International Labour Organization

1919·2019

Global Wage Report 2018/19

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Global Wage Report 2018/19

What lies behind gender pay gaps

INTERNATIONAL LABOUR OFFICE • GENEVA

Global Wage Report 2018/19: What lies behind gender pay gaps

International Labour Office – Geneva: ILO, 2018

ISBN 978-92-2-031346-6 (print)
ISBN 978-92-2-031347-3 (web pdf)

wages / wage differential / wage policy / gender equality / women workers / developed countries / developing countries

13.07

Also available in Chinese: ISBN 978-92-2-132016-6 (print), 978-92-2-132017-3 (web pdf); French: ISBN 978-92-2-031350-3 (print), 978-92-2-031351-0 (web pdf); and Spanish: ISBN 978-92-2-132008-1 (print), 978-92-2-132009-8 (web pdf)

ILO Cataloguing in Publication Data

Cover illustration: © Panos pictures

This publication was produced by the Document and Publications Production, Printing and Distribution Unit (PRODOC) of the ILO.

Graphic and typographic design, manuscript preparation, copy editing, layout and composition, proofreading, printing, electronic publishing and distribution.

PRODOC endeavours to use paper sourced from forests managed in an environmentally sustainable and socially responsible manner.

Code: DTP-WEI-CORR-MUS

Preface

Gender pay gaps represent one of today's greatest social injustices, and I am glad to see that eradicating this injustice has taken on significant momentum in recent times. Central to this effort is Sustainable Development Goal (SDG) target 8.5 which calls, among other things, for equal pay for work of equal value within the framework of the United Nations 2030 Agenda for Sustainable Development. To reinforce the achievement of SDG target 8.5, the ILO, together with UN Women and the OECD, established the Equal Pay International Coalition (EPIC), an initiative to accelerate the closing of the gender pay gap across the world. The success of our efforts is crucial because inequalities within and among countries, including wage inequality, continue to be a significant obstacle to achieving a better and more sustainable future for all.

This year's ILO *Global Wage Report* – the sixth of its series – therefore provides a detailed examination of gender pay inequalities so as to better understand the gender pay gap as a form of unacceptable inequality in the world of work. The report further continues the tradition of previous editions by providing comparative data and information on recent global and regional wage trends. It shows that global wage growth in 2017 was not only lower than in 2016, but fell to its lowest growth rate since 2008, remaining far below the levels observed before the global financial crisis. This remains something of a puzzle given the recent recovery in economic growth and the gradual reduction in unemployment in major countries around the world. And although possible explanations have been offered to solve that puzzle – slow productivity growth and the intensification of global competition, among others – what is now widely recognized is that slow wage growth has become an obstacle to achieving sustainable economic growth. The growing consensus is that improving wages, reducing income inequalities and promoting decent work opportunities continue to be challenges that play a central role if we are to succeed in achieving the UN 2030 Agenda.

The second part of this year's report is devoted to the gender pay gap. Much has been written on the topic and a huge amount of research is aimed at explaining the reasons why men continue to be paid more than women across the world. So why another report? First, this report provides a critical assessment of the standard measures commonly used to estimate gender pay gaps. That assessment leads to a proposal for a new, complementary and simple way of measuring gender pay gaps that we hope will be a useful tool for the purposes of policy-making and for monitoring the evolution of the gender pay gap. Accordingly, the estimates in Part II, which cover some 70 countries and about 80 per cent of wage employees worldwide, show that on average women currently continue to be paid approximately 20 per cent less than men. Second, the report analyses and breaks down gender pay gaps to better understand what lies behind this figure. The evidence shows that, in fact, much of the gender pay gap cannot be explained by any of the

objective labour market characteristics that usually underlie the determination of wages. In high-income countries, for example, almost all of the gender pay gap remains unexplained.

So what could then be the factors that lie behind gender pay gaps? The report shows that education is not, in most countries, the main issue: women wage employees across the world have just as good – if not better – educational attainments than men. However, occupational segregation and the polarization by gender of industries and economic sectors stand out as key factors. Women continue to be under-represented in traditionally male-occupied categories and within similar categories women are consistently paid below men, even if women's educational attainments are just as good or better than those of men in similar occupations. Gender polarization is also an important factor: the report shows that in Europe, for example, working in an enterprise with a predominantly female workforce can bring about a 14.7 per cent wage penalty compared to working in an enterprise with similar productivity attributes but a different gender mix. This 14.7 per cent gap can translate into a loss of about €3,500 (approximately US$4,000) in salary per year for those who work in feminized sectors. Finally, the report shows that motherhood brings about a wage penalty that can persist across a woman's working life while the status of fatherhood is persistently associated with a wage premium.

Part III of the report suggests a number of policy measures to achieve pay parity between women and men. It is my hope that together with the empirical evidence presented earlier in the report, Part III will provide policy-makers, social partners, academics and key stakeholders with a valuable source of information to contribute to eradicating pay inequalities across the world.

Guy Ryder
ILO Director-General

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Acknowledgements

The report was prepared by staff of the Inclusive Labour Markets, Labour Relations and Working Conditions Branch (INWORK) of the ILO with contributions from other ILO colleagues in Geneva and field offices, under the responsibility of Philippe Marcadent, Chief of INWORK. Patrick Belser, Rosalia Vazquez-Alvarez and Ding Xu were the main authors of the report. Patrick Belser provided overall coordination of the report and drafted Part III. Rosalia Vazquez-Alvarez drafted Parts I and II and coordinated the research on the gender pay gap. Ding Xu carried out the data analysis for Part I of the report. Molka Abassi gathered and analysed data for Parts I and II and provided inputs for Part III of the report. Muriel Esposito reviewed recent legal and policy trends and provided inputs for Part III. Chris Edgar coordinated the editing, publication and the anonymous peer review of the entire report. Gillian Somerscales copy-edited the initial draft of the report.

Our special thanks go to Manuela Tomei, Director of the ILO Conditions of Work and Equality Department, who provided extremely helpful suggestions and inputs. ILO specialists in various parts of the world are also acknowledged for their useful comments, including Sevane Ananian (Cairo), Xavier Estupiñan (New Delhi), Daniel Kostzer (Bangkok), Andres Marinakis (Santiago de Chile), Mariko Ouchi (Budapest) and Nicolas Studer (Moscow). Claire Piper is acknowledged for providing excellent secretarial support.

Specific contributions

Part II of the report is based on data cleaned and prepared by Silas Amo-Agyei, Nelly El-Mallakh, Deepti Goel, Anna Lukyanova, Roxana Maurizio, Hanan Nazier, Oksana Nezhyvenko, Neda Trifkovic, Gustavo Vázquez and Jayoung Yoon. The technical peer review for Part II, carried out in addition to the general peer review of the report, was undertaken by Silas Amo-Agyei. Professor Sune Karlsson (Örebro University Business School) is acknowledged for peer reviewing again the entire methodology of Part I in 2017.

Special thanks

Our special thanks go to all the national statistical offices which assisted us with our data collection efforts. We would also like to thank the entire team at ILO/SIALC (Information System and Labour Analysis) in Panama, in particular Bolívar Pino, for providing wage data on Latin America and the Caribbean. Special thanks also go to all those who participated in the two regional workshops organized by Sevane Ananian and aimed at improving the coverage of wage data from African countries in the report. These workshops took place in Cairo, in December 2017, and in Abidjan, in April 2018; in particular, we commend the

support received from the ILO Department of Statistics, the ILO Regional Office for Africa (ROAF) and the ILO Country Office for Côte d'Ivoire in Abidjan.

We would also like to thank the following people for their valuable input and comments: Samia Archella, Maria Arteta, Janine Berg, Florence Bonnet, María José Chamorro, Jae-Hee Chang, Eric Charest, Najati Chosheh, Claire Hobden, Qun Huang, Martine Humblet, Montserrat Lopez, Jon Messenger, Yumi Nabeshima, Rafael Peels, Bimlesh Raj, John Ritchotte, Patricia Roa, Verena Schmidt, Annie Van Klaveren and Jose Luis Viveros Añorve, as well as members of the Interim Steering Committee of EPIC, in particular Patric Aeberhard, Sylvie Durrer, Rósa Guðrún Erlingsdóttir, Byeong Hee Kwon and Salma Nims, in addition to government officials, employer and union representatives from member countries, and international gender experts, for their input in enriching Part III of the report.

Our particular thanks go to two anonymous referees who peer reviewed the report as well as to all internal peer reviewers from various departments of the ILO. Nicole Fortin is gratefully acknowledged for sharing unpublished material that helped the authors of the report to perform the decomposition in Part II.

Executive summary

Part I. Major trends in wages

Lowest wage growth globally in 2017 since 2008

Global wage growth in 2017 was not only lower than in 2016, but fell to its lowest growth rate since 2008, remaining far below the levels obtaining before the global financial crisis. Global wage growth in real terms (that is, adjusted for price inflation) has declined from 2.4 per cent in 2016 to just 1.8 per cent in 2017. If China, whose large population and rapid wage growth significantly influence the global average, is excluded, global wage growth in real terms fell from 1.8 per cent in 2016 to 1.1 per cent in 2017.

Real wage growth is calculated using gross monthly wages, rather than hourly wage rates, which are less frequently available, and fluctuations therefore reflect both hourly wages and the average number of hours worked.

Slow wage growth in high-income countries despite economic recovery and falling unemployment

In the advanced G20 countries, real wage growth declined from 1.7 per cent in 2015 to 0.9 per cent in 2016 and 0.4 per cent in 2017. In Europe (excluding Eastern Europe), real wage growth declined from 1.6 per cent in 2015 to 1.3 per cent in 2016 and further declined to about zero in 2017, owing to lower wage growth in countries including France and Germany, and declining real wages in Italy and Spain; in Eastern Europe, by contrast, real wage growth recovered from its 4.9 per cent decline in 2015 and continued to increase thereafter, from 2.8 per cent in 2016 to 5.0 per cent in 2017. Real wage growth in the United States declined from 2.2 per cent in 2015 to 0.7 per cent in both 2016 and 2017.

Given the recovery in GDP growth and the gradual reduction in unemployment rates in various countries, slow wage growth in high-income countries in 2017 represented somewhat of a puzzle and has been the subject of intense debate. Possible explanations for subdued wage growth include slow productivity growth, the intensification of global competition, the decline in the bargaining power of workers and the inability of unemployment statistics to adequately capture slack in the labour market, as well as an uncertain economic outlook which may have discouraged firms from raising wages.[1]

In view of this low wage growth, it is perhaps not too surprising that the acceleration of economic growth in high-income countries in 2017 was led mainly by higher investment spending, rather than by private consumption.

