adjacent to these investments as proxied by NTL data, with estimates generally larger for Zambia than Kenya. For both countries, these effects tend to become considerably larger over time, and we were able to evaluate them up to four years after the completion of the project in Kenya and up to three years in Zambia. We argue that these estimates are relatively conservative in that they focus on variation over time within small administrative units. Using NTL–GDP and GDP–employment elasticities, we also estimate sizeable positive impacts of these road improvement investments on local GDP and employment. For Kenya, the estimated impacts on GDP and employment are considerably larger using elasticities based on average annual percentage changes in the ratios of NTL to GDP and GDP to employment, compared to elasticities based on regression analysis. An important area of future research is to undertake comparative analysis of a given investment project using both NTL and LFS data under various assumptions, to get a sense of how to obtain the most accurate employment estimates derived from NTL data. This would provide a greater sense of confidence in the magnitude of employment estimates based on NTL data – all the more important as NTL data are more readily available than LFS data, at high frequency and degrees of spatial resolution worldwide.

For the second strand of analysis, key findings are that, for the regions considered on average, road improvement investments in Kenya and Zambia resulted in fairly small shares of the population benefiting from reduced travel time to healthcare facilities and schools, increasing by less than 1 percentage point. Yet, impacts were more substantial for most affected regions, increasing by up to several percentage points for both Kenya and Zambia. Aside from enabling an assessment of the impact of road investments on access to social infrastructure, this strand of analysis shows the very large variation in access among regions in Kenya and Zambia, which provides useful guidance on where the need is greatest for investments in new healthcare facilities and schools.

This chapter highlights the potential of GIS data analysis, particularly NTL satellite data, for assessing the impacts of infrastructure investments and other policy interventions on economic and employment outcomes. The analysis of access to social infrastructure highlights how improved connectivity resulting from road investments can create more equitable access to essential services, thereby reinforcing social protection systems. Beyond the applications described here, GIS and remote sensing offer immense value for a wide range of ILO objectives. Monitoring of events that could influence employment outcomes, notably environmental change, has been conducted. For example, a study using satellite data and machine learning to assess the impacts of drought on crop yields in Zambia found substantial negative employment impacts (Dadich and Game, forthcoming). GIS can also be

used to support precise planning, monitoring and evaluation of ILO interventions, providing tools to map and track project progress remotely. Additional applications include:

- enhancing disaster response by assessing labour market impacts and targeting recovery efforts; and
- studying displaced populations by tracking migration patterns, as discussed in O'Higgins (2025).

These examples highlight opportunities for the ILO to more fully integrate GIS into its work – thus strengthening evidence-based policymaking – and demonstrate how targeted geographic information can inform strategies to promote DW and inclusive economic growth.

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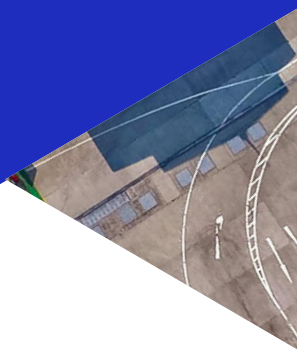

Chapter

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6

The impact of trade union rights on trade: An industry-level approach

Leanne Roncolato, David Kucera, Mark Anner and Dora Sari

6.1. Introduction

The debate on trade and international labour standards is venerable, motivating the creation of the International Labour Organization (ILO) in 1919 as part of the post-World War I Treaty of Versailles. Concerns over a "race to the bottom" in labour standards feature in the Preamble to the ILO Constitution, which states that "the failure of any nation to adopt humane conditions of labour is an obstacle in the way of other nations which desire to improve the conditions in their own countries". The trade and labour standards debate was revived with vigour in the 1990s, centring on whether there should be a "social clause" in international trade agreements, linking access to global markets with compliance with "core" labour standards. Broadly speaking, the debate pitted concerns over a race to the bottom from the global North against concerns over disguised protectionism from the global South. Yet, both proponents and opponents of a social clause shared a common premise: that compliance with international labour standards can result in higher labour costs and lower export competitiveness. A particular concern is that the impact of higher labour costs might fall more heavily on developing countries, given their greater reliance on labour-intensive, price-sensitive industries, most notably the wearing apparel industry. Workers in this industry are also disproportionately women, and so the debate took on a decided gender dimension expressed in concerns over the loss of scarce manufacturing jobs for women in developing countries (Kucera 2021).

The question of a social clause in *international* trade agreements overseen by the World Trade Organization (WTO) was set aside at the WTO's first Ministerial Conference in Singapore in 1996, which deferred to the ILO, as the body to address international labour standards (WTO 1996). The ILO followed with its 1998 Declaration on Fundamental Principles and Rights at Work, which obliges all ILO Member States to "respect and promote" the fundamental Conventions underlying the fundamental principles and rights at work by virtue of their membership in the ILO, whether or not they have ratified these Conventions.[54] The fundamental principles and rights at work are as follows:

1. freedom of association and the effective recognition of the right to collective bargaining;
2. the elimination of all forms of forced or compulsory labour;
3. the effective abolition of child labour;
4. the elimination of discrimination in respect of employment and occupation; and
5. a safe and healthy working environment.[55]

The WTO's Singapore Declaration quelled the debate on trade and labour standards, but only momentarily. There is renewed interest in the linkage between trade and labour standards arising from the rapid growth since 1990 of bilateral and regional preferential trade agreements (PTAs), of which a growing share contain labour provisions. The detailed substance of labour provisions in PTAs have been coded for nearly 500 PTAs from 1990 to 2015 by Raess and Sari (2018). They find that the 1998 Declaration and the fundamental principles and rights at work individually rank among the most frequently addressed labour provisions in PTAs, each referred to in at least 40 PTAs.

This chapter addresses the impacts on trade of the most contentious of the fundamental principles and rights at work – freedom of association and collective bargaining (FACB) rights with respect to workers and their organizations, which, in the context of this chapter, we refer to as TUR. As Brown, Deardorff and Stern (2011, 14) write, "the right to join a union is the standard that appears to evoke the most intensively negative response among labour standards critics." To our knowledge, ours is the first study to empirically investigate this question with a large sample of countries since papers from the mid-2000s (that used data from the mid-1990s) and the first to use newly developed indicators of TUR in such analysis – indicators that distinguish between overall TUR and TUR in law and in practice (Kucera and Sari 2019). It is also, to our knowledge, the first paper to:

- investigate the impacts of TUR on trade using panel data analysis, enabling us to address variation over time; and
- break down exports at such a disaggregated level, for 17 goods industries.

54 See the ILO Declaration on Fundamental Principles and Rights at Work.

55 The fifth fundamental right was added in June 2022 (ILO 2022).

The main findings of our chapter are as follows. In baseline (Poisson pseudo maximum likelihood (PPML)) regressions driven by change over time within countries, the chapter does not find robust evidence that stronger TUR are associated with lower aggregate goods exports. These results are particularly clear-cut for the sample of low- and middle-income countries as exporters, though somewhat less so for the full sample of countries as exporters. Indeed, we find then that the relationship between TUR and aggregate goods exports no longer holds when dropping just one country as an exporter from the sample. This country is Japan, for which we provide evidence that the observed changes in TUR are not plausibly linked to export performance. In short, the chapter does not find robust evidence in support of a race-to-the-bottom dynamic with respect to TUR and aggregate goods exports.

In baseline regressions at the industry level for the sample of low- and middle-income countries as exporters, a key finding of the chapter is that the six industries with statistically significant results show that stronger TUR are associated with higher exports. Regarding the labour intensity of production, the chapter finds (for both samples of countries) no clear patterns across industries and, in particular, no evidence that stronger TUR are associated with lower exports of wearing apparel. We address the validity of the result on wearing apparel by comparing patterns of wearing apparel exports for China and Viet Nam, the world's two largest apparel exporters with notably weak TUR (UNCTAD, n.d.).

The chapter also provides a discussion of motivation and theory, followed by a survey of empirical studies of the impact of TUR on trade. Then, it provides descriptions of the TUR and Freedom House (FH) democracy indicators that we use to complement the TUR indicators, followed by aggregate and industry-level results and concluding remarks. The trade model data, the model itself and the estimation method are discussed in Appendix 1.

6.2. Motivation and theory

It is not self-evident why TUR should be so contested in the trade and labour standards debate. TUR define a process rather than an outcome, and

> Even if the process of TUR might be argued to be determined exogenously, the outcome is determined endogenously.

so are consistent with heterogeneous outcomes among heterogeneous countries in line their levels of development (Aggarwal 1995). In other words, even if the process might be argued to be determined exogenously, the outcome is determined endogenously. Along with the other fundamental principles and rights at work, the ILO considers FACB rights for both employers and workers and their respective organizations to "enable the attainment" of the four ILO strategic objectives. The resolution concerning the third recurrent discussion on fundamental principles and rights at work, adopted by the International Labour Conference in 2024, states:

> "To strengthen action for the effective respect, promotion and realization of fundamental principles and rights at work, including in pursuit of the Sustainable Development Goals, governments, in consultation with the most representative employers' and workers' organizations, and taking account of national circumstances, should: [...] (c) give particular attention to freedom of association and the effective recognition of the right to collective bargaining, noting their particular importance to enable the attainment of the four strategic objectives, while ensuring balanced attention to all five categories [of fundamental principles and rights at work]." (ILO 2024, 16)

The ILO's four strategic objectives[56] are as follows:

- Set and promote standards and the fundamental principles and rights at work
- Create greater opportunities for women and men to decent employment and income
- Enhance the coverage and effectiveness of social protection for all
- Strengthen tripartism and social dialogue

56 See the mission and impact of the ILO.

TUR are also linked with democracy rights. As Brown, Deardorrf and Stern (1993, 30) put it in their discussion of TUR, "as a historical matter, the right to organize has been a precursor to the development of democratic institutions". Consistent with this, indicators of democracy and TUR are fairly highly correlated across countries (as we will see). As of 2015, FACB rights are also embodied at the highest international level, in the UN SDGs.[57]

The organization of workers into trade unions is the most concrete manifestation of TUR, and so debates on the impacts of TUR commonly centre around the question, "what do unions do?". We reference here the seminal work of Freeman and Medoff (1985) on the monopoly face versus collective voice face of trade unions. Unions raise wages for union members relative to comparable non-union members, while reducing overall wage inequality – findings that hold across developed and developing countries (Aidt and Tzannatos 2002; Fischer-Daly and Anner 2023; Hayter and Weinberg 2011; Turnbull 2003). Yet, higher wages for union members can be accompanied by higher worker productivity, offsetting the impact on labour costs. This is a key insight of the literature on "high road" employment practices, for which Osterman (2018) provides an essential survey. Osterman argues that the viability of the high road is supported by efficiency wage theories, which he writes "predict that higher-than-market wages lead to improved performance, and evidence suggests that these models capture reality" (Osterman 2018, 11).

There are multiple links in the causal chain mediating the relationship between TUR and labour costs, namely that:

- better laws and enforcement will lead to more unions, that these unions will be encompassing unions representing a significant share of workers in a sector; and
- such unions will have the strength to bargain collectively and raise wages and benefits significantly above prevailing market rates.

None of these links are unambiguous. The point is elaborated by Anner (2008) based on case studies of a number of countries in Latin America, which illustrate that stronger TUR do not necessarily result in greater union membership or stronger unions:

Despite a strengthening of collective labour rights in Latin America over the last 15 years, most labour movements in the region have lost power because neither the content nor the enforcement mechanisms associated with the labour reforms fully took into consideration the challenges presented by economic restructuring (Anner 2008, 33).

That is to say, while many labour law reforms were nominally "pro-labour," the reforms were relatively minor and unable to protect labour from dramatic market-oriented reforms that put downward pressure on wages.

A theoretical analysis of the impact of international labour standards on trade is provided by Brown, Deardorff and Stern (1993, 1998), who apply a Heckscher–Ohlin trade model in which a country's comparative advantage is determined by its relative endowments of the factors of production. In this framework, the authors consider whether various international labour standards "reduce the effective labour endowment of [low-income] countries and thereby the supply of labour-intensive production on the world market," in turn increasing the world prices of such goods (1998, 175). In contrast with standards on child labour, forced labour, minimum wages and maximum hours of work, the authors argue that TUR "do not, in any obviously important way, divert resources" – that is, do not change relative factor endowments – and thus are not expected to impact trade through Heckscher–Ohlin causal channels (1996, 18). Insofar as unions increase wages, however, their impact would be analogous to that of minimum wages, which the authors argue can reduce the effective endowment of labour. Even if stronger TUR directly lead to higher wages only for unionized workers, there can be important positive

Even if stronger TUR directly lead to higher wages only for unionized workers, there can be important positive spillover effects to non-unionized workers.

57 See the UN's SDG Indicators Metadata repository.

spillover effects to non-unionized workers through the extension of collective bargaining agreements and so-called threat and bargaining effects (Green et al. 2024). This brings us back to the discussion of the high road to economic development. Even if stronger TUR result in greater union membership and associated wage effects for unionized as well as non-unionized workers, the impact on labour costs and thus export competitiveness is mediated by worker productivity as per efficiency wage theories and the high road more broadly. Based on this set of considerations, the impact of TUR on trade is theoretically indeterminant, even leaving aside fundamental criticisms of the Heckscher–Ohlin trade model (for example, Lin and Chang 2009; Milberg 2002).

6.3. Prior empirical studies on the impact of trade union rights on trade

This section provides a survey of empirical studies published since 2000, addressing the impact of TUR on trade. There are rather few such studies, with main findings summarized in table 6.1. Busse (2002) uses the OECD TUR indicator to assess the impact of TUR on labour-intensive manufacturing exports in a cross-section of about 55 high-income and developing countries and a subsample of around 30 developing countries for the late 1990s.[58] For both samples of countries, the paper finds a sizeable and statistically significant relationship between stronger TUR and lower exports. Maskus (2004) also uses the OECD TUR indicator to assess the impact of TUR on labour-intensive manufacturing exports using a different industry classification than Busse (2002). He also uses a more sophisticated bilateral gravity trade model, looking at exports from 17 developing countries to 20 OECD countries in separate cross-sections for the mid- and late 1990s. The paper finds a sizeable and statistically significant relationship between stronger TUR and *higher* exports, exactly the opposite result of Busse. Dehejia and Samy (2004) assess the impact of unionization rates on exports for a cross-section of around 30 developing countries for the mid-1990s and find no relationship between these two key variables of interest.

Kucera and Sarna (2006) assess the effects of TUR on exports in a cross-sectional bilateral gravity trade model using data for over 150 high-income and developing countries for the mid-1990s. The paper uses several indicators of TUR, including Kucera's TUR indicator, the OECD TUR indicators, as well as unionization rates.[59] The paper looks at total exports and breakdowns into total manufacturing exports and capital-intensive, intermediate and labour-intensive manufacturing exports, using four different definitions of the last breakdown (including that used by Busse (2002)). Then, it undertakes a number of robustness checks including accounting for the endogeneity of TUR with respect to trade. Based on Kucera's indicator, the paper finds statistically robust evidence that stronger TUR are

▶ **Table 6.1. Empirical studies of the impact of trade union rights on trade**

Study	Main findings
Busse (2002)	Stronger TUR associated with less labour-intensive manufacturing exports
Maskus (2004)	Stronger TUR associated with more labour-intensive manufacturing exports
Dehejia and Samy (2004)	No statistically significant relationship between unionization rates and total exports
Kucera and Sarna (2006)	Stronger TUR associated with more total and total manufacturing exports Statistically significant relationships of opposite sign between TUR and labour-intensive manufacturing exports depending on assumptions

58 The OECD TUR indicator uses ILO textual sources as well as annual reports from ITUC and the US State Department to give OECD and non-OECD countries scores of 1, 2, 3 or 4 (strongest to weakest TUR in OECD (1996), and vice versa in OECD (2000)).

59 Kucera's TUR indicator uses similar sources as the OECD indicator, but codes these sources using a checklist of 37 evaluation criteria, with greater weight given to more severe violations of TUR, based on the author's judgement (Kucera 2007). Similar to Kucera and Sari's method, the indicator is normalized to range from 0 to 10 for the best to worst possible scores, with a "default" score of 10 given for all-encompassing violations of TUR.

associated with greater total exports. Across the full set of TUR indicators, the paper finds robust evidence that stronger TUR are associated with substantially greater total manufacturing exports. But for labour-intensive manufacturing exports, the paper finds statistically significant results of the opposite sign depending solely on which of the four definitions of labour-intensive manufacturing is used and whether or not regional dummy variables are included in the model. This helps reconcile how studies such as Busse (2002) and Maskus (2004) can come to such opposite results regarding the effects of TUR on labour-intensive manufacturing exports. Also, it demonstrates how sensitive such results can be to minor variations in method and that due diligence therefore necessitates systematic robustness checks.

There are two points worth emphasizing about these studies. First is that they prioritize exports from developing countries, particularly labour-intensive exports, consistent with concerns that such exports may be particularly adversely impacted by stronger TUR. Second is that they all use cross-sectional rather than panel data analysis and do not address time series variation nor omitted variable bias using fixed effects estimation methods. At least for our analysis, we find that not accounting for such fixed effects can result in highly biased estimates of the impacts of TUR on exports.

A more recent study by Robertson (2021) looks at a different, though related, question from the prior studies: how do TUR as embodied in labour provisions in PTAs impact exports, based on indicators developed by Raess and Sari (2018). The study applies a panel data gravity model for the years 1995 to 2018. For the full sample of countries, it finds positive impacts of stronger TUR in PTAs for manufacturing and total exports, and for total exports from low-income countries to the full sample of countries, though the last of these is not statistically significant.

Additional studies use the Raess and Sari (2018) indicators as the key explanatory variables in panel data gravity trade models to estimate the effects of labour provisions in PTAs on exports. However, these do not address TUR separately but as part of a much broader set of labour provisions. Timini, Cortinovis and López Vincente (2022) evaluate the years from 2000 to 2015 and find that, for a full sample of countries, PTAs with labour provisions have a larger positive effect on manufacturing trade than trade agreements without such provisions. For exports from countries in the South to the North, the study also finds a positive impact on exports for labour provisions in PTAs with weak enforcement mechanisms – though not for those with strong enforcement mechanisms – with the difference generally larger for labour-intensive manufacturing exports. Carrère, Olarreaga and Raess (2022) evaluate the years from 1990 to 2014 and, in contrast with the prior study, do not find an impact of PTAs with labour provisions on manufacturing trade for a full sample of countries. For manufacturing exports from countries in the South to the North, the study finds a positive impact of PTAs with labour provisions, largely driven by labour provisions with institutionalized cooperation provisions. The study also comes to a similar finding as Timini, Cortinovis and López Vincente (2022) regarding labour provisions with strong enforcement mechanisms.[60]

6.4. Trade union rights and democracy indicators

This chapter uses indicators of TUR developed by Kucera and Sari in collaboration with the Center for Global Workers' Rights (CGWR) at Penn State University, and accompanied by a website hosted by the CGWR (Kucera and Sari 2019).[61] These indicators have recently been used in several academic research papers as well as in a report by the OECD (Carrère, Olarreaga and Raess 2022; Jaax and van

60 See Kucera and Sari (2022) for a complementary survey of theoretical and empirical studies of the relationship between TUR and both trade and FDIs.