1. See, for example, OECD, 2018; IMF, 2017.

More robust wage growth in low- and middle-income countries, with much diversity across countries and regions

In emerging and developing countries of the G20, real wage growth has fluctuated in recent years, rising from 2.9 per cent in 2015 to 4.9 per cent in 2016, and then falling back to 4.3 per cent in 2017.

Workers in Asia and the Pacific have enjoyed the highest real wage growth among all regions over the period 2006–17. However, even here wage growth in 2017 was lower than in 2016, falling from 4.8 per cent in 2016 to 3.5 per cent in 2017. Wage growth also declined in Central and Western Asia, from 3.0 per cent in 2016 to 0.5 per cent in 2017. In Latin America and the Caribbean, real wage growth in 2017 increased slightly compared to 2016 but remains relatively low, below the 1 per cent mark. In Africa, where wage data have been collected for the first time for a significant number of countries, real wages appear to have declined overall in 2017 by 3.0 per cent. This is mainly attributable to negative wage trends in Egypt and Nigeria, two large countries which exert a strong influence on our weighted regional average. If these two countries are taken out of the sample, real wages in Africa are estimated to have increased by a moderate 1.3 per cent in 2017.

Taking a longer perspective, real wages between 1999 and 2017 have almost tripled in the emerging and developing countries of the G20, while in advanced G20 countries they have increased by a much lower total of 9 per cent. Yet in many low- and middle-income countries average wages remain low and insufficient to adequately cover the needs of workers and their families.

Wage growth lagging behind productivity growth in high-income countries

Looking at trends in average wages and labour productivity over the period 1999–2017 in 52 high-income countries, the report finds that, on average, labour productivity has increased more rapidly (by a total of 17 per cent) than real wages (13 per cent), although the gap between the two trends narrowed between 2015 and 2017. Overall, the decoupling between wages and labour productivity explains why labour income shares (the share of labour compensation in GDP) in many countries remain substantially below those of the early 1990s.

Wage inequality highest in low-income countries

Using survey data on wages from 64 countries which, together, reflect the wage distribution of about 75 per cent of the world's wage employees, the report finds that the countries with the lowest levels of wage inequality are found among the high-income group, whereas countries with the highest levels of wage inequality are found in the low- and middle-income groups. Among high-income countries, wage inequality is lowest in Sweden and highest in Chile. Among low-income and middle-income countries, South Africa and Namibia have the highest inequality, Armenia and Mongolia the lowest.

Part II. Measuring gender pay gaps and understanding what lies behind them

Measuring the gender pay gap

The raw gender pay gap

Part II of the report provides a global analysis of the gender pay gap. The United Nations SDG target 8.5, which sets out the aim to achieve by 2030 "equal pay for work of equal value", proposes as a main indicator to compare "average hourly earnings of female and male employees" (indicator 8.5.1).

Using average (mean) hourly wages to estimate the gender pay gap, as suggested in SDG indicator 8.5.1, the report finds that – based on data for 73 countries that cover about 80 per cent of the world's employees – the (weighted) global gender pay gap stands at around 16 per cent. There are wide variations among countries, with the mean hourly gender pay gap ranging from 34 per cent in Pakistan to −10.3 per cent in the Philippines (meaning that in this country, women earn on average 10.3 per cent more than men).

However, there are different possible ways to measure raw gender pay gaps. The two measures that are most commonly used are the "mean gender pay gap" (as in the estimate above) and the "median gender pay gap"; the latter compares the value located in the middle of the women's wage distribution with the value located in the middle of the men's wage distribution. Further differences arise when comparisons are made using monthly wages rather than hourly wages. Using these four different combinations (mean/median and hourly/monthly), the report finds that the weighted global estimates range from about 16 per cent to 22 per cent, depending on which measure is used. The gender pay gap of 22 per cent is obtained when using median monthly wages.

A complementary measure: The factor-weighted gender pay gap

The report finds that in most countries – but particularly where the participation of women in wage employment is low – women tend to have different characteristics than men and tend to cluster around specific hourly wages. In a wage distribution characterized by such irregularities, gender pay gap estimates based on a single number, the "mean" or the "median", can be difficult to interpret and may provide information that is of limited use to policy-makers, as they are completely dominated and distorted by this clustering.

The report thus proposes a methodology to generate complementary estimates of the gender pay gap that remove some of the major "composition effects" arising from the existence of these clusters (for example, when women tend to cluster in the public sector or in jobs requiring high levels of education). In essence, this methodology groups women and men wage employees into more homogeneous subgroups, and then estimates the gender pay gap in each subgroup. The methodology then constructs a weighted average of all the subgroups' estimated gender pay gaps, with weights reflecting the size of each subgroup in the total population of wage employees. Using this method, the mean hourly gender pay gap becomes positive in all but two countries, and the mean hourly global gender pay gap increases from about 16 per cent to 19 per cent.

What are the factors that lie behind the gender pay gap?

Estimating the gender pay gap across the hourly wage distribution

The report estimates the hourly gender pay gap at different points in the wage distribution. Among high-income countries, the widening of the gender pay gap at the upper end of the distribution is striking. In contrast, in low- and middle-income countries it is at the low end of the wage distribution – where women are proportionally over-represented – that the gender pay gap is wider. However, there is a common pattern in labour markets across the world: as we move from lower to higher hourly wages the proportion of women declines, in some cases sharply.

What part of the gender pay gap can be "explained" by differences in the attributes and characteristics of women and men in paid employment?

Are men paid more than women because they are better educated, or because they have other observable characteristics or attributes that are associated with higher labour productivity? The report uses methods pioneered by Fortin, Lemieux and Firpo (2011) to decompose the gender pay gap (at different parts of the distribution and overall) into a component that can be "explained" by differences in the labour market attributes of women and men – and here the report singles out in particular the role of education – and a component that is "unexplained" by such characteristics. By labour market attributes, we mean the so-called human capital characteristics (typically age, experience and education); the characteristics that define the jobs held by individuals (for example, occupational category or working time); and the characteristics that describe the workplace where production takes place (industrial sector, geographical location, and so on).

Although there are large variations across countries, the report finds that, on average, education and other labour market attributes explain relatively little of the gender pay gap at different points of the wage distribution. The unexplained part of the gender pay gap generally dominates almost all countries, irrespective of income group.

In high-income countries, education contributes on average less than 1 percentage point of the gender pay gap, through it contributes much more in some individual countries. This general finding is not surprising, since in high-income countries the educational attainment of women in paid employment is in many instances higher than that of men; lower educational attainments thus cannot be an explanation for the gender pay gap. More surprisingly, perhaps, lower education is not so prominent a factor explaining the gender pay gap in a majority of low- and middle-income countries either, even though women generally have lower educational attainments than men in many of these countries. In practice, however, a large share of women with low levels of education stay out of the labour market or work as own-account workers rather than paid employees. In fact, women in paid employment tend to be more highly educated than men within similar occupational groups.

Understanding what lies behind the "unexplained" part of the gender pay gap: The undervaluation of women's work and the motherhood pay gap

What lies behind the unexplained part of the gender pay gap? One part of the answer relates to lower wages paid to women for work of equal value. Providing some perspective on this question, though not a full answer, the report looks at occupational categories and shows that in many countries women are more highly educated than men within the same occupational categories but nonetheless earn lower wages. This illustrates the fact that women tend to have lower wage returns for their education than men, even when they work in the same occupational category.

Another part of the answer relates to the undervaluation of women's work in highly feminized occupations and enterprises. The report shows for a selection of countries that wages of women and men with similar levels of education tend to be lower in highly feminized occupations than in other occupations. Further analysis – using data from the European Structure of Earnings Survey (SES) – also shows that wages tend to be lower in enterprises that are highly feminized than in enterprises that are otherwise similar in terms of number of employees, economic sector, ownership and type of collective pay agreement.

Finally, the report also looks at the "motherhood pay gap", defined as the pay gap between mothers and non-mothers. The report estimates that the motherhood pay gap ranges from 1 per cent or less in Canada, Mongolia or South Africa to as much as 30 per cent in Turkey. Lower wages for mothers may be related to a host of factors, including labour market interruptions or reduction in working time; employment in more family-friendly jobs, which are lower paying; or stereotypical hiring and promotion decisions at enterprise level which penalize the careers of mothers.

Part III. Which way forward?

What can be done to progressively reduce gender pay gaps across the world? While there is a range of policies and measures that can be taken to reduce these gaps, the answer to this question will necessarily be country-specific since the factors that drive and explain gender pay gaps vary from country to country and in different parts of the distribution.

Better data

To start with, the report emphasizes the importance of good data and highlights the need in many countries for better data on the distribution of wages. In particular, low- and middle-income countries have very limited statistics on the average wages of women and men. One feasible option would be to review and modify existing surveys by introducing, for instance, modules specifically relating to gender pay gaps into cross-sectional surveys. In better-resourced countries, panel data can go some way towards solving certain of the issues related to the interpretation of life-cycle events.

The need to move beyond simple measures of the gender pay gap

The report also recommends going beyond summary measures to inspect in more detail the respective wage structures of women and men, analyse gender pay gaps in more homogeneous subgroups of wage earners, and calculate factor-weighted gender pay gaps which control for some of the major composition effects. This is especially useful where women's labour force participation is low and where women cluster in particular sectors and occupations.

Finding out where in the wage distribution the gender pay gap is largest, and reviewing the effectiveness of existing labour market institutions

An important question is whether the gender pay gap in a particular country is mostly driven by pay gaps at the bottom, in the middle or at the top of the wage distribution. This has important policy implications. For example, whereas a well-designed minimum wage with broad legal coverage could reduce the gender pay gap at lower wage levels, collective agreements that are extended to vulnerable groups of workers and include provisions on gender pay gaps or pay transparency could have the same effect higher up in the wage distribution. Finally, policies and measures that promote greater representation of women in senior and highly paid positions could have a positive effect at the top levels. Measures that promote the formalization of the informal economy can also greatly benefit women, bringing them under the umbrella of legal and effective protection and empowering them to better defend their interests.

Tackling the "explained" part of the gender pay gap, including through education, changing stereotypes, and combating employer prejudice in hiring and promotion decisions

The decomposition analysis in the report shows that part of the gender pay gap can be explained by differences in the labour market attributes of women and men, including their levels of education, and the fact that they tend to work in occupations or industries that pay less. The importance of these factors varies from country to country. Where women in paid employment have lower educational achievements than men, educational policies targeting enrolment rates among girls may contribute to reducing the gender pay gap in the future. Reducing polarization and occupational segregation may require changing perceptions and stereotypes, for example to attract more women into the areas of science, technology, engineering and mathematics (STEM), which offer better-paid employment opportunities, or to combat employer prejudice in hiring and/or promotion decisions.

Tackling the "unexplained" portion of the gender pay gap

The report finds that in many countries the largest part of the gender pay gap is unexplained by differences in attributes and characteristics of women and men. A growing number of countries are thus focusing attention on national legislation

which prohibits pay discrimination against women and measures that promote equal pay between women and men. However, there is a long way to go. While 40 per cent of all countries have adopted the full principle of "equal pay for work of equal value", the remaining countries focus instead on the narrower principle of "equal pay for equal work". In addition, some countries have taken steps to promote pay transparency to expose differentials between women and men, requiring (usually large) enterprises to disclose the earnings of their employees. In recent years, a number of countries have embraced proactive pay equity laws, which require employers to regularly examine their compensation practices, assess the gender pay gaps and take action to eliminate the portion of the gap due to discrimination in pay.

Countries should also look into possible ways to address the undervaluing of women's work in highly feminized occupations and industries, including by raising wages in the latter. Eliminating this bias is not only a way to narrow the gender pay gap directly, it is also a condition to reducing occupational segregation, for example by attracting more men into the education and health sectors.

What can be done to reduce the motherhood pay gap? More equitable sharing of family duties between women and men, as well as adequate childcare and elder-care services, would in many instances lead to women making different occupational choices. Adequate company policies on flexible working-time arrangements would also help. The lack of programmes supporting women's return to work after childbirth also contributes to the wage penalty that women face when resuming work after a prolonged period of absence from the labour market.

Time to accelerate progress in closing the gender pay gap

Never before has awareness of and commitment to gender equality at work, as well as in society, been so prominent in national and international public debates. The United Nations SDG 8 sets the target of "achiev[ing] full and productive employment and decent work for all women and men, including for young people and persons with disabilities and equal pay for work of equal value" by 2030. To support this Goal, the Equal Pay International Coalition (EPIC), which was launched in September 2017 as a multi-stakeholder initiative that includes the ILO, UN Women and the OECD, seeks to achieve equal pay for women and men. There is an international momentum in favour of concrete and coordinated action to tackle gender inequality.

In practice, however, progress in reducing gender pay gaps has been too slow. More vigorous and decisive action is needed. In addition to the specific measures discussed above, we set out a few more general considerations. First, accelerating progress will require both political commitment and social transformation. While public policies to enhance education, labour and social protection, and to improve social infrastructure, are necessary to close the gender pay gap, their effectiveness depends at least in part on shifting social norms and gender stereotypes. Second, comprehensive, cross-cutting approaches to gender equality are necessary to combat the gender pay gap. Indeed, not only are gender pay gaps rooted in well-entrenched stereotypes, they also represent a summary indicator

that captures many disadvantages faced by girls and women both within and outside the labour market. Hence measures to reduce or eliminate gender pay gaps should be embedded in a broader overall gender equality policy. Third, we emphasize once again that the appropriate mix of policies in any national context will depend on that particular country's circumstances, and that robust analytical work is needed to identify the largest contributory factors – and hence the most effective remedies – in different country contexts.

PART I Major trends in wages

1 Introduction

This year's *Global Wage Report* appears in a context of slow growth in average wages in developed economies. In some countries this growth has taken place in circumstances of relatively slow economic growth, whereas in other countries it has occurred in spite of accelerating economic recovery and declining unemployment rates. There are multiple possible explanations for subdued wage growth in these latter countries, ranging from slow productivity growth to the intensification of global competition, the decline in the bargaining power of workers, the inability of unemployment statistics to adequately capture slack in the labour market, and an uncertain economic outlook which may have discouraged firms from raising wages.[1]

In low- and middle-income economies, growth in average wages has generally been more robust, but with much diversity across countries and regions. While wages have increased rapidly over the past decade in some countries, most particularly in China, in many other countries average wages remain low and insufficient to adequately cover the needs of workers and their families. Overall, in low- and middle-income economies, an estimated 50 per cent of all wage earners continue to work in the informal economy, either in the informal sector or as informal workers in the formal sector (ILO, 2018a).

Part I of this year's *Global Wage Report* provides evidence of these wage trends, setting out the most recent movements in global and regional wages and discussing the economic context in which they have taken place, with a particular focus on trends in economic growth and price inflation. Ahead of this year's report a special effort has been made to increase the representation of African countries in the analysis of wage trends: this is reflected in the substantially higher number of African countries for which this report is able to include wage data. The report discusses some country-level trends and also looks at the extent to which recent wage trends in developed economies can be explained – or not – by changes in labour productivity.

1. On the slow wage growth in advanced economies see also OECD, 2018; IMF, 2017.

2 Global wage trends

2.1 Wage trends

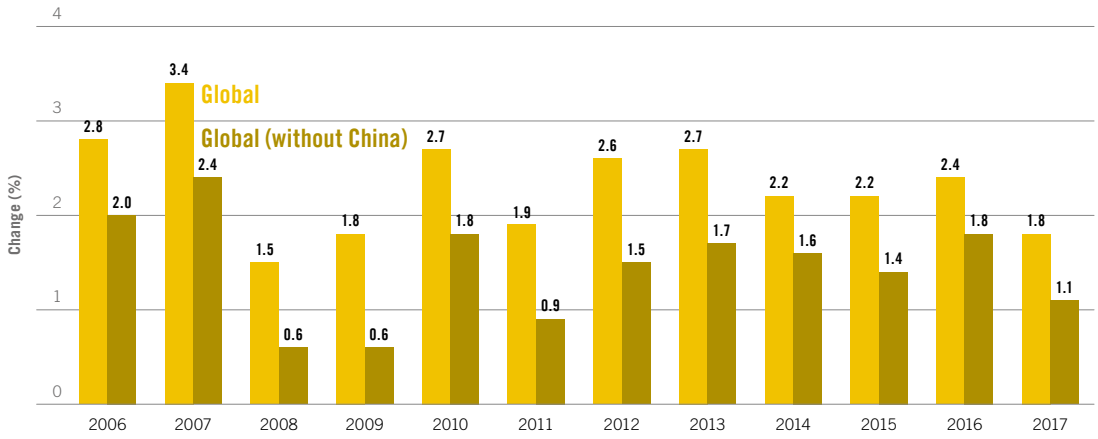
According to ILO estimates, the average world labour force participation rate stands at about 62 per cent of the working-age population, with approximately 3.3 billion individuals engaged in employment. Among all who are employed, some 54 per cent, that is, 1.8 billion, are wage and salaried workers, which represents an increase of some 760 million wage and salaried workers compared to 25 years ago (ILOSTAT; ILO, 2017). For most of these workers, income from wages makes up a significant proportion of their total household income. On average, the share of wages in the total incomes of households including at least one member of working age ranges from about 40 per cent in some low- and middle-income countries to between 60 and 80 per cent in high-income economies (ILO, 2016a). Hence, analysing global and regional wage growth is key to understanding the growth of incomes and living standards worldwide.

How have real average wages changed in recent years? Figure 1 shows estimated global real wage growth with and without China between 2006 and 2017, based on data from 136 economies. Real wage growth is calculated using gross monthly wages, rather than hourly wage rates, which are less frequently available, and fluctuations therefore reflect both hourly wages and the average number of hours worked. Real wages are net of consumer price inflation: that is, nominal wages are deflated by a relevant price index, usually the consumer price index (CPI). The global and regional estimates are based on a weighted average that takes into account the total number of wage employees in the respective countries, wage levels and wage growth. The full methodology and definitions of wages are provided in Appendix I, with country-specific data provided in Appendix II. The exclusion of China, whose large population and rapid wage growth significantly influence the global average, provides an estimate that better captures what happens in other countries worldwide.

It is apparent from figure 1 that global real wage growth in 2017 was not only lower than in 2016, but fell to its lowest growth rate since 2008, remaining far below the levels obtaining in 2006 or 2007, before the global financial crisis. The slowdown in wage growth between 2016 and 2017 is observable in both series, with and without China. The same slowdown can also be observed in the estimate, shown in figure 2, of real wage growth in the G20 countries, which account for some 60 per cent of the world's wage employees and together produce about three-quarters of global GDP. While G20 wage growth is somewhat higher than global wage growth, nevertheless both estimates declined substantially between 2016 and 2017. Figure 2 also gives separate wage growth estimates for advanced and emerging G20 economies,[2] showing that over the whole period, real wages increased more rapidly

2. The division of G20 countries into "advanced G20" and "emerging G20" is based on IMF groupings, in which "advanced G20" excludes European Union aggregate.

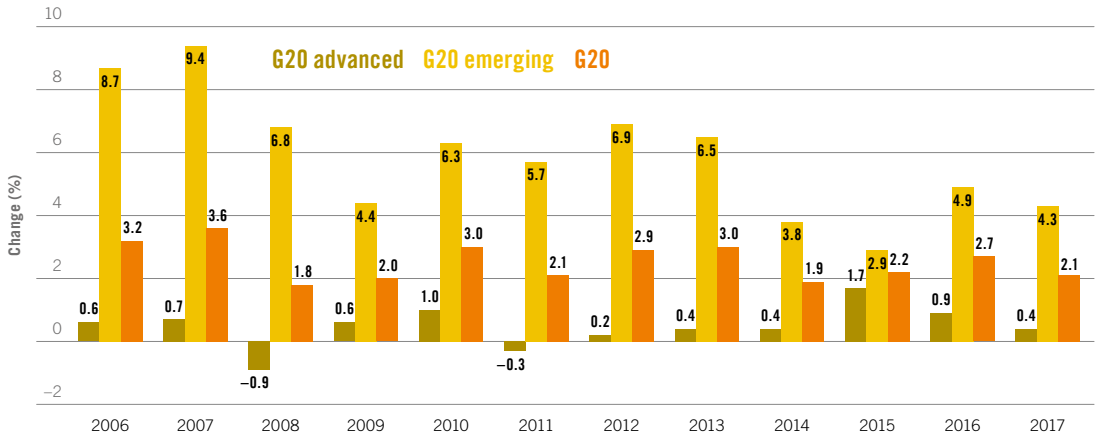
Figure 1 Annual average global real wage growth, 2006–17



Note: 2017 figures are preliminary estimates as national estimates are not yet available for all countries.