61 At the time of writing this chapter, the website for the TUR indicators is in the process of being moved to Rutgers University's School of Management and Labor Relations. The Rutgers website is expected to be fully operational in the second half of 2025. In the meantime, please reach out to the authors for access to the raw data. Following a resolution by the International Conference of Labour Statisticians in October 2018, the method also provides the basis for SDG indicator 8.8.2 on labour rights, which focuses on freedom of association and collective bargaining rights for both employers and workers and their respective organizations, based on the Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87), and the Right to Organise and Collective Bargaining Convention, 1949 (No. 98). We were not able to use SDG indicator 8.8.2 for this chapter, as it is only available beginning in 2015, the baseline year for the SDGs (see the UN's SDG Indicators Metadata repository).

Lieshout 2024; Kareem 2024; Timini, Cortinovis and López Vincente 2022). The method for these TUR indicators is based on the coding of TUR violations reported in nine publicly available textual sources: six from the ILO's supervisory system, annual reports from the International Trade Union Confederation (*ITUC Annual Survey of Violations of Trade Union Rights*) and the US State Department (*Country Reports on Human Rights Practices*, which contains a section on labour rights), and relevant national legislation for countries that have not ratified ILO Conventions Nos 87 and/or 98 on FACB.[62] For the purposes of evaluating the impact of TUR on trade, it would be ideal if the TUR indicators could be disaggregated by tradable and non-tradable industries. Yet, the textual sources do not consistently provide this information with sufficient precision. We return to this issue when we discuss how baseline regression results are not robust upon the exclusion of Japan as an exporter from the sample.

Coding was done by labour lawyers with ILO experience, using a checklist of 108 evaluation criteria, with distinct criteria for violations of TUR in law and in practice. This enables the construction of indicators of overall TUR and TUR in law and in practice, all three of which are used in our analysis. Greater weight is given to evaluation criteria representing more severe violations of TUR, based on the Delphi method of expert consultation, with the three indicators normalized to range from 0 to 10 for strongest to weakest TUR. A "default" score of 10 is given for all-encompassing violations of TUR – that is, for the general prohibition of the right to establish and join organizations, in law; the general prohibition of the development of independent workers' organizations, in practice; and the general prohibition of the right to collective bargaining, in law and in practice (though we test for the robustness of results with respect to these default scores).

The TUR indicators were constructed for the 185 ILO Member States as of 2015, but 14 of these countries were excluded from the sample on the grounds that their favourable scores primarily reflected a large degree of information bias, and specifically an underreporting of violations. Accordingly, only violations coded in the remaining 171 countries are used in our study and shown in the following figures.[63] More generally, we do not find evidence of systematically greater underreporting of TUR violations in the global South. This is supported by the fact that there is a consistently higher number of coded TUR violations, both in law and in practice, in the regions of the global South than the global North (see figures 4a and 4b in Kucera and Sari 2019, 435). Also relevant in this regard is that our baseline regressions focus solely on variation over time within countries rather than variation across countries. Average TUR indicator values across 171 ILO Member States are shown in figure 6.1 for overall TUR as well as TUR in law and in practice, for the years 2000, 2005, 2009, 2012 and 2015. As indicator values are largely driven by the number of violations of TUR, higher indicator values represent weaker rights and lower indicator values represent stronger rights. The overall TUR indicator increased overall from 3.4 in 2000 to 3.8 in 2015, suggesting a weakening of overall TUR. The figure shows that changes in the overall TUR indicator are largely driven by changes in the TUR in law indicator, which increased from 3.2 to 3.4 over these years. The TUR in practice indicator also increased from 2000 to 2005, from 2.6 to 3.0, after which it decreased overall to 2.85 in 2015. Figure 6.2 shows changes in the number of coded TUR violations – overall, in law and in practice – for these same years. These changes closely parallel those shown in figure 6.1, indicating that changes in the indicators are indeed driven more by changes in the number of coded violations than by changes in the composition of coded violations having different weights. Figure 6.2 also shows that in 2015, the overall number of

62 National legislation for countries that have ratified ILO Conventions Nos 87 and 98 are assessed by the ILO Committee of Experts on the Application of Conventions and Recommendations (CEACR), whose reports are one of the six coded ILO textual sources.

63 Exclusion from the sample is based on whether the difference between the overall TUR indicator and the FH civil liberties indicator is 5.0 or more for two or more (of five) years after rescaling the latter to also range from 0 to 10 as the best and worst possible scores, respectively. For countries for years 2000 to 2015, these are: Afghanistan, Angola, Azerbaijan, Chad, Congo, Gabon, Gambia, Guinea, Kyrgyzstan, Maldives, Somalia, South Sudan, Tajikistan and Yemen; For country-years, these are: Liberia (2000), Rwanda (2000), Côte d'Ivoire (2005), Democratic Republic of the Congo (2005), Togo (2005), and Central African Republic (2015). This method is applied each time the TUR indicators are updated, with findings published on the TUR indicators website.

discrete coded violations was nearly 3,000 – that is, an average of 17 coded violations per country.[64]

We complement these TUR indicators with democracy indicators that have been widely used in empirical analyses, including in models of economic growth and FDI (for example, Gerring et al. 2005; Kucera and Principi 2014). These are the FH civil liberties and political rights indicators. The FH civil liberties indicator is based on a set of questions broken down into four categories:

- freedom of expression and belief;
- associational and organizational rights;
- rule of law; and
- personal autonomy and individual rights.

Figure 6.1. Global trade union rights indicators, 2000–15 (unweighted country average)

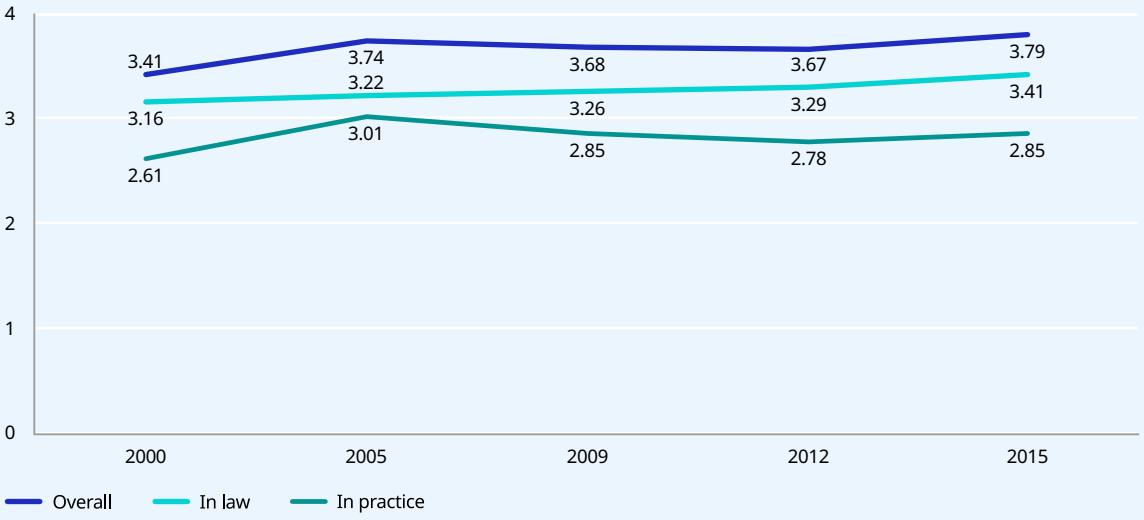
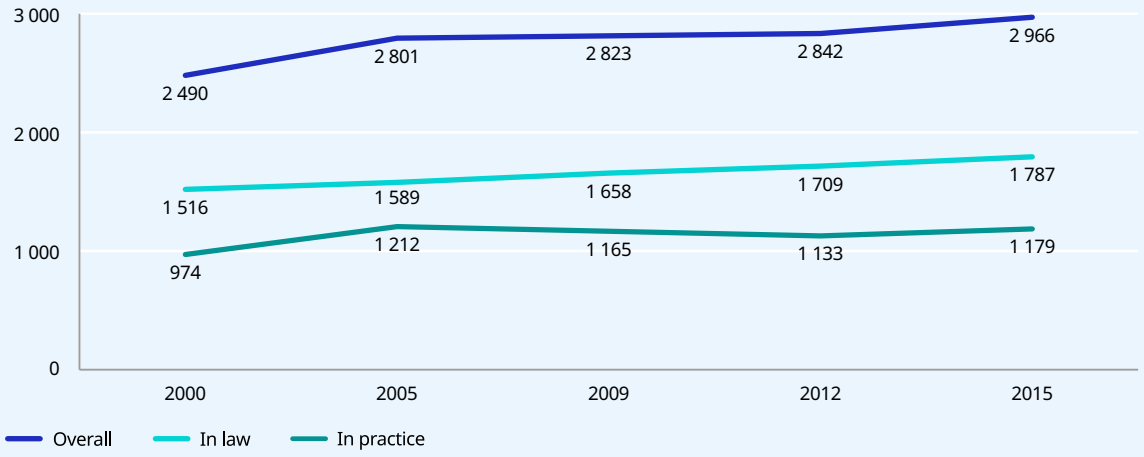


Figure 6.2. Global number of coded violations of trade union rights, 2000–15



64 The figure 2,966 is discrete in the sense that it represents the number of violations coded across the evaluation criteria based on binary coding and does not reflect the many cases where the same type of violation is coded multiple times within any given evaluation criterion based on the coding of multiple textual sources.

Under associational and organizational rights, one question relates directly to trade unions: Are there free trade unions and peasant organizations or equivalents, and is there effective collective bargaining? The FH political rights indicator is based on a set of questions broken down into three categories: electoral process, political pluralism and participation, and functioning of government. FH scales indicators to range from 1 to 7, with lower values meaning stronger civil liberties and political rights (Freedom House 2011).

As noted in section 6.1, TUR and democracy rights are linked both conceptually and historically. Consistent with this are fairly high correlations between the TUR indicators and FH civil liberties and political rights indicators. For example, the correlation coefficients (Pearson) between the overall TUR indicator and the FH civil liberties and political rights indicators are 0.72 and 0.68, respectively. Our analysis uses all available years of the TUR indicator up to 2015 – that is, 2000, 2005, 2009, 2012 and 2015 – and the same years for the FH indicators as well as other explanatory variables. For ease of interpreting econometric results, we rescale the TUR (including the individual in law and in practice indictors) and FH indicators to range from 0 to 1 for strongest to weakest rights.

6.5. Aggregate-level results

As noted above, readers interested in the trade model data as well as the model and estimation method should refer to Appendix 1.

Table 6.2 presents results from estimating the impact of overall TUR on trade exports using different fixed effects models. Column 1 shows the relationship between overall TUR and trade exports without any fixed effects. Here, we observe a statistically significant (at the 1-per-cent level) positive coefficient estimate on overall TUR, consistent with the view that countries with weaker overall TUR tend to export more. In column 2, we introduce importer-year fixed effects (which include importer and year fixed effects separately), thus controlling for importer-year characteristics, such as GDP per capita in importer countries. In columns 1 and 2, we are primarily observing the impact of cross-sectional variation in overall TUR of exporting countries on the value of their exports. Indeed, for the years considered, there is a lot more variation in the TUR indicators across countries than over time.[65] Notably, there are 21 countries in the sample for which there are no changes in the overall TUR indicator between 2000 and 2015, including such large exporters as the Netherlands and Norway (with strong TUR and rescaled scores of just above zero), and China and Viet Nam (with weak TUR and consistently worst possible rescaled scores of one).[66]

The results shown in columns 1 and 2 control for exporter characteristics from the standard gravity model. Yet, other characteristics may also have an important impact on exports. Not accounting for these other exporter characteristics can result in omitted variable bias, not least on the coefficient estimates on the TUR indicators. To address this concern, column 3 shows results upon adding pair fixed effects – which include exporter fixed effects – in addition to importer-year fixed effects. Given the large number of exporters and importers in our sample, including pair fixed effects adds over 33,000 dummy variables to the estimation. Moreover, the number of single observations of specific exporter-importer pairs results in many observations dropping when including pair fixed effects. Pair fixed effects also cancel out pairwise explanatory variables that we prefer to keep explicit. Given these issues and that our main concern is with omitted variable bias towards exporter characteristics, our preferred specification – from which we derive baseline results – includes importer-year fixed effects and exporter fixed effects, with results shown in column 4. The full set of results with importer-year and pair fixed effects are available

65 The overall TUR indicator has a standard deviation of 0.277 for the full panel of country-years, of which 0.270 is accounted for by between (cross-sectional) variation and 0.071 by within (over time) variation. The relatively small variation over time is partly explained by the fact that legislation does not change frequently but also that the reporting period for countries with respect to fundamental ILO Conventions is, in principle, every three years. According to the coding rules of the TUR indicators method, the coding of the previous report is carried over until a new report is adopted by the CEACR.

66 Additional countries with no variation in the overall TUR indicator from 2000 to 2015 break down into two groups: 1. Cuba, Egypt, Equatorial Guinea, Islamic Republic of Iran, Iraq, Lao People's Democratic Republic, Libya, Qatar, Saudi Arabia, Turkmenistan, United Arab Emirates and Uzbekistan, all having weak TUR and worst possible rescaled scores of one; 2. Finland, Marshall Islands, Palau, San Marino, and Sao Tome and Principe, all having strong TUR and rescaled scores of zero (for Finland and San Marino) or just above zero.

upon request and are consistent with findings from our preferred specification.

Practically speaking, the difference is negligible between coefficient estimates on overall TUR between columns 3 and 4; both are positive and of a similar magnitude – 0.18 and 0.23, respectively – and both are statistically significant (at the 5-per cent level). Yet, both coefficient estimates are considerably smaller than those in columns 1 and 2, suggesting that omitted variable bias is a real concern. While results in columns 1 and 2 are largely driven by cross-sectional variation, results in columns 3 and 4 are driven entirely by variation over time within countries.

Assessing our baseline specification more generally, column 4 provides statistically significant evidence that higher GDP per capita and larger population are associated with more exports, while greater distance between country pairs is associated with less trade between them, consistent with the logic of the gravity trade model. There is statistically significant evidence that regional trade agreements, contiguity and having had a colonial relationship between country pairs are associated with more

▶ **Table 6.2. Impact of trade union rights on total exports, different fixed effects models, 2000–17**

	(1)	(2)	(3)	(4)
	No fixed effects	Importer-year fixed effects	Importer-year and pair fixed effects	Importer-year and exporter fixed effects
TUR overall	1.11***	1.03***	0.18**	0.23**
	(0.17)	(0.10)	(0.08)	(0.09)
GDP per capita (log)	0.96***	0.90***	0.86***	0.81***
	(0.04)	(0.02)	(0.04)	(0.05)
Population (log)	0.78***	0.79***	0.82***	0.90***
	(0.03)	(0.02)	(0.08)	(0.10)
Regional trade agreement	0.75***	0.40***	0.05*	0.38***
	(0.09)	(0.06)	(0.03)	(0.05)
Distance (log)	–0.62***	–0.61***		–0.63***
	(0.07)	(0.04)		(0.03)
Contiguity	1.10***	0.50***		0.41***
	(0.22)	(0.11)		(0.09)
Common language	–0.10	–0.00		0.06
	(0.14)	(0.10)		(0.08)
Colonial relationship	0.06	0.13		0.29***
	(0.18)	(0.10)		(0.09)
Importer-year fixed effects	No	Yes	Yes	Yes
Pair fixed effects	No	No	Yes	No
Exporter fixed effects	No	No	–	Yes
Observations	145 838	145 722	129 782	145 722
r2_p	0.479	0.826	0.893	0.845
chi2	2 445.3	5 214.7	480.8	2 011.9

Key: * = significant at 10 %; ** = significant at 5 %; *** = significant at 1 %.

Note: PPML estimation, standard errors clustered by pair.

▶ **Table 6.3. Impact of trade union rights and democracy on total exports, 2000–17**

	(1) Overall	(2) In law	(3) In practice	(4) Civil liberties	(5) Political rights	(6) Civil liberties and TUR	(7) Political rights and TUR
TUR overall	0.23**					0.23**	0.23***
	(0.09)					(0.09)	(0.09)
TUR in law		0.16					
		(0.13)					
TUR in practice			0.14**				
			(0.06)				
FH civil liberties				–0.14		–0.15*	
				(0.09)		(0.09)	
FH political rights					0.23***		0.24***
					(0.08)		(0.08)
GDP per capita (log)	0.81***	0.81***	0.81***	0.82***	0.82***	0.82***	0.82***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Population (log)	0.90***	0.90***	0.90***	0.91***	0.91***	0.92***	0.92***
	(0.10)	(0.11)	(0.10)	(0.11)	(0.11)	(0.10)	(0.10)
Regional trade agreement	0.38***	0.38***	0.38***	0.38***	0.38***	0.38***	0.38***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Distance (log)	–0.63***	–0.63***	–0.63***	–0.63***	–0.63***	–0.63***	–0.63***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Contiguity	0.41***	0.41***	0.41***	0.41***	0.41***	0.41***	0.41***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Common language	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Colonial relationship	0.29***	0.29***	0.29***	0.29***	0.29***	0.29***	0.29***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Importer-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exporter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	145 722	145 722	145 722	145 722	145 722	145 722	145 722
r2_p	0.845	0.845	0.845	0.845	0.845	0.845	0.845
chi2	2 011.9	2 012.5	1 996.0	2 000.1	1 992.7	2 015.9	2 010.9

Key: * = significant at 10 %; ** = significant at 5 %; *** = significant at 1 %.

Note: PPML estimation, standard errors clustered by pair.

trade between them, while sharing a common language is not found to be statistically significant (though both colonial relationship and common language are positive and statistically significant in the sample excluding high-income countries as exporters, as we will see).

Results from our preferred specification with importer-year and exporter fixed effects are shown in table 6.3, with the seven columns differing in which TUR and democracy indicators are included. Starting with the overall TUR indicator among our key explanatory variables of interest, we find a positive and statistically significant coefficient of 0.23, as reported in column 4 of table 6.2. Taking this result at face value suggests that, all else held constant, a 10-per-cent increase in the TUR indicator (weakening of TUR) is associated with a 2.3-per-cent increase in exports.[67] As noted above, the TUR indicator has a lot more variation across countries than within countries. When we run separate regressions for each year without exporter fixed effects, we find statistically significant positive coefficient estimates ranging between 0.82 to 1.09, none of which are significantly different (at the 5-per-cent level based on confidence intervals) from the coefficient estimate of 1.03 in column 2 of table 6.2 (results available upon request). This further confirms that results from specifications without exporter fixed effects are driven by cross-sectional variation, which are thus most directly comparable with the findings of prior empirical studies surveyed above. From a country-level policy perspective, it is worth remarking that results driven by variation across countries are less relevant than results driven by variation over time within countries, on top of concerns about omitted variable bias.

Columns 2 and 3 of table 6.3 address the extent to which the results on overall TUR are driven by TUR in law versus in practice. We find a positive, though not statistically significant, coefficient estimate on TUR in law. For TUR in practice, we find a positive and statistically significant (at the 5-per-cent level) coefficient estimate. Then, for our baseline specification, the result on overall TUR is driven more by TUR violations in practice rather than in law. Columns 4 and 5 of table 6.3 assess the relationship between the FH democracy indicators and exports. For the FH civil liberties indicator, we do not find a statistically significant coefficient estimate; for the FH political rights indicator, we find a positive and statistically significant coefficient estimate. Results are similar when combining the overall TUR indicator and the FH civil liberties and political rights indicators individually, shown in columns 6 and 7.[68]

Table 6.4 addresses the extent to which baseline results for the full sample of countries are driven by specific large exporting countries. In particular, each of the columns shows results upon dropping, as exporters from the sample, each of the eight countries which exported over US$100 billion in total exports to a single importer for any given year. These countries are Canada, China, Germany, Japan, Mexico, the Netherlands, the Republic of Korea and the United States. Dropping Japan, we no longer find a statistically significant relationship between the value of exports and TUR, neither overall nor in practice.[69] The reason for this becomes clear when comparing the variation over time within countries between TUR and exports. Japan has the second-most within-country variation over time in the indicator of overall TUR among the eight large exporters (with a standard deviation of 0.066). There is positive correlation between the indicator and exports in Japan, meaning that *stronger* TUR are correlated with *lower* exports, consistent with baseline results for the full sample of countries. What is striking about Japan, though, is that the coding for the TUR indicator shows that the strengthening of TUR does not pertain to workers in tradable sectors but rather in the public

67 This specification with the balanced panel yields a very similar coefficient of 0.24, with results available upon request.

68 In Column 6, the coefficient on civil liberties is of borderline statistical significance (at the 10-per-cent level). When all specifications in table 6.3 are run with pair fixed effects instead, the coefficient on civil liberties is not statistically significant based on the specifications in columns 4 and 6. Full pair fixed effects results available upon request. We also check the robustness of results with respect to variations in the construction of the TUR indicators. This is because the application of the default score (worst possible unscaled score of 10) to the construction of the TUR indicators for general prohibitions of TUR skews the distribution of these indicators. As such, we run the baseline model, which uses TUR indicators that do not apply the default score and drops country-years from the sample for which the default score was applied (that is, dropping the observations reflecting the weakest possible TUR). Overall, our baseline results as shown in table 6.3 are robust with respect to these variations in the construction of the TUR indicators. Results are available upon request.

69 In the specification with pair fixed effects, the coefficient on overall TUR is no longer statistically significant when excluding the United States. Results are available upon request, including results on TUR in practice dropping Japan as an exporter from the sample.

▶ **Table 6.4. Impact of TUR on total exports excluding large trading and high-income countries as exporters, 2000–17**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Excluding Canada	Excluding China	Excluding Germany	Excluding Japan	Excluding Mexico	Excluding Netherlands	Excluding Korea (Rep.)	Excluding United States	Excluding high-income countries
TUR overall	0.25***	0.24***	0.20**	0.06	0.26***	0.26***	0.24***	0.15*	–0.15
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.12)
GDP per capita (log)	0.81***	0.87***	0.84***	0.76***	0.83***	0.83***	0.83***	0.80***	0.74***
	(0.05)	(0.08)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)
Population (log)	0.90***	0.92***	0.98***	0.76***	0.91***	0.89***	0.92***	0.89***	–0.04
	(0.10)	(0.11)	(0.11)	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)	(0.26)
Regional trade agreement	0.38***	0.44***	0.34***	0.37***	0.38***	0.38***	0.37***	0.38***	0.36***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)
Distance (log)	–0.63***	–0.65***	–0.66***	–0.63***	–0.64***	–0.62***	–0.63***	–0.64***	–0.83***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)
Contiguity	0.41***	0.42***	0.48***	0.41***	0.39***	0.34***	0.42***	0.35***	0.41***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)	(0.09)	(0.11)
Common language	0.06	0.05	0.01	0.07	0.05	0.11	0.04	0.11	0.20***
	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Colonial relationship	0.29***	0.29***	0.28***	0.30***	0.36***	0.30***	0.29***	0.34***	0.60***
	(0.10)	(0.09)	(0.10)	(0.10)	(0.09)	(0.09)	(0.10)	(0.10)	(0.10)
Importer-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exporter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	144 691	144 691	144 689	144 692	144 692	144 692	144 689	144 689	99 223
r2_p	0.841	0.831	0.838	0.841	0.845	0.843	0.844	0.837	0.838
chi2	1 754.6	2 325.5	2 169.5	1 925.3	1 912.9	2 017.8	1 967.4	1 870.0	1 396.7

Key: * = significant at 10 %; ** = significant at 5 %; *** = significant at 1 %.

Note: PPML estimation, standard errors clustered by pair.

sector, for railway and postal workers and workers in national medical institutions as regards in-practice violations.[70] Thus, it seems implausible that stronger TUR are causally linked with lower exports in Japan and more plausible that the correlation is spurious.

Column 9 of table 6.4 evaluates a subsample of low- and middle-income countries as exporters, defined as non-high-income countries based on the World Bank's gross national income per capita thresholds (World Bank, n.d.). Alongside a change of sign on the coefficient estimate of overall TUR, we also find here that the relationship between exports and overall TUR is no longer statistically significant.[71] It is worth emphasizing that the previous empirical studies surveyed above on the impact of TUR on trade prioritize samples of developing countries as exporters on the grounds that they are particularly consequential in the trade and labour standards debates. As such, the result on the sample excluding high-income countries as exporters should not be taken in passing but rather as a key result.

6.6. Industry-level results

As noted in section 6.1, the debates on trade and labour standards focus on certain industries, particularly labour-intensive and price-sensitive industries like wearing apparel. As such, we estimate separately for 17 goods industries, the same model specification as in columns 2 and 4 of table 6.2 – without and with exporter fixed effects, respectively – and consider findings in light of a classification of manufacturing industries as labour-intensive, capital-intensive and intermediate (Kucera and Sarna 2006).[72] Recall that results without exporter fixed effects are primarily driven by variation across countries whereas results with exporter fixed effects are driven solely by change over time within countries. To make results more readily apparent, we present industry-level coefficient estimates in figures 6.3 and 6.4 for overall TUR in the full sample of countries and in the sample excluding high-income countries as exporters, respectively, as well as estimates for aggregate goods exports.

The full industry headings used in figures 6.3 and 6.4 are as follows:

1. Agriculture, forestry and fishing
2. Mining and quarrying
3. Food products, beverages and tobacco products
4. Textiles
5. Wearing apparel, leather and related products
6. Wood and wood products
7. Paper products and printing
8. Chemicals and chemical products
9. Rubber and plastics products, and other non-metallic mineral products
10. Basic metals and fabricated metal products, except machinery and equipment
11. Machinery and equipment not elsewhere classified
12. Office, accounting and computing machinery
13. Electrical machinery
14. Communication equipment
15. Medical, precision and optical instruments, watches and clocks
16. Transport equipment
17. Manufacturing not elsewhere classified (n.e.c.)

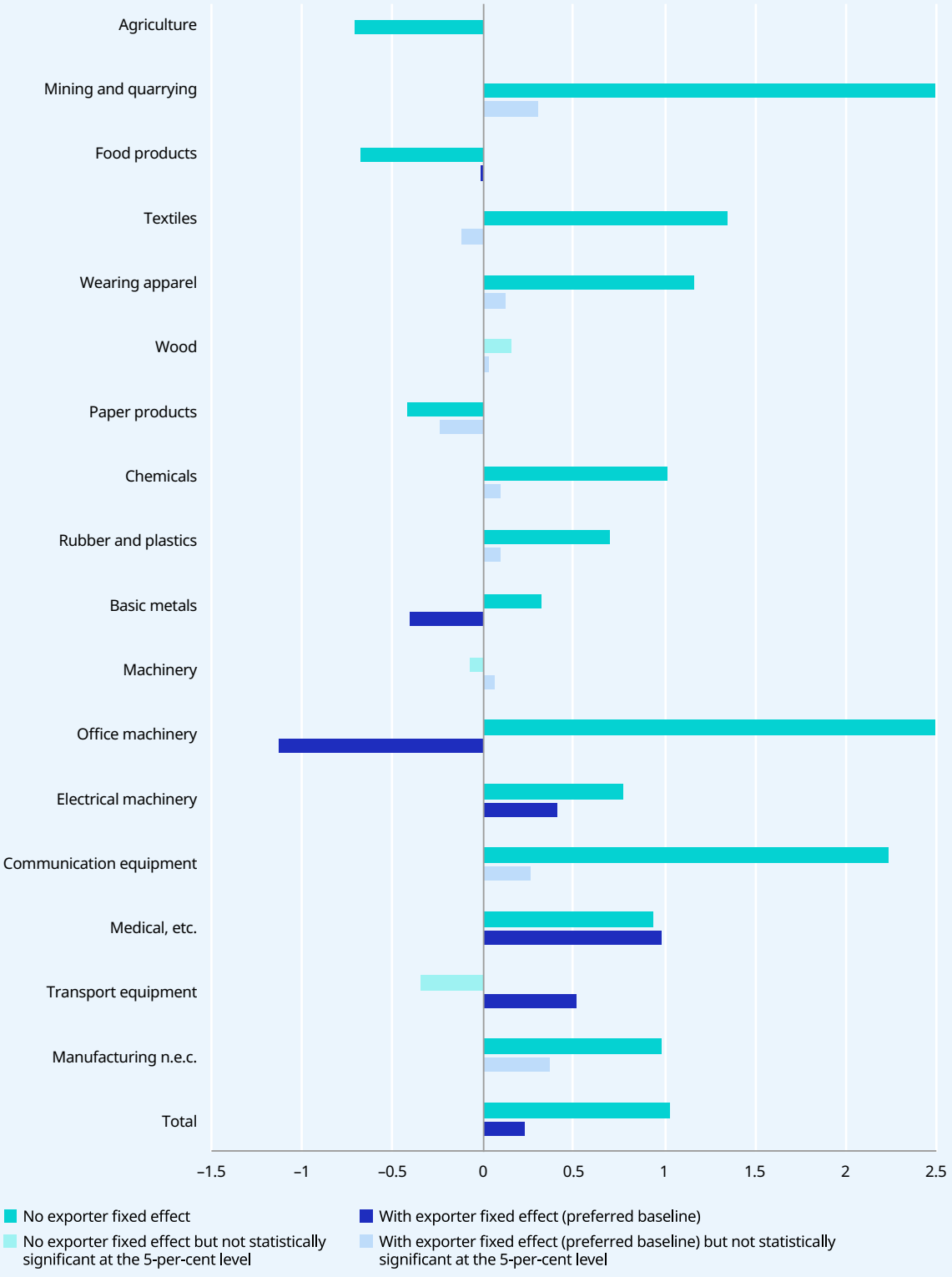
Starting with figure 6.3, for the full sample of countries, without exporter fixed effects, there are statistically significant positive coefficient estimates on the overall TUR indicator for 11 of the 17 industries. These include such labour-intensive industries as textiles and wearing apparel, but also relatively capital-intensive industries, such as chemicals and rubber and plastics. In contrast, we find statistically significant negative coefficient estimates for agriculture, food products and paper products. Results without exporter fixed effects are broadly similar for the sample of countries excluding high-income countries as exporters, as

70 The coding for Japan is available from the TUR indicators website and is also available up on request.

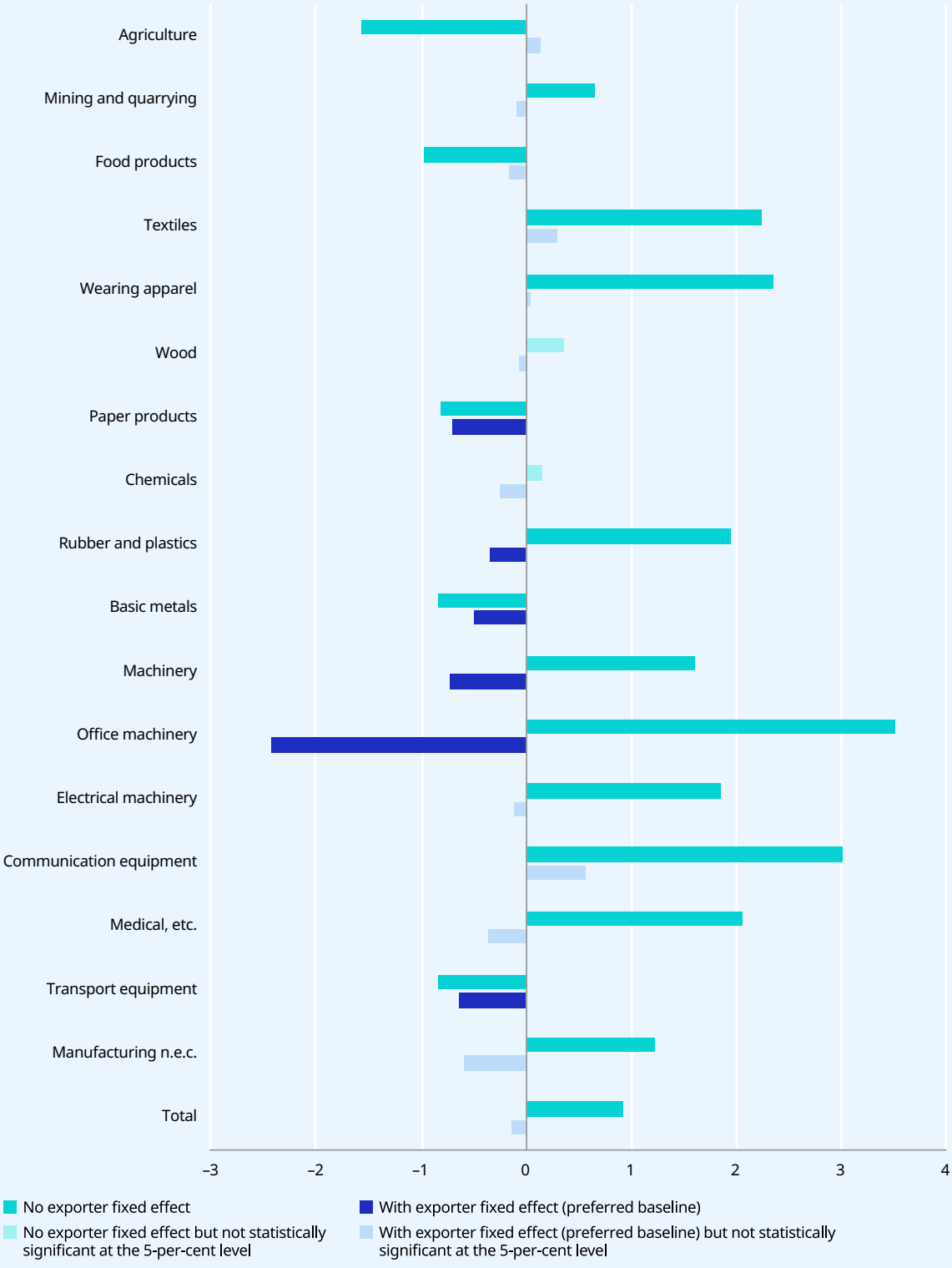
71 In the specification with pair fixed effects, when excluding high-income countries as exporters, the negative coefficient on overall TUR is statistically significant at the 5-per-cent level. Results are available upon request, including results on TUR in law and in practice dropping high-income countries as exporters from the sample.

72 The 17 industries are consolidated from the harmonized system's 96 six-digit industry-level data provided in the BACI database. Kucera and Sarna (2006) rank manufacturing industries for 29 large trading countries based on ratios of employment to value added, and then group these into categories of labour-intensive, intermediate and capital-intensive industries.

▶ Figure 6.3. Industry-level results on impact of overall trade union rights on exports, 2000–17



▶ Figure 6.4. Industry-level results on impact of overall trade union rights on exports excluding high-income countries as exporters, 2000–17

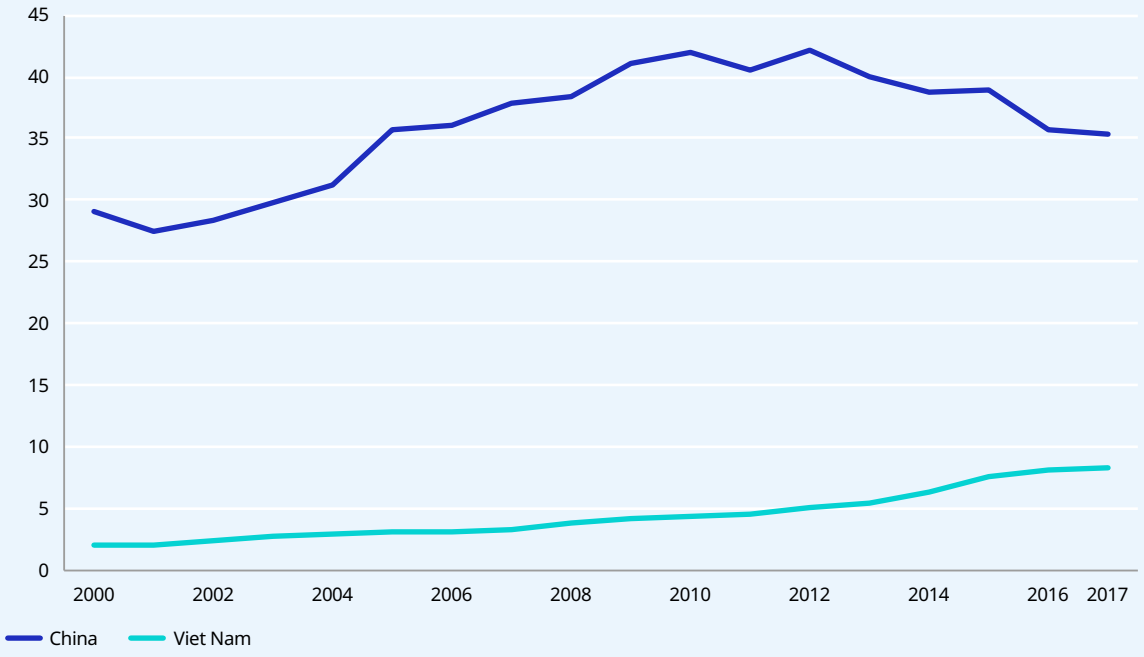


shown in figure 6.4 (with chemicals, basic metals and machinery being the exceptions). The results on wearing apparel in both figures 6.3 and 6.4 are particularly noteworthy, because they correspond to the observation that the biggest exporters in this industry also have very weak TUR. Indeed, China and Viet Nam are most notable as the world's two largest apparel exporters (UNCTAD, n.d.). Yet, as noted, results without exporter fixed effects likely suffer from omitted variable bias, which is why we regard results with exporter fixed effects as more definitive.