Source: ILO estimates based on official national sources as recorded in ILOSTAT and the ILO Global Wage database. The full data set is available from the ILO Global Wage database and can be downloaded free of charge (see: www.ilo.org/ilostat).

Figure 2 Annual average real wage growth in the G20 countries, 2006–17



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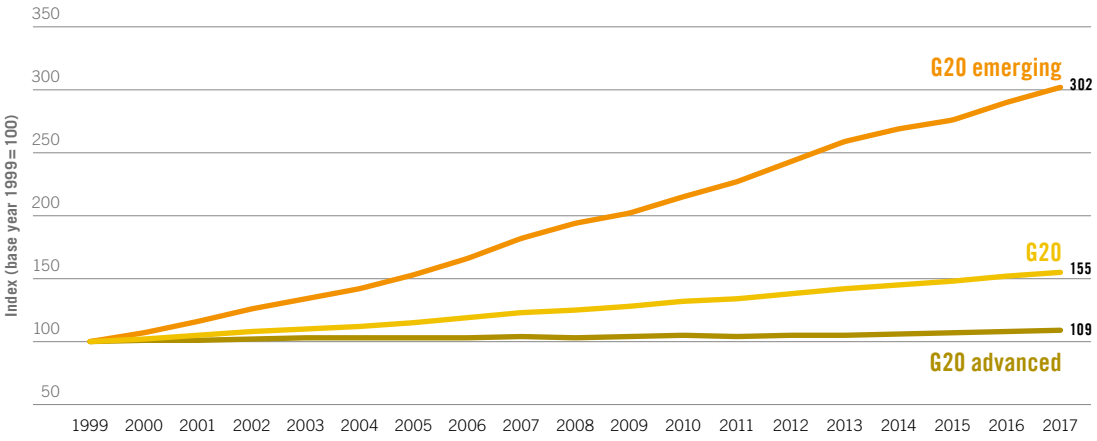
Source: ILO estimates based on official national sources as recorded in ILOSTAT and the ILO Global Wage database. The full data set is available from the ILO Global Wage Database and can be downloaded free of charge (see: www.ilo.org/ilostat).

in emerging G20 countries than in advanced G20 countries. Again, however, wage growth in 2017 was slower than in 2016 in both developed and emerging economies.

Figure 3 shows that, according to our estimates, average wages in the G20 grew by a total of about 55 per cent between 1999 and 2017. This figure, however, hides large differences between emerging G20 economies, where average wages tripled, and advanced G20 economies, where real average wages increased by a total of only 9 per cent. In spite of the more rapid wage growth, the level of average wages in emerging economies remains substantially lower than in advanced G20 economies. Converting all G20 countries' average wages into US dollars using

Figure 3 Total increase in the real average wages of G20 countries, 1999–2017



Note: 2017 figures are preliminary estimates as national estimates are not yet available for all countries.

Source: ILO estimates based on official national sources as recorded in ILOSTAT and the ILO Global Wage Database (see: www.ilo.org/ilostat).

purchasing power parity (PPP) exchange rates yields a simple average wage of some US$3,250 per month in advanced economies and about US$1,550 per month in emerging economies.[3]

2.2 The global context

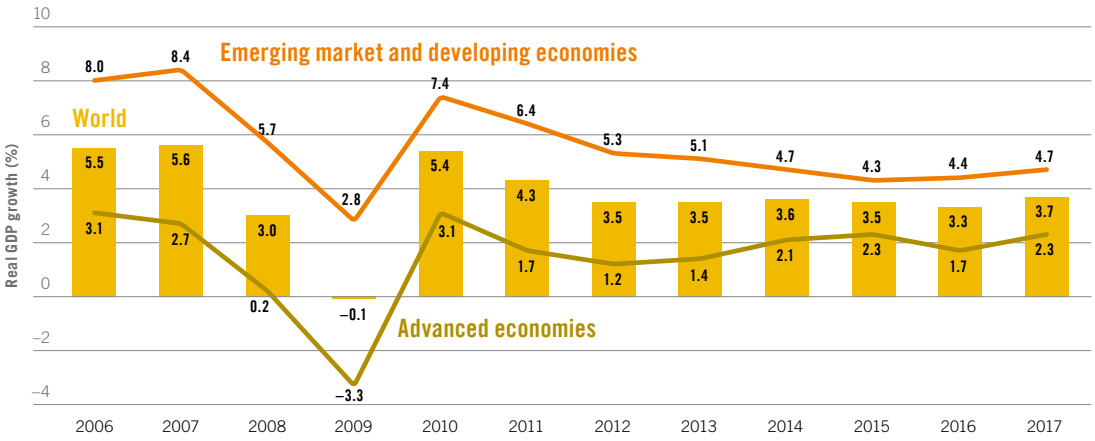
The slowdown in wage growth in 2017 occurred in spite of more rapid economic growth. Figure 4 shows that global economic growth picked up in 2017 and is expected to further increase in 2018.[4] As can be seen, economic growth accelerated in advanced economies as well as in emerging market and developing economies. In the advanced economies, this acceleration was led mainly by higher investment spending, which had previously remained weak since the 2008–09 global financial crisis, and was helped by stronger export growth. On the other hand, private consumption among advanced economies did not contribute significantly to real GDP growth in the period 2016–17, which is perhaps not too surprising in the light of the low wage growth documented in figures 1 and 2. In emerging markets and developing economies, faster growth was driven by both a surge in fixed investment and an acceleration in private consumption.

Figure 5 shows the evolution of price inflation. While in 2015 and 2016 advanced countries faced the possibility of entering into a downward price spiral or deflationary period, more recently inflation rates rose from less than 1 per cent

3. The PPP conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as US$1 would buy in the United States. This conversion factor is for private consumption (i.e. household final consumption expenditure). For most economies, PPP figures are extrapolated from the 2011 International Comparison Program (ICP) benchmark estimates or imputed using a statistical model based on the 2011 ICP. For 47 high- and upper-middle income countries, conversion factors are provided by Eurostat and the OECD.

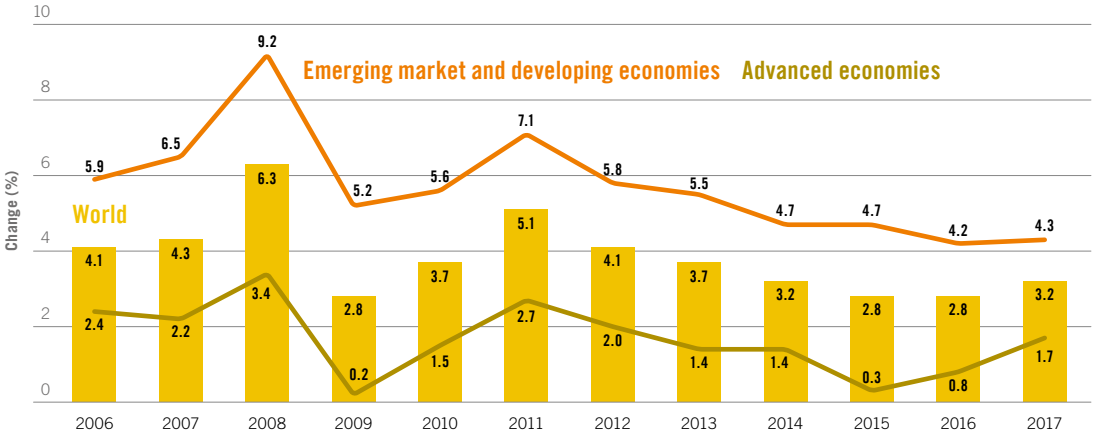
4. This paragraph is based on IMF, 2017 and 2018.

Figure 4 Annual average economic growth, 2006–17 (GDP in constant prices)



Note: Country groups are those used by the IMF as described in the appendix to the IMF's *World Economic Outlook*, Oct. 2018.
Source: IMF World Economic Outlook database, Oct. 2018.

Figure 5 Inflation, 2006–17 (average consumer prices)



Note: Country groups are those used by the IMF as described in the appendix to the IMF's *World Economic Outlook*, Oct. 2018.
Source: IMF World Economic Outlook database, Oct. 2018.

in 2015 and 2016, a mark well below that targeted by central banks, to 1.7 per cent in 2017.[5] This higher inflation in 2017, combined with relatively stable nominal wage growth, eroded real wage growth. At the same time, core inflation (that is, inflation excluding food and energy prices) often remained well below the 2 per cent mark, raising the question of how higher nominal wage growth could help to achieve inflation targets. In emerging markets and developing countries, average price inflation experienced a continuous decline over the period 2011–17, although in these countries deflation is not a concern.

5. The European Central Bank (ECB) aims at inflation rates of below, but close to, 2 per cent over the medium term. See: https://www.ecb.europa.eu/mopo/html/index.en.html.

In high-income economies, the slow increase in real average wages in a context of stronger economic growth is all the more surprising as unemployment rates have generally declined. The average seasonally adjusted unemployment rate among the EU28 countries stood at around 6.5 per cent in April 2018, the lowest rate recorded in the European Union (EU) since December 2008.[6] In the United States, unemployment is close to its lowest level since the late 1960s, falling to 3.8 per cent in May 2018.[7] It is generally considered that there exists an inverse relationship between unemployment rates and wage growth, so that when unemployment rates go down wage growth accelerates and, conversely, when unemployment rates increase, wage growth slows down. In 2016 and 2017, this relationship did not appear very strong.

Although unemployment rates also declined in low- and middle-income economies (ILO, 2018a), the extent to which this indicator provides a robust perspective on the state of the labour market is limited by the fact that many workers simply cannot afford to remain unemployed and hence must remain active, often in the informal economy. A recent ILO report suggests that almost 40 per cent of all wage earners and more than 60 per cent of the world's total employed population earn their livelihood in the informal economy, with the share of informal employment exceeding 90 per cent in a significant fraction of sub-Saharan economies (ILO, 2018c).

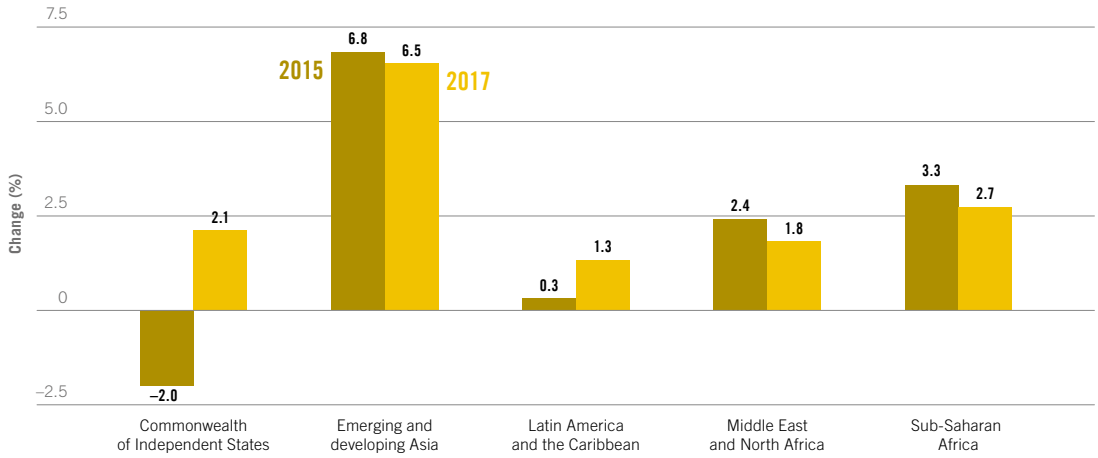
6. Data from Eurostat, Apr. 2018.

7. Data from US Bureau of Labor Statistics.

3 Regional wage trends

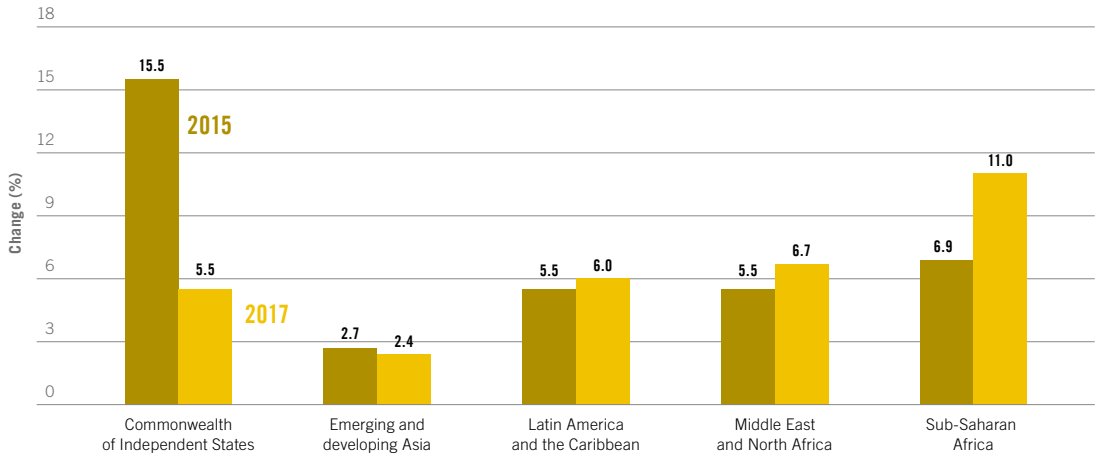
Trends in economic indicators and real wages vary considerably by region. Figures 6 and 7 show, respectively, economic growth rates and inflation figures for 2015 and 2017 by region. From figure 6 it is clear that economic growth remains higher in emerging and developing Asia than in other regions of the world. Inflation also varies considerably between regions. In 2017, it was highest in sub-Saharan Africa and the Middle East and North Africa. In sub-Saharan Africa, this increase is a result of earlier exchange rate depreciation (IMF, 2018). On the other hand, a

Figure 6 Annual average economic growth by region, 2015 and 2017 (GDP in constant prices)



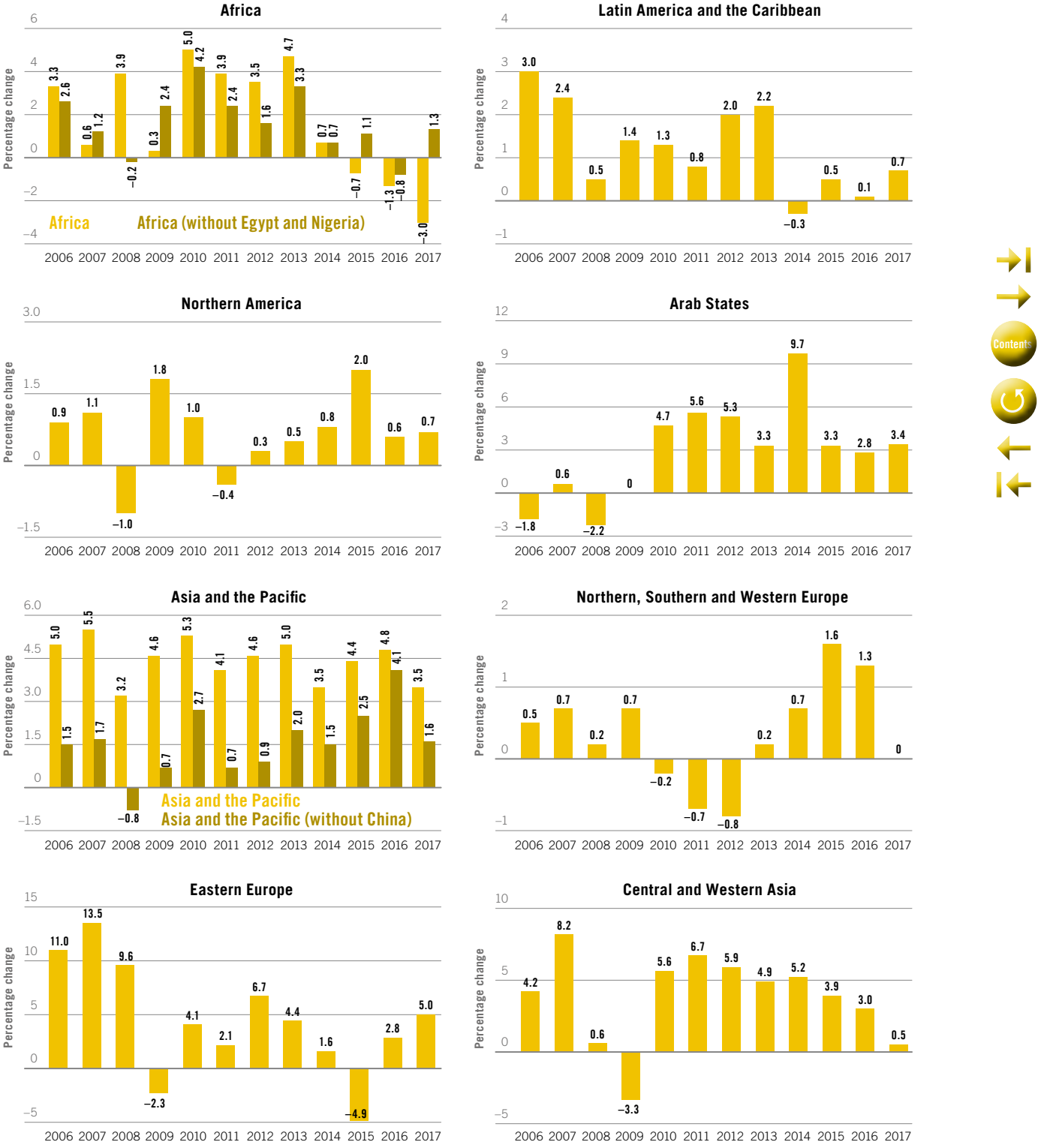
Note: Country groups are those used by the IMF as described in the appendix to the IMF's *World Economic Outlook*, Oct. 2018.
Source: IMF World Economic Outlook database, Oct. 2018.

Figure 7 Inflation by region, 2015 and 2017 (average consumer prices)



Note: Country groups are those used by the IMF as described in the appendix to the IMF's *World Economic Outlook*, Oct. 2018.
Source: IMF World Economic Outlook database, Oct. 2018.

Figure 8 Annual average real wage growth by region, 2006–17 (percentage change)



Note: Country-specific and regional wage data can be found in Appendix II.

Source: ILO estimates based on official figures.

strong US dollar and currency appreciation in many Latin American economies have helped to keep inflation at relatively moderate levels, with countries such as Brazil experiencing historically low inflation rates.

Figure 8 shows that, reflecting more rapid economic growth than in other regions, workers in Asia and the Pacific have enjoyed the highest real wage growth among all regions over the period 2006–17, with countries such as China, India, Thailand and Viet Nam leading the way. However, even here wage growth in 2017 was lower than in 2016, falling by a considerable margin of 1.3 percentage points.

In Latin America and the Caribbean, real wage growth in 2017 increased slightly compared to 2016 but remains relatively low, below the 1 per cent mark. In Mexico, real wage growth is still well below its 2008 level and has continued to decline in the years leading up to 2017, while Brazil has bounced back from decline in 2015–16.

In Africa, real wages appear to have declined overall in 2017. This is mainly attributable to very high inflation rates owing to a currency devaluation in Egypt, a large country which exerts a strong influence on our weighted regional average, as well as by reported falling real wages in Nigeria. If these two countries are taken out of the sample, real wages in Africa are estimated to have increased moderately in 2017.

In Central and Western Asia, wage growth has continued the gradual decline that started in 2011, since when it dropped by more than 6 percentage points to less than 1 per cent in 2017. Among these economies we find Turkey, where real wage growth fell gradually between 2015 and 2017 in spite of an acceleration in economic growth.

In Eastern Europe, stronger demand in neighbouring economies, together with a tighter labour market (unemployment rates in the Czech Republic, Poland and Romania are all below the European average), contributed to the observed increase in real wage growth to positive figures in 2016 and 2017.

In Northern, Southern and Western Europe, wage growth exceeded 1 per cent in 2015 and 2016, but fell to about zero in 2017 owing to lower wage growth in large countries such as France and Germany, and declining real wages in Italy and Spain.

In Northern America (Canada and the United States), wage growth declined from an average of 2 per cent in 2015 to less than 1 per cent in 2016 and 2017.