When we include exporter fixed effects, industry-level results change substantially, except in one scenario: as with industry-level results without exporter fixed effects, we find no clear patterns with respect to the labour intensity of production. Consistent with aggregate-level results, coefficient estimates on industry-level results are generally smaller including exporter fixed effects. For the full sample of countries, we find statistically significant positive coefficient estimates at the 5-per-cent level on the overall TUR indicator for just three of the 17 industries: *electrical machinery*; *medical, etc.*; and *transport equipmen*t – none of which is classified as labour-intensive. In other words, for these three industries, stronger overall TUR are associated with lower exports. However, we have seen at the aggregate level, that results change considerably when we drop Japan from the sample of exporters. When doing so, we find a statistically significant positive coefficient estimate at the 5-per-cent level for only one industry: *medical, etc.* For the full sample and for the sample dropping Japan, we find statistically significant negative coefficient estimates on the overall TUR indicator for two industries: *basic metals* and *office machinery*.

For the sample of countries excluding high-income countries as exporters – and consistent with the results on aggregate goods exports – the only statistically significant industry-level coefficient estimates are negative, meaning that stronger overall TUR are associated with higher exports. This holds for six of the 17 industries: *paper products*; *rubber and plastics*; *basic metals*; *machinery*; *office machinery*; and *transport equipment*. Notably, when including exporter fixed effects, we no longer find statistically significant coefficient estimates for the wearing apparel industry for either the full sample

▶ **Figure 6.5. Shares of China and Viet Nam in world wearing apparel exports, 2000–17**
(percentage)



Source: CEPII, "BACI Trade Data".

of countries or excluding high-income countries as exporters.

In a narrow technical sense, this is unsurprising given that China and Viet Nam show no variation in the overall TUR indicator over the 2000 to 2015 period and so, effectively drop out of the analysis with the inclusion of exporter fixed effects. But a more substantive understanding of the impacts of TUR is suggested by comparing patterns of wearing apparel exports for China and Viet Nam, which is shown in figure 6.5 as their respective share of world exports for the industry. While there is a steady increase in this measure for Viet Nam, for China the measure reaches maximum values of 42.1 per cent in 2010 and 2012, and then declines steadily, dropping to 35.4 per cent in 2017.

It is not evident how to explain these movements in opposite directions if TUR were a decisive determinant of wearing apparel exports. Rather, these movements are linked through other factors, as multinationals in the industry shifted production from China to Viet Nam in particular, but also to other countries in South-Eastern Asia in the face of rising wage and non-wage labour costs in China (Chen and Li 2019). The relocation of production in the industry occurred not only between China and Viet Nam but within China, from export-oriented coastal regions to inland regions catering to the domestic market, in what Chen and Li refer to as a process of "dual relocation" (Chen and Li 2019, 6). These developments occurred in the broader context of Chinese Government policies (as embodied in the 11th and 12th five-year plans of 2006 and 2011, for example) advocating shifts towards more high-technology, emerging industries and away from labour-intensive industries, like the wearing apparel industry (Chen and Li 2019; Liu 2023).

> There is no evidence of a relationship between TUR and exports for wearing apparel, the most labour-intensive as well as female-intensive of industries.

These shifts occurred as part of the Government's strategy to address the "internal imbalance between consumption and investment in the domestic economy", made more pressing by exposure to the global financial crisis of 2008–09 (Fang, Wang and Yue 2009, 209). The causes of rising labour costs in China are debated and may include such factors as government policies on public investment and "land finance". What is relevant in this context, though, is that labour costs did not rise as a result of stronger TUR (Yang, Zhu and Ren 2023). In this sense, the lack of a generally statistically significant relationship between TUR and wearing apparel exports over time within countries is consistent with what we observe in the critical cases of China and Viet Nam.

6.7. Conclusion

The empirical literature on the effects of TUR on trade essentially died out in the mid-2000s, more likely as a result of a lack of credible indicators of TUR than of relevance, especially considering the growing number of PTAs containing labour provisions (Raess and Sari 2018). Our chapter picks up where this literature left off, making a novel contribution by applying a best practice (PPML) estimator in a panel data gravity model for a large sample of exporting and importing countries (161 and 209, respectively), looking at goods exports at the aggregate level and broken down by 17 industries varying by the labour intensity of production. Moreover, it is the first paper to address this question using Kucera and Sari's (2019) TUR indicators distinguishing between overall TUR and TUR in law and in practice.

In baseline regressions driven by change over time within countries, the chapter does not find robust evidence of a relationship – positive or negative – between TUR and aggregate goods exports. The result is particularly clear-cut for the sample of low- and middle-income countries as exporters – a finding worth emphasizing, as these countries are of key concern in the trade and labour standards debates as well as the prior empirical literature surveyed above. For the full sample of countries as exporters, the finding of a statistically significant negative relationship between stronger overall TUR and aggregate goods exports no longer holds when dropping just one country as an exporter from the sample: Japan. The point is not just that the case of Japan is unrepresentative of the sample. Even within Japan, this relationship appears spurious, as

the strengthening of TUR pertains not to workers in tradable sectors but rather to railway and postal workers and workers in national medical institutions in the public sector.

In baseline regressions at the industry level for the sample of low- and middle-income countries as exporters, we have observed that the six industries with statistically significant results show that stronger TUR are associated with higher exports. But also notable (for either sample of countries) is that there is no evidence of a relationship between TUR and exports for wearing apparel, the most labour-intensive as well as female-intensive of industries and prominent in the trade and labour standards debates, as it has long provided a strategic entry point for developing countries into global markets. The world's two largest exporters in the industry are China and Viet Nam, which had the weakest possible TUR as measured by the TUR indicators. The TUR indicators were also unchanged for these countries over the years addressed and, so, effectively drop out of the analysis when focusing on change over time within countries. As such, we compare wearing apparel exports for China and Viet Nam as shares of world exports for the industry and note steady increases for Viet Nam but marked declines for China after around 2010. We describe how this divergence results from multinationals shifting production from China to Viet Nam in the face of rising labour costs in China. These resulted from factors other than stronger TUR and occurred in the context of the Chinese Government's strategies to shift from labour-intensive towards high-technology, emerging industries and more consumption-driven domestic demand. The critical cases of China and Viet Nam are thus consistent with the lack of a general relationship over time within countries between TUR and wearing apparel exports.

While the findings of our chapter might be read as non-results, the critical literature on publication bias suggests that such an interpretation is misguided. More specifically, we think the findings of our study qualify for the useful category of what Joober et al. (2012) refer to as "exploratory negative results", defined as a "well-designed and adequately powered study with neutral or opposite [from motivating hypotheses] results based on exploratory data analysis" (151). In this sense, our study is useful for what it credibly does not find. To recapitulate, our study does not find evidence in support of the view that countries that weaken TUR will benefit from increased exports and, conversely, that countries that strengthen TUR will suffer from decreased exports. Of course, one could just as well say that our study does not find evidence in support of the view that countries that weaken TUR will suffer from *decreased* exports and that countries that strengthen TUR will benefit from *increased* exports. Yet, the prior formulation is aligned with the ILO's Declaration on Fundamental Principles and Rights at Work, as described in section 6.1. In any case, our study does not find evidence of a race-to-the-bottom dynamic with respect to trade and TUR. While it takes a body of studies to arrive at a more definitive view, our results suggest that – at least with respect to export competitiveness – countries can pursue the high road of strengthening TUR on their own terms, with associated benefits for the well-being of workers. Insofar as stronger TUR result in stronger unions, we have referred to studies showing that unions not only raise wages for union members but also reduce overall wage inequality. Stronger TUR can thus be an important corrective to the long-run global decline in labour shares of income that has been the subject of much concern and debate (Grossman and Oberfield 2021; ILO 2019; Stockhammer 2017).

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Appendix 1. Trade model data and the model and estimation method

Trade model data

The bilateral trade data used to construct our dependent variable are from the Base pour l'Analyse du Commerce International (BACI) database of the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)[73] (Gaulier and Zignago 2010). The variable is constructed using three-year averages for the 2000–17 period. For example, the TUR indicators for 2015 are matched with the average of export values for 2015, 2016 and 2017.[74] Our geographic and distance control variables are also from the CEPII database[75] (Mayer and Zignago 2011). The control variable for regional trade agreements is from Mario Larch's Regional Trade Agreements Database[76] (Egger and Larch 2008). GDP per capita and population data are from the World Bank's World Development Indicators.[77] After merging all datasets together, our panel consists of 161 exporting and 209 importing countries and territories (see table A1.1 for the list).[78]

73 See the BACI database.

74 When matching the trade data with the TUR data, we matched South Africa with the Southern African Custom's Union and Belgium with Belgium–Luxembourg trade data. As a robustness check, we also matched the TUR indicators with lagged two-year averages. For example, the TUR indicators for 2015 were matched with trade data for 2016 and 2017. Baseline results did not vary substantively.

75 See the GeoDist database.

76 See Mario Larch's Regional Trade Agreements Database.

77 See the World Bank's World Development Indicators.

78 Not all exporting countries are in the data for all years of the panel. Our data include 158 countries for 2000, 158 for 2005, 161 for 2009, 160 for 2012, and 158 for 2015.

▶ Table A1.1. Countries and territories included in the sample

Exporters			Importers
Albania	Greece	Panama	Afghanistan
Algeria	Grenada	Papua New Guinea	Albania
Antigua and Barbuda	Guatemala	Paraguay	Algeria
Argentina	Guinea-Bissau	Peru	Andorra
Armenia	Guyana	Philippines	Angola
Australia	Haiti	Poland	Anguilla
Austria	Honduras	Portugal	Antigua and Barbuda
Bahamas	Hungary	Qatar	Argentina
Bahrain	Iceland	Rep. of Korea	Armenia
Bangladesh	India	Rep. of Moldova	Aruba
Barbados	Indonesia	Romania	Australia
Belarus	Iran (Islamic Rep. of)	Russian Federation	Austria
Belgium–Luxembourg	Iraq	Rwanda	Azerbaijan
Belize	Ireland	Saint Kitts and Nevis	Bahamas
Benin	Israel	Saint Lucia	Bahrain
Bolivia (Plurinational State of)	Italy	Saint Vincent and the Grenadines	Bangladesh
Bosnia and Herzegovina	Jamaica	Samoa	Barbados
Brazil	Japan	San Marino	Belarus
Brunei Darussalam	Jordan	Sao Tome and Principe	Belgium–Luxembourg
Bulgaria	Kazakhstan	Saudi Arabia	Belize
Burkina Faso	Kenya	Senegal	Benin
Burundi	Kiribati	Seychelles	Bermuda
Cabo Verde	Kuwait	Sierra Leone	Bhutan
Cambodia	Lao People's Dem. Rep.	Singapore	Bolivia (Plurinational State of)
Cameroon	Latvia	Slovakia	Bosnia and Herzegovina
Canada	Lebanon	Slovenia	Brazil
Central African Republic	Liberia	Solomon Islands	British Virgin Islands
Chile	Libya	South Africa	Brunei Darussalam
China	Lithuania	Spain	Bulgaria
Colombia	Madagascar	Sri Lanka	Burkina Faso
Comoros	Malawi	Suriname	Burundi
Costa Rica	Malaysia	Sweden	Cabo Verde
Côte d'Ivoire	Mali	Switzerland	Cambodia
Croatia	Malta	Thailand	Cameroon
Cuba	Marshall Islands	Timor-Leste	Canada
Cyprus	Mauritania	Togo	Cayman Islands
Czechia	Mauritius	Trinidad and Tobago	Central African Republic
Dem. Rep. of the Congo	Mexico	Tunisia	Chad
Denmark	Mongolia	Türkiye	Chile
Dominica	Montenegro	Turkmenistan	China
Dominican Republic	Morocco	Tuvalu	Christmas Island
Ecuador	Mozambique	Uganda	Cocos Islands
Egypt	Myanmar	Ukraine	Colombia
El Salvador	Nepal	United Arab Emirates	Comoros
Equatorial Guinea	Netherlands	United Kingdom	Congo
Eritrea	New Zealand	United Rep. of Tanzania	Cook Islands
Estonia	Nicaragua	United States	Costa Rica
Ethiopia	Niger	Uruguay	Côte d'Ivoire
Fiji	Nigeria	Uzbekistan	Croatia
Finland	North Macedonia	Vanuatu	Cuba
France	Norway	Venezuela (Bolivarian Rep. of)	Cyprus
Georgia	Oman	Viet Nam	Czechia
Germany	Pakistan	Zambia	Dem. People's Rep. of Korea
Ghana	Palau	Zimbabwe	

Dem. Rep. of the Congo	Liberia	Saint Kitts and Nevis
Denmark	Libya	Saint Lucia
Djibouti	Lithuania	Saint Pierre and Miquelon
Dominica	Macao, China	Saint Vincent and the Grenadines
Dominican Republic	Madagascar	Samoa
Ecuador	Malawi	San Marino
Egypt	Malaysia	Sao Tome and Principe
El Salvador	Maldives	Saudi Arabia
Equatorial Guinea	Mali	Senegal
Eritrea	Malta	Serbia
Estonia	Marshall Islands	Seychelles
Ethiopia	Mauritania	Sierra Leone
Falkland Islands (Malvinas)	Mauritius	Singapore
Fiji	Mexico	Slovakia
Finland	Micronesia	Slovenia
France	Mongolia	Solomon Islands
French Polynesia	Montenegro	Somalia
Gabon	Montserrat	South African Customs Union
Gambia	Morocco	Spain
Georgia	Mozambique	Sri Lanka
Germany	Myanmar	Suriname
Ghana	Nauru	Sweden
Gibraltar	Nepal	Switzerland
Greece	Netherlands	Syrian Arab Republic
Greenland	Netherlands Antilles	Tajikistan
Grenada	New Caledonia	Thailand
Guatemala	New Zealand	Timor-Leste
Guinea	Nicaragua	Togo
Guinea-Bissau	Niger	Tokelau
Guyana	Nigeria	Tonga
Haiti	Niue	Trinidad and Tobago
Honduras	Norfolk Island	Tunisia
Hong Kong, China	North Macedonia	Türkiye
Hungary	Northern Mariana Islands	Turkmenistan
Iceland	Norway	Turks and Caicos Islands
India	Oman	Tuvalu
Indonesia	Pakistan	Uganda
Iran (Islamic Rep. of)	Palau	Ukraine
Iraq	Panama	United Arab Emirates
Ireland	Papua New Guinea	United Kingdom
Israel	Paraguay	United Rep. of Tanzania
Italy	Peru	United States
Jamaica	Philippines	Uruguay
Japan	Pitcairn Islands	Uzbekistan
Jordan	Poland	Vanuatu
Kazakhstan	Portugal	Venezuela (Bolivarian Rep. of)
Kenya	Qatar	Viet Nam
Kiribati	Rep. of Korea	Wallis and Futuna
Kuwait	Rep. of Moldova	Yemen
Kyrgyzstan	Romania	Zambia
Lao People's Dem. Rep.	Russian Federation	Zimbabwe
Latvia	Rwanda	
Lebanon	Saint Helena	

The model and estimation method

Modelling bilateral trade flows raises several challenges. Key among these are the large number of zeros and the heteroskedascity of the trade data.[79] To address these concerns we follow the recommendations of Yotov et al. (2016) and estimate a bilateral gravity model with a PPML estimator, which has become the accepted convention in recent trade studies (for example, Álvarez et al. 2018; Anderson and Yotov 2016; Beverelli et al. 2018; Francois and Manchin 2013).[80]

Another concern is omitted variable bias. When estimating the impact of trade policies, such as regional trade agreements, this concern can be addressed by including pair-year fixed effects[81] (Yotov et al. 2016). However, pair-year fixed effects are not suitable for our estimation, given that we are measuring the impact of an exporter-year specific characteristic (TUR) on the value of exports. In addition to the intersectional effect, pair-year fixed effects create both importer-year and exporter-year fixed effects. As such, pair-year fixed effects would prevent us from being able to estimate the impact of an exporter-year characteristic. We therefore use importer-year fixed effects and separate exporter fixed effects (without interacting with the year) in our baseline specification, analogous to the exporter-year fixed effect approach used by Álvarez et al. (2018) in their study of the impact of importer-specific characteristics on international trade. We include relevant exporter-year characteristics (such as GDP per capita and population) and pairwise characteristics (such as distance) as controls consistent with the gravity model. Note that importer-year fixed effects create controls for global time trends (for example, controlling for the 2008–09 trade collapse) and for time-invariant importer characteristics (for example, importer region) in addition to importer-specific time trends (for example importer GDP per capita). This model allows exporter-year characteristics, such as TUR and democracy rights, to vary but controls for many unobserved trade costs and unobserved exporter characteristics, thus lessening the problem of omitted variable bias.