The estimates shown in figure 8 for the Arab States are only tentative, owing to severe data constraints in the region.

Box 1 Wage statistics in Africa

The *Global Wage Report 2016/17* included data on average wages for only 14 out of a total of 54 African countries. For this year's *Global Wage Report*, a major effort has therefore been made to collect more and better data on wages and wage growth from economies in Africa. Two regional workshops on wage statistics were held on the continent. The first was held in Cairo, Egypt, in December 2017 and focused on a selection of East African countries, namely Ethiopia, Madagascar, Malawi and Uganda, as well as Egypt. The second workshop took place in Abidjan, Côte d'Ivoire, in April 2018 and gathered data from a number of West African countries, namely Benin, Cameroon, Côte d'Ivoire, Gabon, Ghana, Nigeria and Senegal.

The workshops helped to increase Africa's representation in this year's *Global Wage Report*. Data on nominal wages were collected from 28 countries and data on real wages from 24 countries. As a result of these efforts, 84 per cent of employees in Africa are covered in this edition of the *Global Wage Report*, representing approximately 91 per cent of the continent's total wage bill – though it must be pointed out that these countries do not all produce data on wages every year.

Data on wages in sub-Saharan Africa are usually collected through administrative records such as social security forms and treasury single accounts, as well as regular censuses and household surveys (labour force surveys, living standard measurement studies, etc.) as there is no stand-alone survey on wages in most countries. Extracting wage-related data from these types of sources can be challenging. Administrative records pose some difficulties as they are generally structured for administrative purposes rather than statistical ones and are therefore not always disaggregated by sex; similarly, the coverage of the target population is usually defined by legal and/or administrative procedures. Another common observation in this regard is the difficulty in distinguishing between different labour-related concepts, notably income concepts. Indeed, some data sets provide only data on total disposable income, with no additional information on the nature of the income received.

Finally, it must be pointed out that wage employees in Africa represent only a limited proportion of these countries' working populations. In Benin, for example, only 11.5 per cent of employed males and just 3.7 per cent of employed females were paid employees in 2010. In Uganda, according to the 2016/17 National Household Survey, wage employees represented around 23 per cent of the total employed population. Ethiopia's labour force survey shows paid employees representing only 10 per cent of the working population in 2013, while "unpaid family workers" and "self-employed" account for the highest shares of the country's registered labour force. In Cameroon, the proportion of wage employees in the working population rose to around 20 per cent of the working population in 2010 from 12 per cent in 2005, while in Madagascar, the share of wage employees declined from 11 per cent in 2012 to 9.5 per cent in 2015.

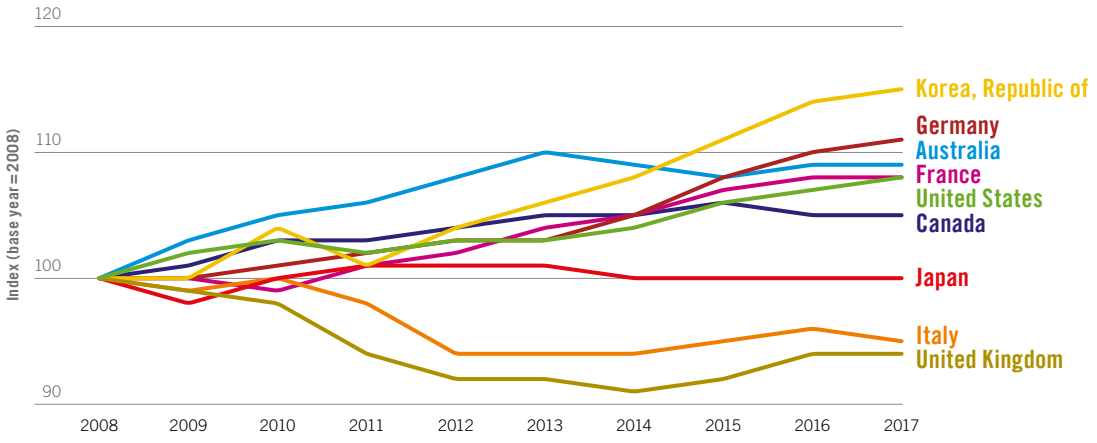
4 Wage indices over the last ten years

Taking a longer-term perspective, figures 9 and 10 show the indices of real wages over the period 2008–17 in selected advanced and emerging G20 countries, respectively.

Among advanced economies, there are two distinct groups: those that have experienced positive growth rates and those where real wage growth has declined or remained close to zero (see figure 9). The former group is led by the Republic of Korea, where wage growth has increased most rapidly and by a total of 15 per cent in the period 2008–17. It is followed in second place by Germany, which started the period with near zero growth in wages in 2008 and 2009 and only moderate wage growth in the period 2010–13; thereafter wage growth in Germany accelerated, leading to an 11 per cent increase in real wages over the whole period 2008–17. Australia, the United States, France and Canada are the other advanced G20 countries that have experienced positive wage growth in the period leading up to 2017, although with more modest aggregate outcomes – ranging from 5 to 9 per cent over the period – when compared to the Republic of Korea and Germany.

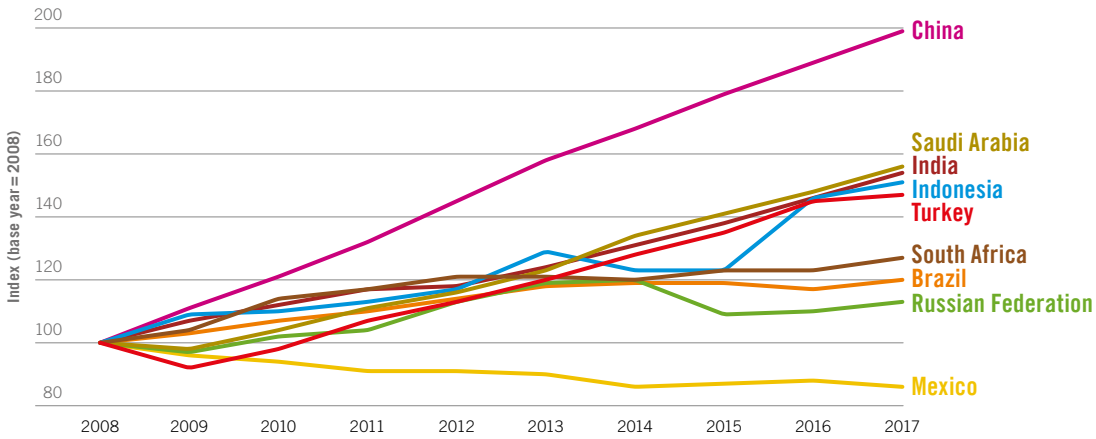
Italy and the United Kingdom have suffered losses in real wage growth of about 5 per cent over the period 2008–17. In the case of Italy, a return to positive wage growth from 2014 was halted in 2017, when real wages declined again, whereas in the United Kingdom, after a two-year recovery period between 2014 and 2016, wage growth seems to have remained constant since 2016. In Japan, overall wage growth over the period 2008–17 has been close to zero.

Figure 9 Average real wage index for advanced G20 countries, 2008–17



Source: ILO estimates.

Figure 10 Average real wage index for emerging G20 countries, 2008–17



Source: ILO estimates.

Figure 10, which complements figure 9 by looking at emerging G20 economies, shows the marked and continuing rising trajectory of China, where average real wages almost doubled between 2008 and 2017. In fact, all emerging G20 countries except Mexico experienced significant positive growth in average real wages over this period. Wage growth continues in Saudi Arabia, India and Indonesia, whereas in Turkey it declined to around 1 per cent in 2017. South Africa and Brazil have experienced positive wage growth starting from 2016 after a phase of mostly zero growth during the period 2012–16, with negative growth in Brazil during 2015–16. The Russian Federation suffered a significant drop in wage growth in 2015, again owing to the decline in oil prices, but has since then bounced back with moderate though positive wage growth.

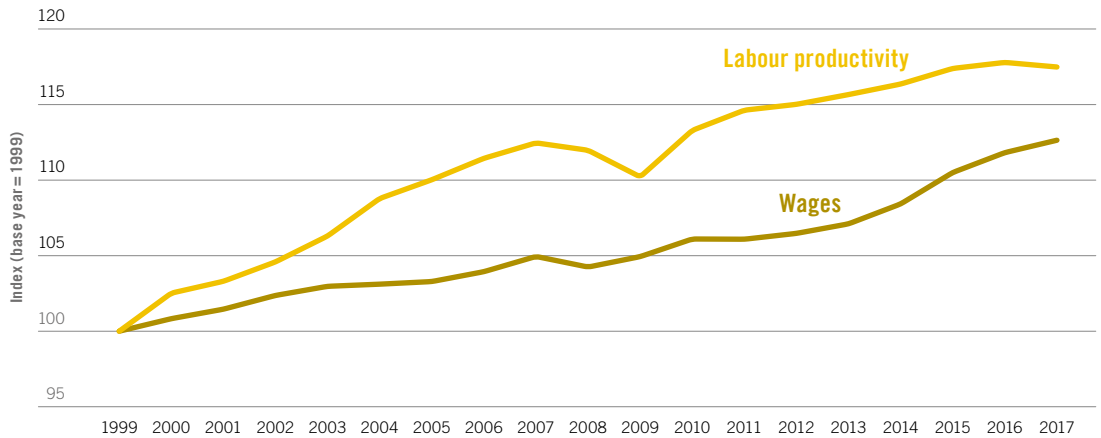
5 Wages and productivity in high-income economies

Given the recovery in GDP growth in 2017 and the gradual reduction in unemployment rates, slow wage growth in high-income economies represents somewhat of a puzzle and has been the subject of intense debate. Several potential contributory factors have been considered and debated, including slow productivity growth.[8]

Figure 11 shows trends in average real wages and labour productivity in 52 high-income countries between 1999 and 2017.[9] Labour productivity is measured as GDP per worker; both the real wage index and the real productivity index are calculated as weighted averages (so that large countries influence the figure more than smaller countries) and are shown in relation to the base year of 1999. Overall, we see that labour productivity has increased more rapidly than real wages. In the period 2014–15, the gap between the two trends narrowed owing to a slight increase in wages in excess of relatively weaker growth in labour productivity. Since then, labour productivity growth has declined slightly while there has been a small increase in wages. These very modest changes in the two trends, but in opposite directions, narrowed the gap between the two lines by about 2 per cent between 2015 and 2017. Overall, the decoupling between wages and labour productivity explains why labour income shares (the share of labour compensation in GDP) in many countries remain substantially below those of the early 1990s.