Our preferred specification is estimated as:

$$trade_{ijkt} = turtl_{jt} + \ln(GDP/cap_{jt}) + \ln population_{jt} + RTA_{jkt} + \ln distance_{jk} + contiguity_{jk} + comlang_{jk} + colrelation_{jk} + IY_{kt} + X_j + cons + \varepsilon$$

where:

- $trade_{jikt}$ is the value of exports (in billions of constant 2010 US$) averaged for years t, t+1, and t+2 for industry i for country j exporting to country k;
- $turtl_{jt}$ is the overall TUR indicator for country j in year t;[82]
- $GDP/cap_{jt.}$ is the GDP per capita for country j in year t;
- $population_{jt}$ is the population for country j in year t;
- RTA_{jkt} has a value of 1 if there was a regional trade agreement between exporting country j and importer country k in year t;
- $distance_{jk}$ is the distance (in kilometres) between exporting country j and importing country k;
- $contiguity_{jk}$ has a value of 1 if exporting country j and importing country k have a common border;
- $comlang_{jk}$ has a value of 1 if exporting country j and importing country k have a common language;
- $colrelation_{jk}$ has a value of 1 if exporting country j and importing country k had a colonial relationship;
- IY_{kt} is a vector of (importer country k) × (year t) dummies;
- X_j is a vector of exporter country j dummies.

Our use of a dependent variable incorporating lags and importer-year and exporter fixed effects provide a means of addressing endogeneity, similar

79 The share of zeros in our data is 22 per cent for total trade and 53 per cent on average for individual industries.

80 See Santos Silva and Tenreyro (2006) for longer discussion of the PPML estimator for gravity models. A recommended robustness checks for the PPML estimator are the Gamma Pseudo Maximum Likelihood (GPML) (Yotov et al. 2016, 26). Coefficient estimates are identical using the GPML as PPML estimator. Results available upon request.

81 This is constructed by interacting exporter–importer pair with each year to create pair-year fixed effects.

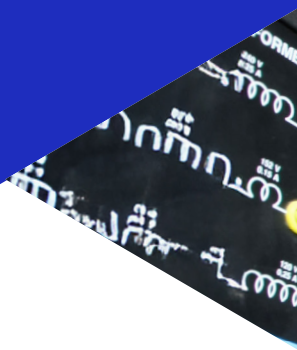
82 We also use the TUR in law and in practice indicators as well as the FH civil liberties and political rights indicators.

to the approaches of Álvarez et al. (2018), Robertson (2021) and Timini, Cortinovis and López Vincente (2022).[83] All standards errors in the regressions are clustered by exporter-importer pairs. We run several different estimations as robustness checks which are discussed below. The descriptive statistics for our main explanatory variables and control variables are shown in table A1.2.

▶ **Table A1.2. Descriptive statistics**

	Mean	Standard deviation	Minimum	Maximum
Trade average (in billions)	0.42	4.56	0	408.74
TUR overall	0.35	0.28	0	1
TUR overall without default scores	0.30	0.20	0	0.84
TUR in law	0.31	0.26	0	1
TUR in practice	0.26	0.28	0	1
FH civil liberties	0.33	0.28	0	1
FH political rights	0.33	0.34	0	1
GDP per capita (log)	8.63	1.47	5.29	11.41
Population (log)	15.79	2.09	9.15	21.04
Regional trade agreement	0.18	0.39	0	1
Distance (log)	8.79	0.79	2.35	9.90
Contiguity	0.01	0.12	0	1
Common language	0.15	0.36	0	1
Colonial relationship	0.01	0.11	0	1

83 We have noted the reasons why we cannot used additional fixed effects (such as pair-year fixed effects) to further address endogeneity – as in Robertson (2021) and Timini, Cortinovis and López Vincente (2022) – as this would prevent us from being able to address our central question of the impact of exporters' TUR on their exports. Our data also do not allow us to apply generalized methods of moments estimator – a widely used method to address endogeneity – given that this requires a regular lag structure in the construction of instruments and that our TUR indicators are only available over irregular years. As we conclude in section 6.7, our chapter also demonstrates a lack of robust results of the impact of TUR rights on exports, thus lessening the need to address endogeneity as an additional test of robustness.



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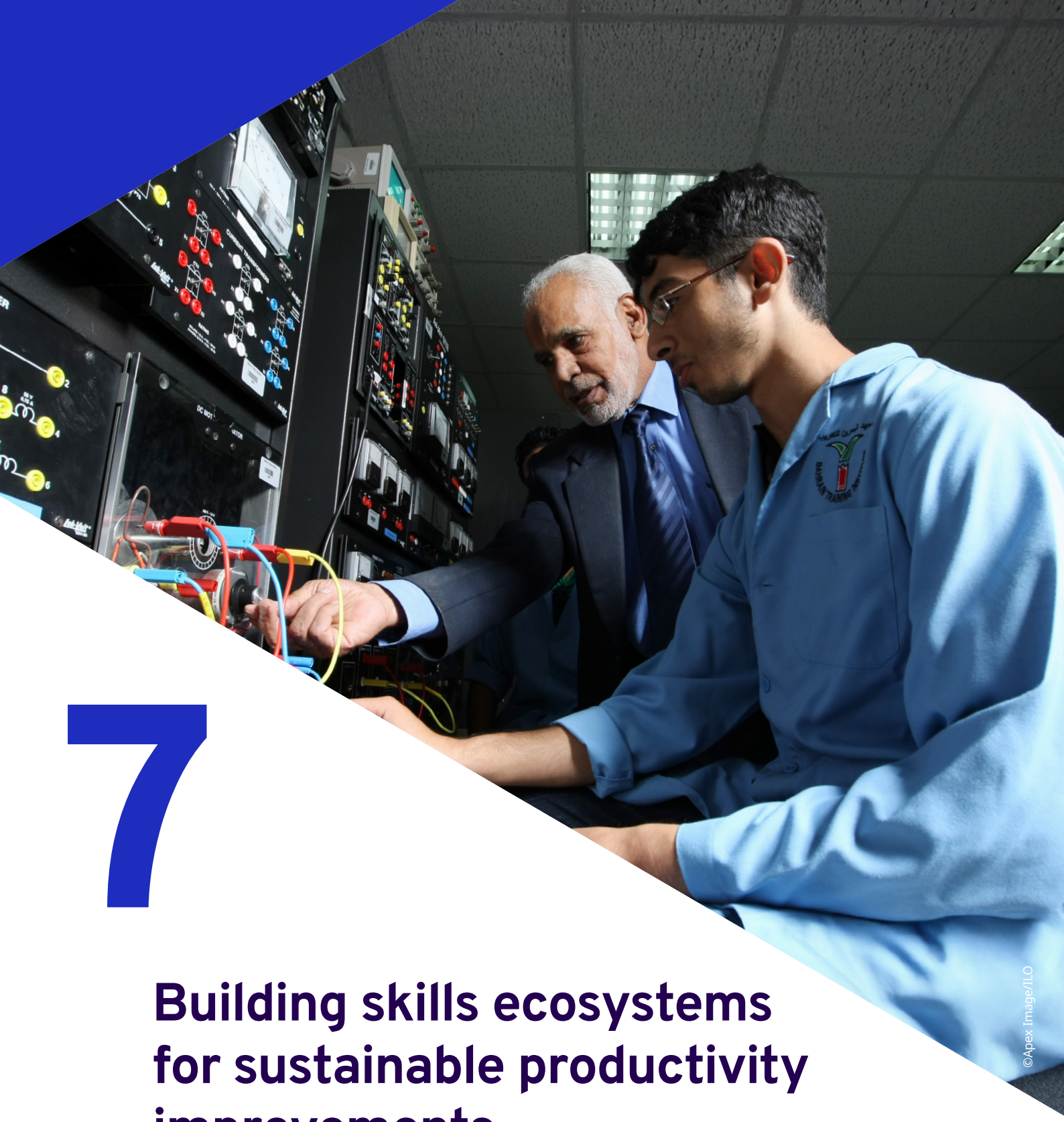


7

Building skills ecosystems for sustainable productivity improvements

Emily Erickson, John Buchanan, E.K. Sarter, Chris Warhurst and Bolormaa Tumurchudur Klok

7.1. Introduction

The transformations of our time – globalization, ageing populations and workforces, climate change and the AI revolution – are serious but not unprecedented. Societies have faced upheavals in the past, dealing with some more successfully than others. In this era of economic and social transformations, countries are looking to skills as a tool for economic growth and social well-being. The role of skills systems in promoting productivity within the context of these transformations is the focus of this chapter.

> Productivity improvements are essential not only for economic growth but also for social development.

Productivity improvements are essential not only for economic growth but also for social development as they enable nations to boost economic output and living standards through more efficient use of resources. This results in higher earnings and improved working conditions, and stronger aggregate demand, creating a virtuous cycle of productivity and DW (ILO 2024). However, too often in the past, short-term productivity gains have resulted from work intensification rather than good use of skills (Green 2004). The task is to develop strategies that provide long-term, sustained productivity improvements. Skills are often seen as a panacea for productivity and economic growth (Keep and Mayhew 2010). Indeed, for many policymakers a simplistic connection between skills supply and productivity has become orthodoxy and much public policy has come to depend on this link (Payne 2017). Framed by human capital theory, the necessity of increasing education and training to boost skill levels is assumed to be a self-evident truth (Buchanan et al. 2017). Yet, the link between skills and productivity is complex and there is no guarantee that rising skills levels (however measured) will deliver economic growth. A key problem is that too many skills acquired by workers are under-used, that is, not deployed (or utilized) in work – whether in high-, or middle- and low-income countries (respectively, Warhurst and Luchinskaya 2019; Allais 2023a).

Policymakers and researchers sceptical of the "more skills equals more productivity" orthodoxy are experimenting with alternative approaches and theoretical frameworks (for example, Cedefop and Eurofound 2023). In this respect, and drawing on the evidence base, we argue that, to better lever the productivity benefits of skills, there is a need to rethink current mainstream skills policy. New policy is needed that is based on better understanding of the supply of and demand for skills, with more targeted emphasis on skill deployment (that is, skill use at work). It also needs to appreciate that skills are not just an individual good but also a collective capability (ILO 2023a) and, relatedly, best operationalized through skill ecosystems sensitive to national contexts. This new policy also must clearly connect with other social and economic policy aims. Taken together, these changes in policy thinking would shift the focus of the skills-for-productivity challenge away from purported individual skill deficits to the need to address systemic issues (Allais 2022). Doing so makes policy changes more holistic and better aligned with broader goals of personal and societal development.

In section 7.2, skills and productivity are put into context based on current and proposed policy discourses and theoretical frameworks. Section 7.3 presents the findings from a review of recent literature on skills policy and practical intervention cases that looks at the micro-, meso- and macro-level relationships between skills and productivity. Section 7.4 provides a summary of their implications and identifies a number of key policy considerations.

7.2. Skills and productivity: Conceptual problems and solutions

How skills and productivity are defined shapes their perceived relationship. This section outlines how skills and productivity are typically conceived and defined in policy. It then offers a more nuanced understanding of skill supply and demand followed by policy suggestions as to how skills might be better harnessed to boost productivity at the firm (micro), regional/sectoral (meso) and national (macro) levels.

7.2.1. Current policy thinking about skills and productivity and their relationship

Human capital theory (HCT), popularized by Becker (1964), equates skills with qualifications, influencing the understanding of the relationship between skills and productivity. In this theory, labour[84] is treated as an input similar to financial and physical capital, but one that can be enhanced by investment in formal education and training. In this sense, HCT regards skills as a resource to be acquired by workers and posits that "investing in education is akin to [investing in] any other factor of production" (Vishnoi 2022).

HCT suggests that workers with higher qualifications are more productive and therefore earn higher pay. This creates a dual "rational calculation", firstly, for individuals to pursue higher qualifications and, secondly, for employers to hire more qualified individuals. Pay is seen as a reflection of an individual's contribution to a firm's productivity. (Brown, Lauder and Cheung 2020).

Skill policy has generally followed the assumptions and logic of HCT, seeing investment in formal education as a key to economic growth. Governments' skill policies worldwide then centre on intervening in the supply side of the labour market by encouraging people and enterprises to make those investments. Believing that human capital is the key driver of productivity, many governments have expanded tertiary education, especially at university level. HCT has thus become a standard policy approach, offering not just a theory of how investment in skills can lead to productivity gains but also a universal theory of economic behaviour based on rational choice and self-interest (Brown, Lauder and Cheung 2020).

Critics of HCT argue that skills investment is influenced by social contexts, including informal learning shaped by community and family, and access to education affected by socio-economic background. These factors create disparities in opportunities and influence individual and employer decisions. The relationship between skills and productivity is complex, involving social and cultural capital, and structural inequalities. A narrow focus on HCT can overlook the broader social benefits of education and its role in addressing inequalities. Furthermore, these critiques highlight the need for a holistic view of human development – such as the capabilities approach (Sen 1999) and the ILO's Decent Work Agenda (ILO 2008) – which emphasize people's capabilities and freedoms, promoting well-being and ensuring that work provides not only income but also meaning, purpose and dignity.

Productivity can also be challenging to define, measure and study. It tends to be defined as the value-added produced in any economy and measured by outputs per unit of input. In general terms, it shows how efficiently economic inputs are converted into outputs (usually in price not quantity terms). The most used measure of productivity is labour productivity, which refers to output per unit of labour input, sometimes per hour worked – in other words, the value-added per worker or the value-added per worker per hour (Bosworth and Warhurst 2021). While these measures are used by government statistical agencies and some researchers, managers of firms tend to think less in terms of productivity and more about efficiency or profits, measured by sales or turnover measured in price not quantity terms.

In both cases, these definitions and measures are outcome-focused. What concerns policymakers are the drivers of productivity. In this respect, cracks have appeared recently in the adequacy of HCT and the assumed link between pay, skill and productivity. The disconnect between pay and productivity is most stark in the growth of "supermanagers" in the Anglo-Saxon economies, demonstrating that skyrocketing

A narrow focus on HCT can overlook the broader social benefits of education and its role in addressing inequalities.

84 The principle that "labour is not a commodity" is foundational to the ILO. This concept, first articulated in the preamble to the ILO's founding documents, underscores the view that workers should be treated with dignity and respect, rather than as mere factors of production. The ILO's Declaration of Philadelphia (1944) reaffirmed this principle, emphasizing that labour is integral to human dignity and well-being.

wage growth is not tied to these managers' skills or their contribution to productivity (Piketty 2018). Moreover, for workers, wages do not just reflect their individual productive capacity but also social norms, labour market opportunities and constraints, the strength of labour market institutions, and differences in market power between capital and labour (Brown, Lauder and Cheung 2020).

A key problem has been separating the contribution of skills to productivity from other factors, such as capital investments, for example, in technology. Total factor productivity, also termed MFP, seeks to address this problem. It aims to measure productivity that is unaccounted for by labour and capital inputs alone. In this respect, it posits that there are three weighted and then aggregated components to productivity: capital, labour and their utilization (Forth and Rincon Aznar 2018).

To focus on skills, it is not just the fact that workers possess skills that leads to productivity but rather how those skills are used in work. As Allais (2023a) states: "the ways in which skills are both developed and deployed are dependent on the organization of work". Combined with technology as capital investment, different production systems use skills in different ways – restrictive or expansive, most obviously.

> In some African countries, expanded education and training sectors result in "educated unemployment"

Two key developments – namely skills mismatch challenges in many countries and the widening definition of "skills" – further expose the simplicity of assuming that more skilled workers axiomatically lead to higher productivity and that qualifications are a good proxy for skills.

Skills mismatch

A skills mismatch between supply and demand is occurring in many countries. For instance, over-qualification occurs when the number of highly educated workers entering the labour market exceeds the number of suitable jobs for these workers. In some African countries, expanded education and training sectors result in "educated unemployment" (McGrath et al. 2020), pushing university graduates to emigrate for better job opportunities. Those who stay face lower wages, reduced job satisfaction and higher turnover, increasing hiring costs for employers (McGuinness, Bergin and Whelan 2018). Relatedly, and important for debates about the drivers of productivity, many workers' skills are then under-utilized in work.

Both managers and workers report that skill under-utilization is more common than skill shortages (Felstead, Gallie and Green 2017). Only 12 per cent of European employers face genuine skill shortages, while 21 to 25 per cent have over-educated workers (Cedefop 2015, McGuinness, Bergin and Whelan 2018). Across 28 European countries, skills under-utilization occurs more frequently than skills deficits (McGuinness, Bergin and Whelan 2018). Similarly, in South Africa, 24.4 per cent of workers are over-qualified for their jobs (OECD 2017). As employer demand for high skills lags behind the supply, a performance gap appears between workers' potential and their actual roles (Livingston 2017).

The prevalence of over-qualification, particularly in developing countries with scarce formal employment, suggests that an oversupply of educated individuals may not lead to higher productivity if the job market cannot absorb and effectively utilize their skills. Therefore, addressing skills mismatch requires a more nuanced approach that considers both supply and demand sides of the labour market and acknowledges that qualifications are an imperfect proxy for the actual skills needed and utilized on the job (ILO 2019a).

The widening definition of skills

"Skill" has become a widened and slippery term, complicating the assumption that skill leads to productivity. While much of the (economics) research following Becker (1964) is based on the human capital approach to skills as qualifications, managers often conceive skills more broadly, to the extent that whatever management says is a skill has become a skill. In these circumstances, skill simply becomes an umbrella term capturing, for example, critical thinking, attitude, loyalty, motivation and having the right accent or appearance (Payne 2017). These unaccredited skills, often called soft skills,

are recognized by employers and policymakers as crucial alongside formal qualifications (Warhurst, Tilly and Gatta 2017).

Despite efforts to classify these skills, such as the ILO's Global Framework on Core Skills (2021a), their unaccredited and ever-widening nature makes quantifying and assessing them challenging.

Consequently, worker productivity is often reduced to being work-ready and simply being able to follow management instructions (Lafer 2004). This issue highlights a critical flaw in human capital approaches, which often places the burden of productivity on individuals. They suggest that workers themselves should "close the gap" in skills and qualifications, implying that personal effort and self-improvement are primary solutions. However, this perspective overlooks the crucial role of policy in supporting skills development, such as the policies that focus on investing in workers' career management skills and enhancing employers' human resource management capacities.

The logic of both developments for productivity is that there needs to be better understanding of the skills demanded by employers, while employer demand for skills needs to be interrogated.