While the slowdown in labour productivity may partly explain the slow wage growth in high-income economies, it is unlikely to provide a full explanation. Other

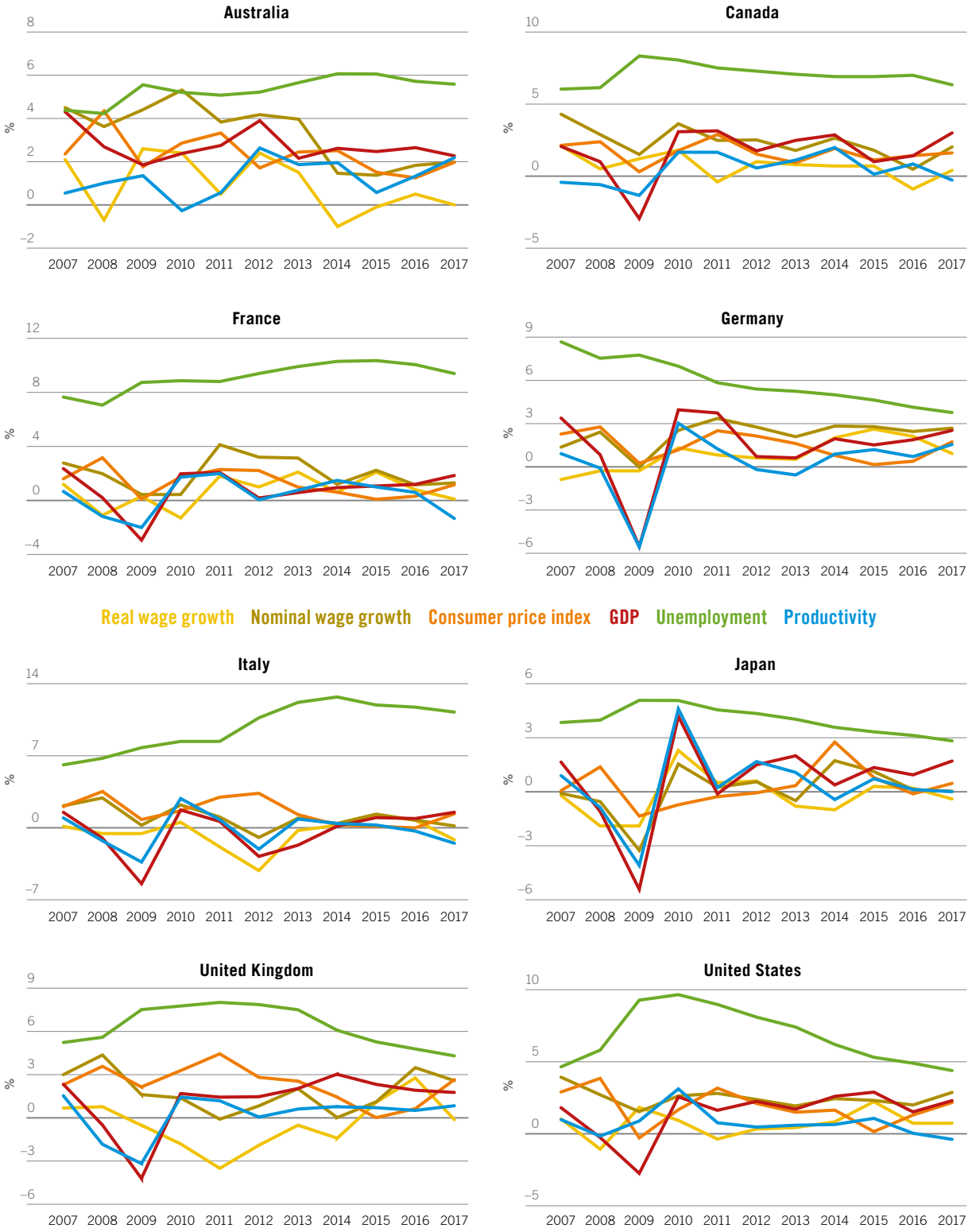
Figure 11 Trends in average real wages and labour productivity in high-income countries, 1999–2017



Source: ILO estimates.

8. See IMF, 2017, Chapter 2, "Recent wage dynamics in advanced economies: Drivers and implications".
9. See Appendix III, table A3, "Country and territory groupings by income level".

Figure 12 Key indicators: Year-on-year change in selected high-income countries, 2007–17



Source: ILO calculations.

explanations proposed in the literature include the possibility that unemployment figures do not accurately capture slack in the labour market, an uncertain economic outlook that may have inhibited enterprises from increasing wage costs, and the decline in the bargaining power of workers owing to the adoption of new technologies, the intensification of global competition, the increasing number of part-time jobs, increasingly diverse forms of employment, and the decline in union density and collective bargaining coverage. Additional possible explanations include a shift towards more capital-intensive industries, or higher capital intensity within industries.

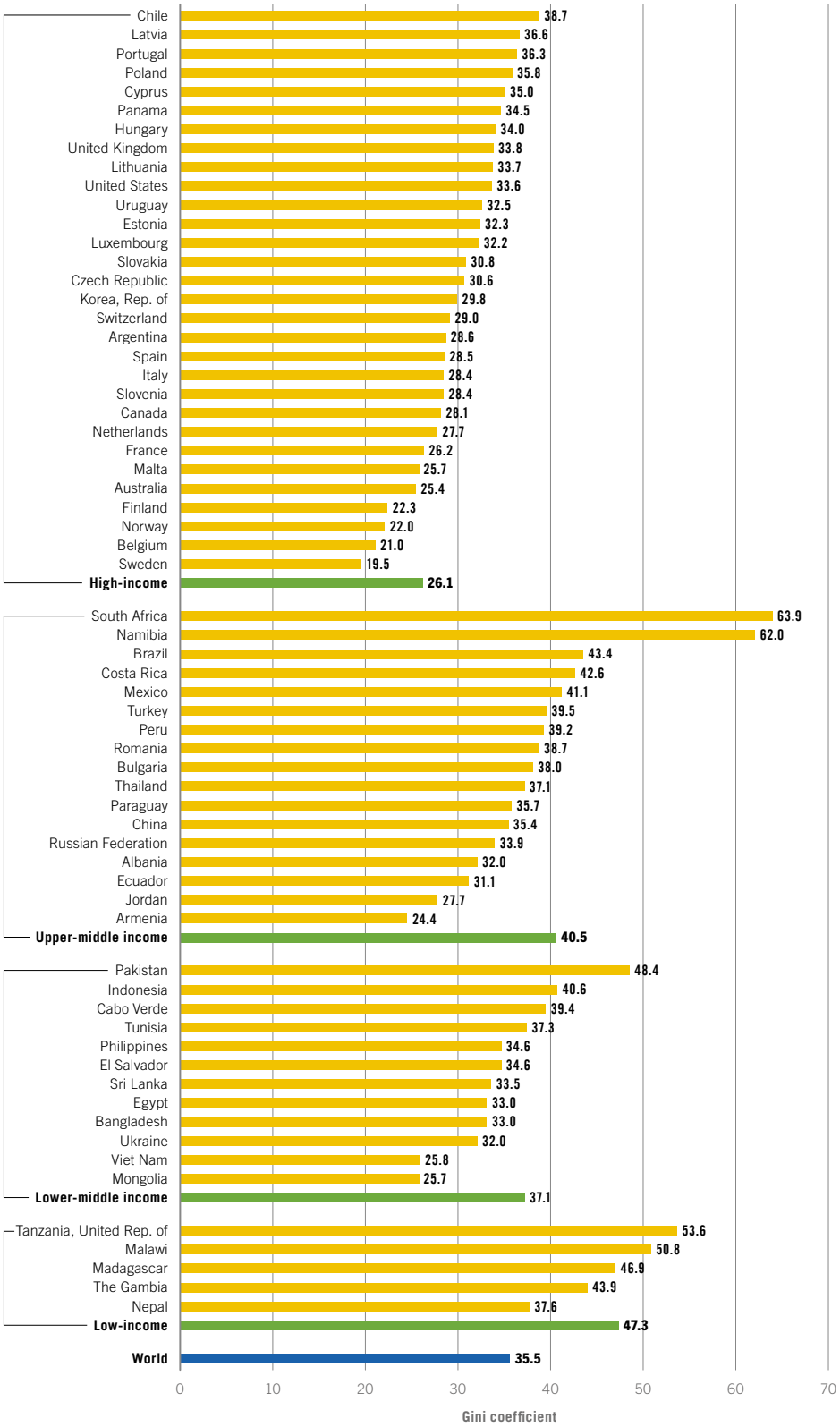
Looking at the individual countries considered in figure 12, we can observe that the pattern of "declining unemployment with flat wages" is particularly pronounced in Germany and the United States – two countries where unemployment rates have been gradually reduced over the last seven to eight years but where the growth rate of nominal wages has remained relatively constant, fluctuating between 2 and 3 per cent per year. Year-on-year changes in real wage growth in those two countries seem to have been determined more by fluctuations in the level of consumer prices than by changes in the growth of nominal wages. A weaker version of this "declining unemployment with flat wages" pattern can also be observed in more recent years in France, Japan and the United Kingdom.

6 Wage inequality

Thus far the report has described the evolution of average wages and how it may relate to changing labour productivity. However, as has been noted in earlier editions of the *Global Wage Report* (ILO, 2014 and 2016a), current average wages, or trends in average wages, do not inform us about levels of wage inequality. Figure 13 shows inequality in wages, as represented by the Gini coefficient, using survey data on wages from 64 countries which, together, reflect the wage distribution from some 75 per cent of the world's wage employees. The figure illustrates wage inequality, comparing countries to others at a similar level of economic development. The Gini coefficient summarizes the relative distribution of wages in the population, with lower values (closer to zero) indicating lower levels of inequality and higher values (closer to 100) indicating higher levels of wage inequality.

Figure 13 shows that wage inequality varies significantly both between and within the four groups of countries. The countries with the lowest levels of wage inequality are found among the high-income group, whereas countries with the highest levels of wage inequality are found in the low-income and middle-income groups. There is also some variation within groupings: among high-income countries, the Gini coefficient ranges from a low of 19.5 for Sweden to a high of 38.7 for Chile. Among low-income countries, the United Republic of Tanzania has a Gini coefficient of 53.6, while South Africa – classified as upper-middle income – scores a Gini coefficient of 63.9. According to these estimates, South Africa, Namibia, the United Republic of Tanzania and Malawi are the countries with the highest levels of wage inequality among the 64 countries considered.