7.2.2. The skill cycle

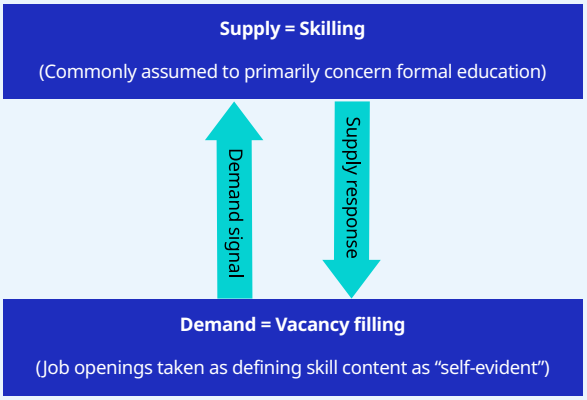
Current skill policy thinking is moving towards recognition that both supply and demand are important and complementary (for example, Cedefop and Eurofound 2023). However, we would argue that supply and demand are both currently conceived too narrowly and too linearly (see also Allais 2023a). Orthodox policy thinking assumes that the skill supply, meaning workers with appropriate qualifications, will be instantly available to meet employer demand as indicated by job vacancies, and decisions made at the point of hiring. This relationship is illustrated in figure 7.1.

In reality, both supply and demand are more nuanced, and their relationship is better conceived as circular, as the skills cycle (James et al. 2013) in figure 7.2 illustrates. This skill cycle challenges the dominant assumption that there is a linear relationship, with demand providing signals in the form of vacancies to which supply responds in the form of skill development. Instead, the relationship between demand and supply is better understood as involving moments in a flow, with at least four distinct elements as shown in figure 7.2. The skill cycle identifies supply and demand each as having two elements. Supply includes both the development (Type I supply) and sourcing (Type II supply) of skill. Skill demand occurs at two points: hire (Type I demand) and use or deployment (Type II demand) as shown in figure 7.2.

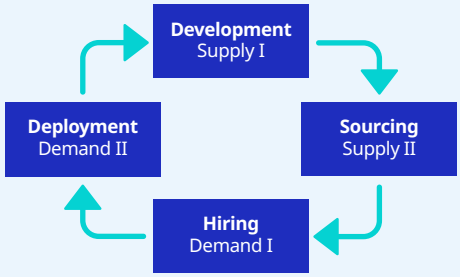
Skills development and skills sourcing

Skill development (Type I supply) covers what, how and where skills are acquired by individuals. Following the orthodoxy of HCT, government intervention focuses on formalized skill development in the form of education and training. Such skill acquisition is important, but it is not the whole story. Skills can also be developed informally both within the workplace – most obviously by workers learning on the job or through guidance by colleagues – as

▶ **Figure 7.1. Orthodox policy of skills as a linear flow**



▶ **Figure 7.2. Skill cycle**



Source: Adapted from James et al. (2013).

well as outside the workplace through family and friends (James et al. 2013) and, increasingly, self-directed through the internet. Informal learning is intentional but not institutionalized and may not lead to formally recognized qualifications (ILO 2023b).

Particularly in developing countries, where a large share of the economy is informal and formal education opportunities are often limited, skills are typically acquired informally and non-formally (Sakamoto and Sung 2018). Informal pathways – including informal apprenticeships, on-the-job training and skills passed down through family and community networks – play a significant role in broadening access to skills. However, integrating informal skills into formal labour markets remains a challenge, particularly regarding quality, relevance and recognition (ILO 2023c). The lack of formal recognition or certification for these skills limits workers' ability to fully leverage them for better employability and productivity. Recognition of prior learning offers a critical pathway for acknowledging informally acquired skills, enhancing worker mobility and employability, and ultimately boosting productivity – especially in developing countries where informal and nonformal learning dominates and formal training access is limited (ILO 2021b).

Skill sourcing (Type II supply) covers how and where employers obtain the skills they need. While skill development is important, it is equally important to consider the pipeline through which employers obtain these skills, known as skills sourcing. Skill gaps can be addressed by training existing employees, redistributing tasks among existing employees to better utilizing current skills, and/or hiring new employees with the necessary skills.[85] Skills can also be obtained by externalizing the source, drawing in temporary agency workers, or through the outsourcing of work to another organization. The transition from education and training to employment is becoming more precarious due to unpaid work, temporary work, involuntary part-time work and unpaid internships (Hunt and Scott 2023). However, skill sourcing receives far less policy attention than skill development. It is essential to distinguish skills sourcing from skills development, as the former involves various policy actions beyond education and training.

Skills demand and skills utilization

The cycle also disaggregates skill demand into two elements. **Hiring** (Type I demand) involves the skills needed to get the job – that is, for a worker to be hired by an employer. Governments usually narrowly focus on this type of demand, again because it is easy to measure when assessing whether supply meets demand (narrowly conceived) in the form of data on vacancies. The focus is usually on whether employers are hiring the higher-skilled workers and then paying them more than less skilled workers and it is framed as a concern with the rate of return on education and training investment (Eurofound 2024).

85 The ILO has various standards which emphasize efficient use of human resources (Employment Policy Recommendation, 1964 (No. 122)), continuous training (Human Resources Development Recommendation, 2004 (No. 195)), matching skill demand with supply (Recommendation No. 195), protection for non-standard workers (Employment Relationship Recommendation, 2006 (No. 198)), and promoting decent work to address skill gaps and precarious employment conditions (Employment and Decent Work for Peace and Resilience Recommendation, 2017 (No. 205)).

However, such measurement is limited. Many employers, faced with a supply of better-qualified applicants, simply hire workers with better qualifications, often without understanding the skills embedded in those qualifications. Research shows that education is not a good proxy for skills used in work (ILO 2019a; McGuinness, Bergin and Whelan 2018). This hiring behaviour creates qualification inflation, where the required skill level to get a job increases (James et al. 2013) without a corresponding increase in task complexity of the job (Anderson and Warhurst 2012).

Skills deployment (Type II demand) focuses on the skills workers need to do the job. The rise in skill demand at the point of hire masks the lack of increased demand for these skills to be deployed within the workplace. This is also referred to as *skill utilization* (Warhurst and Findlay 2012). HCT assumes that skills developed through education and training are used in work, but there is a significant under-use of workers' skills internationally.

Brown, Lauder and Cheung (2020) reframe the story of twenty-first-century economics as a story of job scarcity. The problem, they argue, is a lack of sufficient good jobs that reflect the level of skill possessed by the workforce overall. Qualification inflation and declining returns on educational investment are symptoms of this problem. Gordon's (2016) analysis shows that returns on educational investment depend on economic development, skills utilization and labour demand. Moreover, skill utilization becomes more, not less, important as an economy develops.

Disaggregating skill demand into these two types – the point of hire and point of use – highlights important distinctions in employer behaviour in terms of skill demand. Policymakers often conflate these two types of demand, assuming that hiring skilled workers automatically leads to skills utilization. However, these two types of demand should be disentangled, especially as governments expand tertiary education.

At the aggregate level, some countries face a skills mismatch due to an oversupply of skill, with the volume of highly skilled workers (as proxied by qualifications) coming onto the labour market outstripping the number of suitable jobs for these workers (Brown, Lauder and Cheung 2020) and the skilled but undereducated workers. As Allais (2023a) states "a key cause of the phenomena described as 'skills mismatches' is that the knowledge and skills to do work and the credentials to get a job are different". Qualifications help individuals navigate the labour market but are not necessarily applied or even applicable in any given job.

A key cause of the phenomena described as 'skills mismatches' is that the knowledge and skills to do work and the credentials to get a job are different.

Better skill use results in increases in productivity, wages and returns on education and training, and supports worker well-being (Cedefop and Eurofound 2023). The gap between the hiring and deployment of skills exposes:

- the weakness in mainstream economics thinking about human capital; and
- where the skill-to-productivity problem might lie.

The evidence suggests that more policy attention needs to be placed on Type II demand, recognizing that the deployment of skills can and should influence the skills that are hired, sourced and developed. More generally, therefore, the skills cycle signals that good skill policy needs to appreciate and support this circularity and recognize the integration of its four elements.

7.2.3. Getting the policy balance right at the micro level: Encouraging better use of skills

To effectively use the skills of workers, policies should go beyond viewing skills as an individual good. At these most immediate levels of economic and social life, issues of effective skill development and use are most tangible and often intense. Despite evidence of skill under-use, few national policies address this problem. At best, policy is vague. Instead, as we note above, most policies focus on skill development. It is important but not sufficient for workers to possess skills, they must also have job design that enables them to use these skills,

and policy needs to promote this job design (Keep and Mayhew 2010).

Cedefop and Eurofound (2023) argue that without demand-side policies, the benefits of supply-side policies do not fully materialize. The challenge lies in defining what demand-side policy looks like within firms and workplaces. A useful starting point is promoting high-performance work systems (HPWS), which include three components: ability, motivation and opportunity – the so-called AMO framework (see table 7.1) (Appelbaum et al. 2000).[86] Effective skills use only occurs when all three components of the AMO framework are in place (Warhurst and Findlay 2012).

It is the bundling of these practices that creates a system and generates performance gains, because their sum is greater than the parts (Harley 2005). With HPWS, firms can elicit "discretionary effort" from workers, and improve business performance, including productivity (Appelbaum et al. 2000; Ashton and Sung 2002). These findings hold across countries, sectors and company sizes (Cedefop and Eurofound 2023). Skills Australia (2012) notes that these practices also offer good job quality, and a recent review of international research shows a positive relationship between good jobs and productivity (Erickson et al. 2024).

Even with government encouragement and support, creating HPWS in workplaces is the responsibility of management. Skill deployment is a crucial piece of the productivity puzzle, alongside quality of management practices. Research shows that higher-quality "people management" has a positive and significant effect on productivity (Bloom and Van Reenen 2007; Bloom, Sadun and Van Reenan 2016). Sung and Ashton (2015) identify two types of managers: people-focused (prioritizing the development and well-being of their employees) and systems-focused (optimizing processes and systems). People-focused managers result in the better use of skills.

Governments often hesitate to intervene in underperforming companies to improve management practices. However, management

▶ **Table 7.1. The AMO approach**

Component	Definition
Ability	Having an appropriately skilled workforce, through recruitment, selection and training. These skills include general as well as occupation- and firm-specific skills and being multi-skilled.
Motivation/incentives	Three types: ▶ extrinsic/financial, meaning gain-sharing reward systems, distilled down to pay-for-performance earnings; ▶ intrinsic, meaning workers being challenged in work, thereby inducing greater satisfaction and commitment; ▶ induced through an organizational climate of trust and workers having long-term stake in the organization.
Opportunity	Workers having substantive participation in work, which requires them having: ▶ responsibility and authority to problem solve; ▶ greater autonomy and control over decisions; ▶ capacity to coordinate and communicate their decisions to the wider organization.

Source: Appelbaum et al. (2000).

86 Appelbaum et al. refer to both "incentives" and "motivations", but "motivations" is used most in subsequent research.

quality is essential for realizing the benefits of workers' skills. Fuller and Unwin (2008) describe skill development and use in workplaces as a continuum from restrictive to expansive.

- Restrictive workplaces focus on immediate on-the-job training, while expansive workplaces nurture a broad range of skills and support off-the-job education.
- Expansive workplaces have long-term skills development, respect employees' learning needs and emphasize teamwork and innovation.

Fuller and Unwin argue it is crucial to engage with three fundamental issues:

- the role of external reference points (such as communities of practices) for defining skills;
- the nature of the skills developed (for example, broadly or narrowly defined); and
- the business setting such as management philosophy and firm structure (for example, the significance of skills for business model success).[87]

An integrated policy and practice approach is needed to support management across all four elements of the skill cycle, but with a particular emphasis on skill deployment for productivity gains. The evidence suggests that HPWS can make a difference to productivity. Currently, however, adoption of HPWS is opportunistic and ad hoc within countries. A strong policy push is needed to encourage not just more HPWS in isolation but, rather, arrangements and cultures that nurture expansive workplaces and protect against the forces that perpetuate restrictive workplaces when it comes to skills development and use. Doing so means that governments must be willing to "get inside the ever-elusive 'black box' of the way firms are managed" (Belt and Giles 2009). How firms are managed in relation to skills is, however, embedded in wider contextual arrangements. It is to a consideration of these arrangements that we now turn.

7.3. Results from a review of the literature and cases of practical interventions

Using the framework of a skills cycle, this section reviews the recent literature on skills policy, highlighting how skills (supply and demand) can drive productivity growth at national (macro), sectoral and regional (meso), and firm (micro) levels and learns from practical examples of interventions across the world.

7.3.1. Micro level issues: The importance of bundles of practice and context

While macro- and meso-level factors are important, productivity through skills is generated at the firm (micro) level. At this level, a set of practices can influence skill development, utilization, training provision and productivity returns.

Recent research on the skill-productivity nexus at the micro level is patchy, often focusing on specific sectors (mostly manufacturing) in particular countries at specific times. Research indicates that small and medium-sized enterprises (SMEs) with good management practices have positive performance outcomes. For example, SMEs in Indonesia's export sector that used good human resource practices exhibit better innovation and performance outcomes (Gede Riana et al. 2020). Similarly, Potjanajaruwit (2020) found that job design, training and other human resource practices enhance productivity in Thai SMEs. Khan (2019) highlighted the importance of organizational ability to utilize skills in the Bangladeshi garment sector. Khan, Kasuma and Ali (2022) found that employee skills boost firm performance and growth, but SMEs often face budget constraints for training, relying on government grants (Percy 2021).

A generalization that arises from work on firm-level practice is that interventions in training should not be conducted in isolation from other human resource practices. The ILO case study of upgrading informal apprenticeships in Jordan's car garages

87 See Fuller and Unwin (2008) and an application of these ideas in the Australian construction industry in Buchanan, Anderson and Power (2017).

▶ Box 7.1. Upgrading informal apprenticeships, Jordan

In Jordan, MSMEs are vital to the economy, particularly in the service sector. Despite their importance, these businesses – especially those in the informal economy – frequently face low productivity and DW deficits. To address these challenges, the ILO piloted a project to upgrade informal apprenticeships in car garages. In collaboration with the International Youth Foundation, the ILO implemented a project in 31 car garages from August 2013 to March 2014. Project main aim was to improve the skills and employability of young apprentices, thereby enhancing the productivity of participating MSMEs. The interventions included short-term training in technical English language skills, workplace management, basic occupational safety and health, and technical skills. The success of the project led to its replication by a private technical and vocation education and training (TVET) Academy based in Amman, with whom the ILO partnered during the pilot.

- **Positive indicators of productivity improvements**: Car garages unanimously agreed that the upgraded apprenticeship programme improved workplace conditions.

- **Hiring new workers**: 47 per cent of surveyed garages hired new workers after the training programme, often between one and three workers. Many also hired apprentices who completed the programme, benefiting enterprise growth and productivity.

- **Winning new customers**: 87 per cent of garages reported gaining new customers due to the programme. Half attributed this to the apprentices' training, which helped expand their customer base and improve service quality.

- **Increasing turnover**: 90 per cent of garages increased their turnover and profits, linked to workforce skill improvements, particularly among apprentices. However, most noted that these gains were recorded before the COVID-19 pandemic.

- **Link between upgraded informal apprenticeships and productivity**: Workforce skills improvement (among both apprentices and car garage owners and/or master craftspersons through a combination of management skills training and the upgraded informal apprenticeships) led to better service quality delivered by the car garages. This improvement in service quality resulted in higher a higher customer satisfaction.

Conclusion: The upgraded informal apprenticeship programme positively impacted both DW outcomes and enterprise productivity. The pilot programme improved young people's employability, reducing their transition from training to employment from five years to less than a year. Recent data from 30 garages (from the subsequent iteration of the programme by the private TVET academy) show that the programme improved workforce skills, service quality, customer satisfaction and, ultimately, turnover and profits.

Key lessons

- For scalability and sustainability, skills interventions should be sector-anchored and part of a broader productivity ecosystem for DW.

- Impact is amplified by integrating skills development with business development and capacity-building for employers.

- Assessing impacts years after intervention helps to understand lasting effects and previously unseen benefits.

Source: ILO (2022).

(see box 7.1) highlights the impact of an integrated skills development approach on productivity. Combining skills training for apprentices with business development and capacity-building for SME owners resulted in better service quality, increased customer satisfaction and higher turnover for the car garages. The case study underscores that such integrated interventions are more likely to yield sustainable and scalable outcomes for productivity.

Similarly, the ILO's SCORE programme enhances productivity and competitiveness among SMEs by supporting the adoption of bundled good practices at the firm level (see box 7.2). Through its practical training and on-site coaching modules, the programme supports SMEs in implementing integrated approaches to workplace cooperation, quality management, cleaner production, human resource development and occupational safety and health (ILO 2023e).

While not citing Applebaum et al. (2000) directly, the above-mentioned studies, as well as these examples of interventions, highlight the continuing relevance of the AMO framework and the need for **bundled practices**.

There is also research based on large data sets that explores the arrangements at the firm level and their impact on organizational performance. One of the key concerns of these studies is the role of management in shaping productivity outcomes at the organizational level. The World Management Survey, conducted over the past two decades, covers four sectors (but primarily manufacturing) in over 35 countries. It examines 18 different types of management practice grouped into four categories: operations, monitoring, targets and incentives. The survey finds that companies with quality practices in these domains have higher productivity (for example, Bloom and Van Reenan 2007; Bloom, Sadun and Van Reenan 2016). Bloom and Van Reenan (2007) also found that clusters of high-quality practices, again particularly human resource (people management) practices, among firms with a highly skilled workforce tended to perform better than firms without such practices. Reflecting on 18 years of work, this research highlights two main points:

- management practices vary widely across and within countries and sectors; and
- management matters in terms of performance, including productivity outcomes (Scur et al. 2021).

The OECD analysed the "human side of productivity" using data from 10 OECD countries, covering thousands of organizations (Criscuolo et al. 2021). This study examined the impact of workforce skills, management structure, and quality and diversity of management and workforce on firm productivity. It found that human factors explained about a third of the productivity gap between the top 10 per cent firms and those in the mid-40- to 60-per-cent range. For instance, the share of highly skilled workers significantly contributed to the superior performance of leading firms, with France showing a 12-per-cent gap and Germany a 3-per-cent gap. This diversity highlights the persistence of differences between French and German firms, identified half a century ago in the seminal Laboratoire d'Économie et de Sociologie du Travail[88] studies by Maurice, Sellier and Silvestre (1986).

However, while there are differences between workplaces, it is often the factors beyond the workplace that deeply impact on organizational level practices within nations. Grimshaw and Miozzo (2021) caution against attributing too much significance to management alone in productivity determination. They argue that there is not one best way of managing workplaces, as firms develop various competences and forms of economic competitiveness.

Arguably more relevant for making sense of both commonality and differences within firms in the same sector at the national level is, again, Fuller and Unwin's (2008) notion of expansive and restrictive workplaces. The way firms approach skills development and use depends on how they are organized:

- their engagement (or not) in communities of practice concerning skills development between firms;
- whether they offer broader transferable (as opposed to narrowly defined) skills; and
- whether their business models are built around nurturing labour expansively or narrowly.

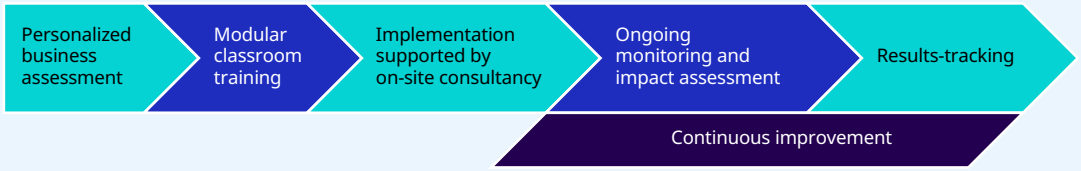
88 The Laboratoire d'Économie et de Sociologie du Travail (Laboratory for the Economics and Sociology of Work) is a research institute in France that focuses on topics such as labour markets, work organization and industrial relations.

▶ Box 7.2. ILO's SCORE programme

The ILO SCORE programme improves productivity and working conditions in SMEs, with a focus on developing cooperative working relations that translate into shared benefits for SME owners, managers and workers. The key intervention of the programme is SCORE training, which demonstrates best international practices in the manufacturing and service sectors and helps SMEs participate in global supply chains. Through a combination of practical classroom training and on-site consulting, SME managers and workers are encouraged to put the training into action in the workplace with the support from industry experts.

Training methodology

The SCORE programme encompasses a wide range of training modules, including workplace cooperation, quality improvement, climate action, workforce management, safety and health at work, gender equality and responsible business. All enterprises start SCORE training with the foundational module, namely "Workplace Cooperation" or "SCORE Basics". Further modules are then selected based on priorities and specific needs of the enterprises and sector. Training for each module begins with a classroom workshop facilitated by an expert. Four to five enterprises are trained together, and each enterprise is represented by four participants: two managers and two workers. After the workshop, experts visit the enterprises to offer advice and support as the training is put into practice. Furthermore, an Enterprise Improvement Team is established within each enterprise. The SCORE training process is illustrated below:



Key results

Since 2009, the SCORE programme has been implemented in over 30 countries across Africa, Asia, Europe, Central Asia, Latin America and the Middle East, with an overall satisfaction rate of 93 per cent. To date, over one million workers and managers in more than 5,800 enterprises have benefited from SCORE training, thanks to the efforts of nearly 1,800 SCORE trainers.

SCORE training has demonstrated capacity to transform SMEs by enhancing their productivity while simultaneously improving working conditions. Participating enterprises not only report increased productivity but also experience reduction in defects, waste and absenteeism, which all contribute to cost savings and more sustainable operations. By creating a more inclusive workplace, reducing worker complaints and accidents, SCORE helps build a more engaged and motivated workforce. Overall, participating enterprises reported significant improvements in a wide range of indicators related to productivity and working conditions.

The impact of the Programme is long-lasting. With the establishment of Enterprise Improvement Teams in each SME, SCORE ensures that the changes implemented are sustained beyond the training period. This team-based approach promotes continuous improvement, helping SMEs stay competitive in an evolving global market.

Source: ILO's SCORE programme.

As confirmed by the cited ILO interventions, it is important to enhance both the quality of management and how managers position their organizations within broader contexts of equity and working conditions, corporate social responsibility and sustainability, and their linkages to broader institutional skills ecosystem.

7.3.2. Macro-level issues: Varieties of skills systems and their reform

At the macro level, research examines how skills supply and demand impact productivity through the concept of skills systems. These systems involve institutions, individuals and policies that address the creation and use of skills within an economy (ILO, World Bank and UNESCO 2023; OECD 2020). They encompass more than skills development and delivery – including occupational ability and movement; access to skill development opportunities; transitions from school to work, between jobs or in and out of employment; skills matching and utilization at work; and governance arrangements.

Comparative research shows significant differences in skills systems. A key focus has been how countries develop and deploy workers at the "intermediate" skill level, typically acquired through apprenticeships. This segment of the labour market is above standard school level but below degree level qualifications. The National Institute for Economic Research in the United Kingdom has conducted leading studies in this area (for example, Mason, O'Mahony and Riley 2018).[89] Their research,[90] comparing firms in France Germany, the Netherlands and the United Kingdom in the 1980s and 1990s, found that skills levels contribute to labour productivity in various ways. For example, German apprenticeship-trained workers could propose and implement modifications to job design which resulted in improved productivity, while British managers' time was spent firefighting due to a lack of intermediate skills (Mason, O'Mahony and Riley 2018). Cedefop (2014) found that the United Kingdom, facing a productivity challenge, had a comparatively small share of workers with intermediate vocational qualifications compared to France and Germany, suggesting that the mix of skills had implications for productivity.

Researchers also explore how national skills systems relate to broader productivity regimes, particularly in the varieties of capitalism literature. Hall and Soskice (2001) identified two distinct models of market economy: liberal and the coordinated. These models differ in corporate governance and finance, inter-firm relations, industrial relations, and education and training. Research comparing systems in Germany and the United States found that both achieve high productivity through very different arrangements. Highly productive economies can have elitist education systems (for example, the United States) or tracked vocational education systems (for example, Denmark, Germany and Switzerland) that provide quality skill formation for intermediate-skilled workers.

Table 7.2 summarizes the key features of "collective" and "liberal" skill formation systems. Collective systems rely on coordination via labour market institutions and strong public support for TVET, with firms actively involved in the provision and financing of initial vocational training, and active participation of social partners (Pan, Chen and Zhan 2020). In liberal systems, skill formation is market-driven, with firms independently coordinating their activities, the state playing a subordinate role and policies being responsive rather than proactive (Busemeyer and Trampush 2012; Pan, Chen and Zhan 2020).

The OECD (2020) highlights the need for a nuanced understanding of the different families of countries based on their approaches to skill formation and use. Within coordinated market economies, it identifies at least five different variants: an Asian (or segmentationist) model, a Scandinavian (or social democratic) model, a Central European (or "grand coalition" corporatist) model, a Southern European (or weak corporatist/state supported) model and an Eastern European (or neoliberal variant of a statist) model.

Clarke, Westerhuis and Winch (2021) emphasize the importance of recognizing the diversity of national

89 It is important to recognize that much of the original work associated with understanding the nature and significance of intermediate level work and workers for productivity was undertaken by French and German research. The work of Maurice, Sellier and Silvestre (1986) in France and Lutz (1976) in Germany was especially important.

90 Matched plant studies compare samples of firms or companies with similar, or matched, characteristics. See, for example, Mason, Prais and van Ark's (1992) study of vocational education and productivity in matched manufacturing facilities in the Netherlands and the United Kingdom.

▶ **Table 7.2. Comparative skill formation systems**

Formation system	Characterization
Collective skill formation systems	▶ Coordination via labour market institutions (employers' associations, unions and government agencies, including public employment services) ▶ High public commitment to TVET ▶ Heavy firm involvement in TVET
Liberal skill formation systems	▶ Firms coordinate their activities within fluid markets ▶ Skill formation is delegated to the market ▶ State takes a subordinate role – policies are responsive not proactive

Source: Based on Busemeyer and Trampush (2012) and Pan, Chen and Zhan (2020).

experiences in skills formation. Their comparative research on qualification structures and labour market links identifies four key issues in national skills systems:

- the organization of the formal education system;
- notions of "competence" informing how labour is understood as productive;
- the role of stakeholders in system governance; and
- skills system engagement with labour market segmentation at the national level.

Despite differences in the literature on national skills systems, a common finding is that there is no one best way to organize them. Strong and weak productivity outcomes are associated with various skills systems, and no one system is inherently superior. However, research on reforming skills systems identifies overarching good practices: policy coherence, initiatives appropriate for a particular national setting (that is, not pursuing an assumed superior model) and realistic expectations for stakeholders, especially employers and educators.

Policy coherence

Aligning skills policies with other policy priorities is a universal challenge, requiring policy coherence to address conflicting goals and ensure effectiveness, especially when resources are scarce. Skills policies are not operated in isolation; they are strategically important for a broader economic and industrial strategy, employment, climate, trade and investment policies (ILO 2019b, 2021b, 2023d). This integrated approach is particularly vital for successfully navigating major changes like digitalization and the green transition, ensuring skills policies support productivity growth, economic goals and social equity. Moreover, the ILO's *Strategy on Skills and Lifelong Learning 2030* outlines a comprehensive and integrated approach to strengthening skills systems globally. It serves as a key framework for ensuring policy coherence across education, employment and social development to support inclusive and sustainable development (ILO 2023f).

The ILO and UNESCO (2018) emphasize the importance of a coordinated approach to enhance policy coherence across various domains and government levels. This approach addresses the diverse needs of the labour market and promotes inclusive economic growth through inter-ministerial collaboration, optimizing resource allocation and reducing policy fragmentation. Sung (2006) illustrates this with Singapore, where skills were a part of the story of its economic success – but so too were trade, industry and fiscal/monetary policy.

The importance of being sensitive to national specificities

Policy transfer between countries can be challenging. Ignoring local contexts often leads to unsuccessful transfers.[91] Calls to decolonize African vocation education and training systems (Allais 2023b)

91 Although there is only a small literature currently, and outside the scope of this chapter, examining the policy transfer of skills programmes and systems, Buchanan, Henderson and Occhipinti (forthcoming) will help to fill this gap, including a case of North–South and South–South policy transfer within TVET.

emphasize the role of donor states and development agencies in promoting TVET systems that may have worked in one context, but are unsuitable for low- and middle-income countries' skills systems. These systems often only work with larger, formal sector employers, neglecting the large number of employers and workers in the informal sector. Allais (2025) found that South Africa's adoption of Australian and UK governance models in the TVET system was ineffective, reducing the ability of local colleges to respond to local economic demand.

The key is to understand the specific national context and design interventions accordingly. The ILO is increasingly adopting an evolutionist approach that draws on local potential and acknowledges historical effects and path dependence (ILO 2023d).

The OECD's 2020 report on strengthening the governance of skills system argues that countries address challenges based on their circumstances. The report documented six distinct reform initiatives tailored to different contexts. It highlights how initiatives appropriate to local circumstances were devised and implemented. For example, Estonia, characterized by a hybrid neoliberal/statist skills regime, focused on enhancing system coherence through quality digital infrastructure (OECD 2020, Ch. 2). Germany, with a strong neo-corporatist model, implemented the Alliance for Initial Further Education and Training, a coalition of social and state actors (OECD 2020, Ch. 3). The Republic of Korea, representing the Asian variety of capitalism, aimed to improve lifelong learning through state leadership, mobilizing actors at all levels of government, the labour market and the education sector (OECD 2020, Ch. 4).

Stakeholder engagement: the importance of engaging with practical realities

Engaging stakeholders, including social partners, is critical for designing and implementing effective skills policies and strategies, as emphasized by ILO international labour standards, such as the Human Resources Development Convention, 1975 (No. 142), and Recommendations Nos 195 and 208.[92] Involving social partners – employers, workers and their representatives – ensures that skills initiatives are grounded in labour market realities. Social dialogue and collective bargaining, highlighted in Recommendation No. 195, are fundamental principles for developing relevant and high-quality skills systems.

Similarly, OECD (2020) emphasizes that successful skill strategies require ongoing collaborative engagement across multiple stakeholders, including government ministries and agencies, social partners, NGOs and state actors at multiple levels. It recommends coordinating committees to manage risk, disseminate relevant information and check undue influence, ensuring a purposeful approach to skills settlements. A variety of recent studies highlighted the importance of assessing stakeholders' preferences, resources and capabilities, ensuring policies and initiatives reflect labour market realities.

Employers as stakeholders

Employers play a pivotal role in developing and sustaining skills systems through coordination, advocacy and financial support. They contribute to labour market analysis and engage in work-based learning, especially apprenticeships (ILO 2020a). However, challenges – such as limited operational practices and managerial resources – can constrain training delivery. Huddleston and Laczik (2018) document substantial differences in employers' contributions to qualifications development, both in tasks assigned and time required. Employers may not be best positioned to design curricula and qualifications and assessment strategies. Equity issues also arise, with differences in access to training between multinational and domestic. Effective employer involvement is essential but can be uneven, suggesting a need to adapt approaches to their involvement in skills development (ILO 2020b).

Workers as stakeholders

Trade unions play a pivotal role in developing and implementing skills systems at various levels, ensuring that workers' interests are represented and that skills initiatives align with workforce needs. They

92 Convention No. 142 mandates the creation and implementation of comprehensive policies for vocational guidance and training, ensuring they are closely linked with employment needs. Recommendation No. 195 complements Convention No. 142 by providing guidelines on the development of human resources through education, training and lifelong learning. It emphasizes the need for continuous adaptation to the changing labour market to promote employability. Recommendation No. 208 provides guidelines for establishing and maintaining quality apprenticeship programmes, highlighting importance of well-regulated, adequately funded apprenticeships that offer fair remuneration, social protection and lead to recognized qualifications.

advocate for better-quality training programmes through collective bargaining agreements that include provisions for continuous learning and skills upgrading (Mwamadzingo and Chinguwo 2015). Additionally, trade unions help improve working conditions, leading to higher employee motivation and moral. Motivated employees are more productive, as they are more likely to be engaged and committed to their work (Doucouliagos and Laroche 2003). Trade unions face challenges, such as limited resources and capacity to engage effectively in skills initiatives, maintaining consistent engagement and securing sustainable funding for their involvement.

Training sector as a stakeholder

Education and training providers form an industry "in its own right" (Keep 2017). With significant staff, budgets and influence, the skills industry "often has a vested interested in maintaining and promulgating supply-led solutions" (Keep 2017). This may mean that, even when new policy approaches are introduced, there are pressures to revert to the traditional supply model (Buchanan et al. 2017). As such, the training industry, as a vested interest, may work to maintain the status quo rather than implement a step change in skills systems and settlements even if the change would improve productivity. Certainly, there is a need to ensure that education and training providers do not capture skill reform initiatives.

National-level performance is not just an aggregation of organization or firm-level activity. There are positive externalities relevant to skills at the regional and sectoral (meso) levels. The development of better skill ecosystems can nurture these externalities, which will be discussed in section 7.3.3.

7.3.3. Meso-level issue: Positive externalities but serious reform challenges

No national system is homogenous. Sectoral and regional dynamics shape subnational skills systems (Crouch, Finegold and Sako 1999). Skill ecosystems research emphasizes understanding the contexts in which skills are developed and used (Buchanan et al. 2017). While skills and productivity are key features of successful cities and regional economies (Stewart, Yeom and Stewart 2020), productivity must be considered alongside inclusivity and well-being to improve local lives (Tilley et al. 2023). Comparative research from China shows that high skilled workforces drive urban development by improving productivity and generating positive externalities, with a complementarity between high and low skilled labour (Liang and Lu 2019). Urban success is not solely driven by the supply of skills; towns and cities also generate labour demand through consumption, investment and production.

Effective stakeholder collaboration is critical for the success of meso-level initiatives. Examples of collaborative sector level initiatives, such as Brazil's Serviço Nacional de Aprendizagem Industria (SENAI – National Service of Industrial Training) (see box 7.3), demonstrate that targeted skills training boost productivity. SENAI's modular and practical training addresses specific manufacturing needs, resulting in a 10-per-cent average productivity increase and substantial product defect reduction. Strong collaboration among SENAI,[93] ABIMAQ (the Brazilian Association of Machine and Equipment Industry),[94] companies and the government provided essential support and resources, allowing the programme to scale nationally. This approach enhanced technical skills, fostered a culture of continuous improvement, increased employee engagement and promoted operational excellence.

Sectoral approaches to skills development are highly effective (ILO 2021c, 2021d; Wilson, Tarjáni and Rihova 2016). They enable targeted approaches, stakeholder engagement, adaptability and holistic development. Being applied in over 70 sectors of more than 40 countries, the ILO's STED approach is particularly valuable as it supports countries in embedding skills development within broader trade policies, aligning with the needs of key sectors critical for economic diversification, productivity enhancement and growth (Gregg, Jansen and Von Uexkull 2012; ILO 2020c; ILO and WTO 2017).

A key strength of the approach lies in its deep engagement with the specific context of each

93 SENAI is a private and non-profit institution and a network of industry-focused and vocational education, technological support and innovation. It was established in 1942 and is organized in a federal system with one national department and 24 regional departments, which are administered by the National Confederation of the Industry.

94 ABIMAQ was founded in 1975 and represents 9,000 companies throughout the country.

country and sector. It begins with a careful selection of priority sectors based on national development, trade and green strategies, informed by consultations with relevant stakeholders. The diagnostic phase involves a detailed analysis of the sector's business structure, performance and skills landscape, among others, considering factors, such as technology, regulations and competition. This comprehensive understanding, combined with multi-stakeholder engagement, ensures that skills diagnostics and strategies are relevant and effective. Through dynamic and meaningful engagement, stakeholders develop a shared understanding of the issues that need to be addressed. This process leads to concrete recommendations that address both immediate employer skills needs and systemic weaknesses at policy, institutional and enterprise levels.

For example, the ILO's STED-based interventions in Malawi's horticulture sector have empowered women farmers, enhancing agricultural productivity, economic empowerment and social development (see box 7.4). The approach emphasizes in building the capacity of national and sectoral partners, through learning by doing, to proactively anticipate skills needs and challenges, and subsequently develop sectoral skills strategies.

▶ Box 7.3. Driving productivity improvement: The "FIP SENAI Trail" vocational training case study, Brazil

In 2022, a field survey involving 70 industrial MSMEs revealed that 68 per cent of the companies identified labour as a primary constraint for increasing productivity. Key issues included manufacturing, production process management, automation, maintenance and quality. Specific labour-related challenges highlighted were:

- a lack of training/qualification in specific functions;
- high turnover;
- low educational attainment;
- a lack of industrial culture and engagement.

In response to these findings, SENAI, in partnership with ABIMAQ, launched a pilot programme in June 2023 called Industrial Training for Productivity (FIP SENAI Trail). This programme aims to internalize skills through professional training of factory workers, enhancing productivity in industrial companies, training shop floor leaders and promoting a culture of continuous improvement.

In the metal-mechanic sector, 15 companies participated in the programme, with 153 student-professionals in the state of Rio Grande do Sul. The participants were professionals directly involved in the manufacturing process, including roles in manufacturing, quality, maintenance and planning. The programme consisted of modules focused on industrial productivity, covering courses in manufacturing, quality and maintenance, along with a sector-specific module tailored to the company's operational area. The programme began with a practical, on-site class within the company. In the productivity module, students developed technical skills to optimize production processes. The sectoral module allowed students to deepen their knowledge of tools and new technologies specific to the company's industrial sector, with direct application in the work routine. The programme concluded with the measurement of productivity impact indicators.

Key results

The pilot programme yielded significant results, including:

- an average productivity increase of 10 per cent among participating companies;
- reduction in rework and defective products by over 50 per cent in some companies;
- enhanced employees learning, converting losses into financial cost reductions.

Qualitative results included:

- autonomy in replacing and sustaining results;
- enhanced employee engagement;
- improved organizational climate;
- enhanced technical knowledge-sharing;
- foundation for a culture of continuous improvement;
- creation of an environment of operational excellence;
- conscious resource use and identification of productive waste.

Integration into a national programme: Given its alignment with industry challenges, the FIP SENAI Trail was adapted to serve MSMEs and integrated into the Federal Government's new edition of the "Brasil Mais Produtivo" programme, which began in January 2024. In the first six months of the new programme, over 3,100 companies and 15,800 workers registered in the training tracks. This programme aims to serve up to 33,000 companies with productivity and energy efficiency solutions. SENAI offers consulting in lean manufacturing or energy efficiency, with workers participating in semi-face-to-face improvement courses, starting with a distance learning journey.

Conclusion: Professional training is crucial for productivity gains in the industry. Collaboration between SENAI, companies and the government is essential for the success of this initiative. In the first three months of the new programme, over 2,200 companies and 8,000 workers registered in the training tracks. The initial student profile comprised 63 per cent males and 37 per cent females, in with 58 per cent having studied up to high school, and 47 per cent having completed high school.

Key challenges: However, some challenges remain. Companies face difficulties in making employees available for face-to-face activities due to travel costs and operational interruptions. There is also a need for flexibility in designing productivity indicators to reflect the reality of each sector and industry. Additionally, varying skill level among students require greater monitoring by teachers in some cases.

Note: The case study was developed by SENAI and the Federal Government of Brazil. The ILO's CINTERFOR supported in developing and refining the case study.

By focusing on embedding skills within demand-side policies, understanding the context and targeting both short-term and systemic issues, the STED approach provides a powerful gateway tool for developing countries to build more effective and responsive skills systems, contributing to sustainable development, enhanced productivity and positive socio-economic outcomes.

However, STED implementations face challenges. These include limited resources, infrastructure and expertise in many developing countries, which can hinder the implementation of skills development initiatives. This process can be time-consuming, and requires sustained effort and coordination from stakeholders in managing complexities and expectations, aligning goals, maintaining momentum and securing high-level political commitment and engagement from stakeholders. Additionally, achieving policy coherence and coordination among various stakeholders can be difficult, especially in diverse political, economic and social contexts.

Skills ecosystems

The skills ecosystem is vital for understanding the circular flow of skills (figure 7.2) and its institutional context, including at the meso level of regions or sectors. As illustrated in figure 7.3, this flow occurs within a system of institutions and actors – including firms, training and education providers, trade unions and employers' organizations. These actors and institutions – whether proximate (like firms) or in the background (like financial markets) – have different roles, interests, needs and resources. They interact to ensure a holistic approach to skills-for-productivity growth.

Skills ecosystems typically exist as regional or sector social formations where skills are developed, sourced, hired and deployed for productive

Box 7.4. ILO's STED – Empowering women farmers in Malawi

Background context

Within the context of the Malawi's National Export Strategy 2013–18 implementation, the ILO has supported the country through its STED approach in strengthening institutional arrangements for identifying and anticipating skills needs, and for shaping education and training provisions to meet existing and emerging skills needs in horticulture and oilseeds. A national STED task team was established to undertake skills needs assessment in horticulture sector as a pilot. Key stakeholders included the Ministry of Labour, TEVETA, the Ministry of Finance, the Ministry of Trade and Industry, Ministry of Agriculture, ECAM, MCTU and selected enterprises in the target value chain/sector. A tailored STED guide was developed, led by the Department of Planning of the Ministry of Labour, and adopted by stakeholders. After the successful pilot, a first institutionalized STED-based work was undertaken in the dairy sector, led and championed by the Ministry of Finance and Economic Planning.

STED-based interventions on empowering women farmers in horticulture sector

The STED diagnostic process in the horticulture sector revealed that the sector was underdeveloped, with most firms supplying to the domestic market. Issues like low productivity, poor product quality and weak supply chain logistics prevent smallholder farmers from accessing more profitable export markets. Despite the perceived export demand, skills gaps limit the sector's ability to meet both export and domestic needs. Through the diagnostic process, stakeholders codesigned priority recommendations for addressing these challenges, one of which is a comprehensive programme on women empowerment. An integrated programme was designed to empower women farmers through a combination of mutually reinforcing interventions: enhancing their skills in agronomy, financial literacy and business management, while also creating business and market linkages with aggregators through an "outgrower scheme". All interventions were implemented through building strategic partnerships with national and local actors.

Key interventions

- Partnership with Roseberry Farms
  - Women farmers were trained and connected to Roseberry Farms, a medium-sized aggregator.
  - The partnership enabled women farmers to supply high-quality produce to major supermarket chains.
  - Through "outgrower scheme", Roseberry Farms played a crucial role in promoting market linkages and enhancing the farmers' skills to maintain quality, providing hands-on experience.
- Collaboration with the Agricultural Research Unit
  - In partnership with the Ministry of Agriculture Research unit and the Bvumbe Agricultural Research Station, training materials were developed and translated into the local language.
  - Pilot training was delivered to 50 farmers, including 40 women, focusing a diverse set of skills including technical (pest and disease control), financial literacy and business management, through both classroom and fieldwork.
- Scaling through mainstreaming
  - The programme was integrated into the Agriculture Training Extension Services, reaching local farmers.
  - Agriculture Extension Development Officers and lead farmers were trained as trainers to ensure widespread knowledge dissemination.

- Gender empowerment training
  - Training sessions aimed at raising awareness about the vital role of women in the agriculture business were conducted with community leaders and spouses.
  - These sessions fostered a supportive environment for women farmers.

Key impacts

- **Improved productivity and production:** The programme significantly enhanced the productivity and production of women farmers.
- **Market penetration:** Major chain stores, including Shoprite, reduced imports of high-value vegetables from South Africa, as local farmers, through the aggregator, met the supply demand with consistent quality.
- **Stable market and increased profits:** The linkage to Roseberry Farms provided a stable market for women farmers, improving their profit margin and positively impacting their lives and families' well-being.
- **Substitution of imported vegetables:** The programme achieved a substantial substitution of imported vegetables, significantly reducing dependency on imports and promoting local produce.
- **Mindset shift:** Gender equality training with village leaders and spouses led to a positive change in attitudes. The women of the Bvumbwe Chinkwende village became role models to the community.

Broader implications

- **Productivity and economic growth:** Empowering women farmers contributes to overall economic growth by increasing agricultural productivity and household incomes.
- **Import substitution and export potential:** Improved agricultural practices, enhanced productivity and increased production led to import substitution, reducing reliance on imports, and promoting domestic production and enhancing economic sustainability.
- **Social development:** The programme's success demonstrates the importance of gender-inclusive development strategies in achieving the SDGs.

Source: ILO project documents under the STED initiative.

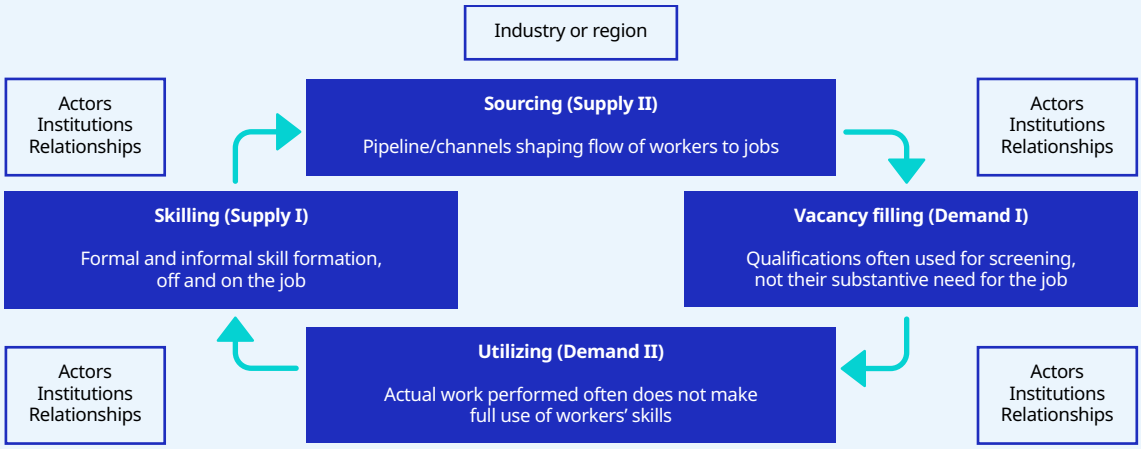
purposes (Anderson and Warhurst 2012; Finegold 1999). Mutual interdependence among actors and institutions is important, with ecosystems providing forums for learning and exchange (Finegold 1999). These relationships are often based on social capital, encompassing the networks, relationships and norms that foster cooperation and trust.

Drawing on biological ecosystems, Finegold (1999) argues that skill ecosystems are self-sustaining and evolve over time due to their strong adaptive capacity. This adaptability is essential in workforce planning because industries, occupations, jobs and skills change over time. Case studies reveal better skill use can be triggered by product market strategies, worker retention issues and government regulation (Skills Australia 2012). Skills ecosystems enable system-wide capacity-building to plan and manage skill in the immediate and longer terms.

"Skills ecosystem thinking" emerged from the need to move beyond national skills systems. Finegold (1999) noted the diversity of arrangements within countries, examining high skill ecosystems in the Silicon Valley and Boston. Many examples have since been identified across various sectors and countries (see Buchanan, Anderson and Power 2017).

Orthodox skills policy often focuses on supply-side interventions to address productivity issues. In contrast, skill ecosystem thinking highlights why skills may not boost productivity, such as poor job design (Buchanan, Anderson and Power 2017) or recruitment problems due to poor working conditions or pay (McGuinness, Bergin and Whelan

Figure 7.3. Skills cycle within a skills ecosystem



2018). Firms collaborate through intermediaries to address these issues by configuring job design, employment arrangements, business strategy and training provision for mutual benefit (Buchanan, Anderson and Power 2017). This approach promotes broader workforce development by improving coordination, leveraging and exploiting the four parts of the skill cycle for productivity gains. This is particularly useful in addressing skill deployment issues (Buchanan, Anderson and Power 2017).

Studies highlight the potential benefits of skills system reform at the meso level. However, there is little literature on effectively designing and implementing such reforms. Buchanan, Anderson and Power (2017) consolidated information on reforms in Australia, Scotland and the United States, noting that enduring examples of reform are rare. They identified key ingredients for success, such as collective self-reliance in Australia, strong leadership in Scotland and sustained resources in the United States.

To maximize the potential of skill ecosystems, several factors are essential:

- They address both labour market and workplace issues and challenges.
- They are based on evidence of what works, why and how.
- Stakeholders commit to a broad agenda of individual, business and local economic interests.
- Interventions are designed for whole regions or industries, not just individual firms.
- They emphasize system-wide capacity-building to plan and manage skills.

Such underpinning requires common understanding and collective action. Ramstad (2009) noted the need for concept agreement, systemic tools, project funding and political (government) and social partners (employers and trade unions) support. Warhurst and Findlay (2012) proposed the ASPiRRE approach, involving actors, structures, a set of protocols that identifies the responsibilities and resources to incentivize change, and the accessing of internal and external expertise. The ILO emphasizes leveraging collective capabilities (ILO 2023a) to address job shortfalls and develop productive capacities. Skills ecosystems provide a tangible means to collectivize these capabilities by creating purposeful interaction among relevant actors and institutions (Alcorso 2006; Windsor and Alcoroso 2008).

States can stimulate skills ecosystems. The developmental states model by Sung and Raddon (2017), exemplified by Singapore, is useful. This model positions the state as the support structure for actors. Developmental states have a national vision, set strategic priorities, develop policies and ensure collaboration between the state, capital and labour – including around skills.

The complexity of cross-national comparisons and internal distinctions by region, sector and firm,

point that skills are not just an individual good but reflect distinct economic, political, cultural and institutional contexts.

7.4. Conclusions and policy implications

The transformations of our time are serious but not unprecedented. Societies have experienced profound upheavals in the past and some have navigated change better than others. Skills systems have often been an integral part of these changes and solutions. The analysis above has identified key issues to consider and the key lessons from a diverse range of experiences.

Section 7.2 provided a nuanced look at the role of skills and productivity beyond the simplistic link of the human capital model, which would conceive skills as a linear relationship between narrowly conceived supply and demand. We presented skills as a circular flow of labour that encompasses four elements of skill: two forms of supply – skills development and sourcing – and two forms of demand – at the point of hire and at the point of use. We emphasized that merely supplying skills is insufficient; effective skills utilization in the workplace is crucial. Under-utilization of skills can hinder productivity and addressing this requires better management within firms. However, what happens inside firms needs to be contextualized.

Section 7.3 applies this circular skills approach to various research and interventions. At the macro level, the context of skills policy is vital, with no singular way to productivity. Regional and sectoral (meso level) research shows positive externalities to skills investment, while firm-level studies (micro level) highlight the importance of context. Employers can shape skills demand and deployment but must foster expansive workplaces and counter restrictive market forces. Skills are thus collective capability within a skills ecosystem.

Skills ecosystems harness the collective capabilities of actors and institutions to address the four elements of the skills cycle. Adopting this approach challenges policymakers to move beyond their comfort zone (Keep 2017). As Anderson and Warhurst (2012, 119) note that skills ecosystem–based policies will be more complex and dynamic than the simplistic "one-stop, quick-fix" supply-side policies. Given the complexity of economies, policymakers must embrace change, as skills supply advocacy has yielded limited productivity gains.

From this work, we identify five implications for policy focused on how skills can help nurture sustainable productivity improvements in a world of multiple transformations.

> Skills ecosystems harness the collective capabilities of actors and institutions to address the four elements of the skills cycle.

7.4.1. Empowering workplaces at the micro level

One of the key conclusions of this chapter is that, if we are interested in how skills policy can assist with improvements in productivity, we need to be aware of the national, regional and sector determinants of economic growth and social well-being. Wider determination does not mean that macro and meso forces dictate what occurs within firms and especially at workplace level. Employers, workers (and their unions) and educators have room for manoeuvre. Applebaum et al.'s (2000) AMO framework is crucial for understanding just what those dimensions of choice are. Fuller and Unwin's (2008) notion of expansive and restrictive workplaces highlights the importance of engaging with wider social factors – such as relevant communities of practice, designing jobs to encourage trust and discretion and making ongoing skills development and use integral and not incidental to workplace operations. Both frameworks help actors in workplaces devise and implement innovations in how skills are developed and deployed day to day.

Policy implications

- Promote the adoption of modern work organization practices that support skill development and deployment, integrated in a wider range of human resources management practices.

- Provide targeted financial support, subsidies and tax incentives to help SMEs invest in workforce skills and improve management capabilities.

- Complement skills policies with management practices that encourage expansive workplaces and integrate human resource practices into business operations.

7.4.2. Embrace complexity of national skills systems

Given the highly complex nature of skills flows at the national level, it is important to be realistic about the scale and pace of change that can be achieved. National skills systems are rarely pure models; they are complex and combine elements from various approaches.

Policy implications

- Recognize that national skills systems are complex, combining successful elements from diverse approaches.

- Identify and adapt successful elements that integrate effectively with a country's unique institutional arrangements and circumstances.

- Ensure effective collaboration and coordination among stakeholders at all levels, aligning skills strategies at the national, regional, sectoral and local levels.

- Maintain coherence in policy implementation, while respecting the unique national context (economic, social, environmental and cultural).

7.4.3. Engage with skills ecosystems at the meso level

Changes at the national level are often advocated but rarely achieved. More common are changes at the regional or sector levels, where the concept of the "skills ecosystem" becomes particularly useful. Addressing the wider determinants of how skills are developed and deployed, rather than relying solely on isolated skills policies, is important beyond national policies. Coordination of sectoral policies across government entities as well as understanding how different public policies interact within sectors are typical challenges.

Policy implications

- Whole-government approach: Promote a strategic whole-government approach to skills development policy, that involves all relevant government sectors.

- Embed skills policies within broader economic and social development policies and strategies, aimed at creating structural economic and social change and demand through evidence-based diagnostic analysis and robust social dialogue (using practical approaches, such as the ILO's STED).

- Support effective stakeholder engagement and dialogue throughout the skills policy cycle.

- Design targeted interventions focused on addressing both immediate skills needs and gaps, and systemic constraints in skills provision.

- Enhance data collection, exchange and use to inform policy decisions.

7.4.4. Embrace collective capabilities over individual human capital

Traditional approaches to skills and productivity have often focused narrowly on individual human capital. However, to drive sustainable productivity enhancements, it is essential to recognize the importance of collective capabilities. Countries need to shift perspectives and adopt a broader socio-economic approach to skills development.

Policy implications

- Recognize that productivity enhancements emerge from collective capabilities within the skills ecosystems and move beyond the traditional human capital approach that views skills as individual goods purchased by firms.

- Adopt policies that engage with the complex reality of skills development and deployment within the skills ecosystem.

7.4.5. Recognize the dynamic nature of skills flows

Understanding of the dynamic and interconnected nature of skills development is critical for designing effective skills policies. Policymakers need to acknowledge the multifaceted and dynamically interconnected nature of skills systems.

Policy implications

- Recognize that skills development is part of circular labour flows, not fixed supply and demand points. Policies should actively engage with these dynamic and interconnected systems.
- Policymakers must go beyond matching supply with demand and engage with labour flows at the national, meso and micro levels.

Actionable recommendations

- Adopt a skills ecosystem framework and shift from linear approaches to a holistic perspective.
- Engage in circular skills cycle by actively engaging with circular flows of skills development and skills utilization.
- Foster collaboration between the government, businesses, education providers, industry associations, employers, trade unions and community organizations.
- Implement forward-looking policies to anticipate and shape future skills needs, considering green transitions, emerging technologies and evolving societal needs.
- Improve the scope, quality and accessibility of labour market data and build stakeholder capacity.

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