Figure 13 Gini estimates of wage inequality in 64 countries (hourly wages)



PART II Measuring gender pay gaps and understanding what lies behind them

7 Introduction

Part II of this year's *Global Wage Report* provides an analysis of the gender pay gap worldwide, which – expressed in its simplest form – refers to the difference in average wages between all women and all men who are engaged in paid employment.

The gender pay gap is a widely used indicator of gender inequality in the world of work and is frequently used to monitor progress towards gender equality at the national or international level. The United Nations Sustainable Development Goal (SDG) 8 "Decent work and economic growth", target 8.5, sets out the aim to achieve by 2030 "equal pay for work of equal value", of which one of the important measures of progress is "average hourly earnings of female and male employees" (indicator 8.5.1) (UN, 2017). The Equal Pay International Coalition (EPIC), a new multi-stakeholder coalition launched in September 2017, also interprets a reduction of the gender pay gap as an indicator of progress towards the achievement of SDG target 8.5.[1]

However, the analysis of pay gaps must be placed in the broader context of other dimensions of inequality between women and men, including women's more restricted access to paid employment and the unequal division of tasks within the household. In high-income economies, women's participation in paid employment has increased considerably over recent decades, reaching near parity with men in some countries. But this has not been the case everywhere. Globally, women are still substantially less likely than men to participate in the labour market. The global gap in labour force participation has been estimated at 27 percentage points, and participation gaps remain particularly wide in the Arab States, northern Africa and southern Asia, in each case exceeding 50 percentage points (ILO, 2017). Slow progress on this front prompted G20 Leaders at the 2014 Summit in Brisbane to adopt a target of reducing the gender gap in labour force participation by 25 per cent by 2025 (the "25 by 25" target).

When women do participate in the labour market, they tend to have more limited access than men to high-quality employment opportunities. One reason for this is the unequal distribution of hours of unpaid work in the household: women perform most of the household chores and most unpaid care work, both for the household in general and for elderly members and children in particular. As a result, time-use surveys show that, when unpaid as well as paid work is included, women work longer hours than men. This disproportionate burden of unpaid household work has a negative impact on women's labour market participation,

1. Other indicators used by EPIC include a demonstrated commitment to achieving equal pay and the ratification of relevant international labour standards.

particularly in places where access to childcare or family-friendly workplace policies is lacking.

In high-income economies, many women – if they do decide to participate in the labour market – choose to work part time. In middle- or low-income countries, many women seeking paid work are pushed into the informal economy, where they more easily find work that is flexible in terms of schedule and duration, or are constrained to opt for home-based work. Overall, employment status is not evenly distributed between women and men: men are more likely than women to become entrepreneurs; more women than men are classified as unpaid family workers; and often – though not everywhere – more women than men are involved in informal work. Women also tend to work a lower average number of hours than men.

All of these realities have a direct impact on the gender pay gap, a subject on which much has already been said and written in recent years. Two specific observations may be made. First, there is widespread recognition that progress in closing the gender pay gap has been slow, in spite of significant progress in women's educational attainments and higher female labour market participation rates in many countries. Even where women's educational levels have equalled or even surpassed those of men, this has only served to reduce rather than to eliminate the pay gap (O'Reilly et al., 2015). Hence, on aggregate, pay differentials remain a persistent form of inequality between working women and men. Second, it is understood that while a simple measure of the gender pay gap serves to attract the attention of the general public and policy-makers to the problem of unequal pay between women and men, it remains a very imperfect indicator of inequality, needing to be further analysed and refined if it is to adequately inform policy-making (Grimshaw and Rubery, 2015).

A gender pay gap measured simply – the so-called "raw" or unadjusted gender pay gap – can arise for a multitude of different reasons, including, among others: differences between female and male educational attainments; lower wages in the sectors and occupations in which women are concentrated; differences between female and male participation rates in part-time and full-time work, which are in turn influenced by women's role as mothers and their care responsibilities; and discrimination in pay between women and men performing equal work or work of equal value. The most appropriate mix of policy responses will differ across countries, depending on which factors have the largest impact on the gender pay gap in each national context.

So why another report on the gender pay gap? Part II of this report has two specific objectives. The first is to address in detail the challenge of measuring the gender pay gap, and to propose a simple way to adjust the indicator to provide complementary information for the purposes of policy-making and of monitoring progress. The second is to analyse and break down gender pay gaps in a way that can inform policy-makers and social partners about the factors that underlie the gender pay gap. Part III of the report discusses some of the policy implications emerging from the findings of this analysis.

8 Measuring the gender pay gap[2]

The gender pay gap is a widely used indicator, representing the difference in pay overall between women and men wage employees. Despite their apparent simplicity, estimates of the gender pay gap are often controversial, in part because different estimates for the same country in a given time period may vary substantially. Sometimes these discrepancies between estimates arise because of the multiple possible ways of defining the term "pay", or because each estimate is based on a different subpopulation of wage employees. More worrying is the finding that estimates of the gender pay gap using the same definition of pay and applying to the same population can differ considerably depending on the choice one makes on how to measure and summarize the difference in wages between women and men.

When there are sizeable differences in the estimates of the gender pay gap that are presented as empirical evidence, these become a barrier in the policy debate rather than a contribution to it, creating difficulties for policy-makers seeking to identify the necessary and appropriate steps to be taken to reduce the gap. Therefore, clarifying the reasons for discrepancies between alternative measures of the gender pay gap is an essential first step that must precede the more practical examination of the causes of the gap itself. In what follows, we examine the standard methods of estimating the gender pay gap and show the circumstances in which these can result in different and sometimes contradictory estimates. These findings lead in turn to our proposal of a complementary method of estimating gender pay gaps that is useful for the purposes of policy-making and monitoring progress.

8.1 The raw gender pay gap

The raw gender pay gap refers simply to the difference in pay between women and men at a specific point in time, and is usually calculated as the margin by which women's pay falls short of men's. For example, if women's pay is 75 per cent of men's, it is said that the gender pay gap is 25 per cent. In this context, the terms "women's pay" and "men's pay" refer to measures summarizing the full range of earnings received by, respectively, all women and all men who are classified as paid employees.[3] This full range of wages (of women or men) is what we call "the wage distribution" or "the wage structure" of (women or men) wage workers in the population.

The two measures that are almost always used to summarize the information in such a distribution are the *mean* (the average of all the values covered) and the *median* (the value located in the middle of the distribution). Thus, the

2. Estimates presented in this report may differ from those of national official sources owing to differences in the choice of methodology.

3. The term "pay" refers to wages or earnings received by dependent workers (employees), as opposed to income received from other modalities of labour market participation, for example, self-employment. In this sense, throughout this report, the terms "gender pay gap" and "gender wage gap" are used interchangeably, irrespective of whether pay refers to hourly wages, monthly earnings or any other way of describing earnings arising from dependent employment.

"mean gender pay gap" compares the average of the women's pay distribution to the average of the men's pay distribution, while the "median gender pay gap" compares the value located in the middle of the women's pay distribution to the value located in the middle of the men's pay distribution. This may be one source of differences between estimates. Using hourly wages to estimate the gender pay gap, as per SDG indicator 8.5.1, has the advantage of disentangling working time from earnings. Conversely, the use of other measures (monthly, weekly or daily pay) can reflect differences not only in hourly pay but also in the number of hours worked over a period of time. When the data supplied on wages are aggregated and it is not possible to disentangle hours worked from payment per hour, one way to compare gender pay differentials is to consider only the subgroup of full-time workers. Although this method comes close to comparing hourly wages between women and men, the result removes from the calculation all part-time workers, the majority of whom are women and who tend to earn lower hourly wages.

In practice, though monthly wages are more frequently available, most survey data from sources such as labour force surveys provide information that enables the derivation of hourly wages.[4] A first inspection of the gender pay gap using these two alternative measures of pay provides an insightful starting point for a detailed analysis and understanding of pay differentials between women and men.

Figures 14 and 15 show estimates of the gender pay gap for up to 73 countries; these countries are drawn from all regions of the world and cover about 80 per cent of the world's wage employees. Each of these figures presents estimates based on the mean gender pay gap and the median gender pay gap; together they enable us to compare, whenever possible, gender pay gaps based on hourly wages with those based on monthly earnings. Thus the two figures together present four possible configurations. Each of these includes an overall world gender pay gap; these global figures are based on weighted values that take into account the number of wage employees in each of the countries covered – thus, larger countries such as China, Mexico or the United States will weigh more in the global estimate than smaller countries such as Malawi, Nepal or Panama.

The first observation arising from these figures is that the gender pay gap is overwhelmingly estimated as a positive value – that is, a value indicating that men earn more than women. If one considers the mean gender pay gap based on hourly wages, 58 of the 73 countries covered in figure 14 show a positive mean gender pay gap; the same is true for 54 of the 65 countries for which median gender pay gaps are estimated. In the case of monthly earnings (figure 15), the prevalence of positive gender pay gaps becomes even more evident: only three of 65 countries show negative mean gender pay gaps, and only two of 65 countries show negative median gaps. Although the gender pay gap is negative in a number of countries

4. It is common to find that survey data provide information on pay in the form of either hourly wages or monthly earnings; less frequently, some surveys ask respondents to declare earnings in alternative time frameworks, such as weekly amounts (e.g. the US Census of Population Survey) or daily amounts (e.g. the Mexican Employment and Occupation National Survey (ENOE), or many of the surveys conducted in Asia, where surveyed employees are usually asked to declare their daily – rather than hourly or monthly – earnings).

(an issue to which we return later), the figures nonetheless provide strong evidence of an overall pay gap in favour of men.

The weighted global estimates range from about 16 per cent (in the case of mean hourly wages) to 22 per cent (in the case of median monthly wages), depending on which measure is used. Looking at all the different estimates, one conclusion is that, on average, women are paid approximately 20 per cent less than men across the world. However, there are wide variations among countries, with the mean hourly gender pay gap, for example, ranging from 34 per cent in Pakistan to −10.3 per cent in the Philippines (which would be interpreted to mean that in this country, women earn on average 10.3 per cent more than men).

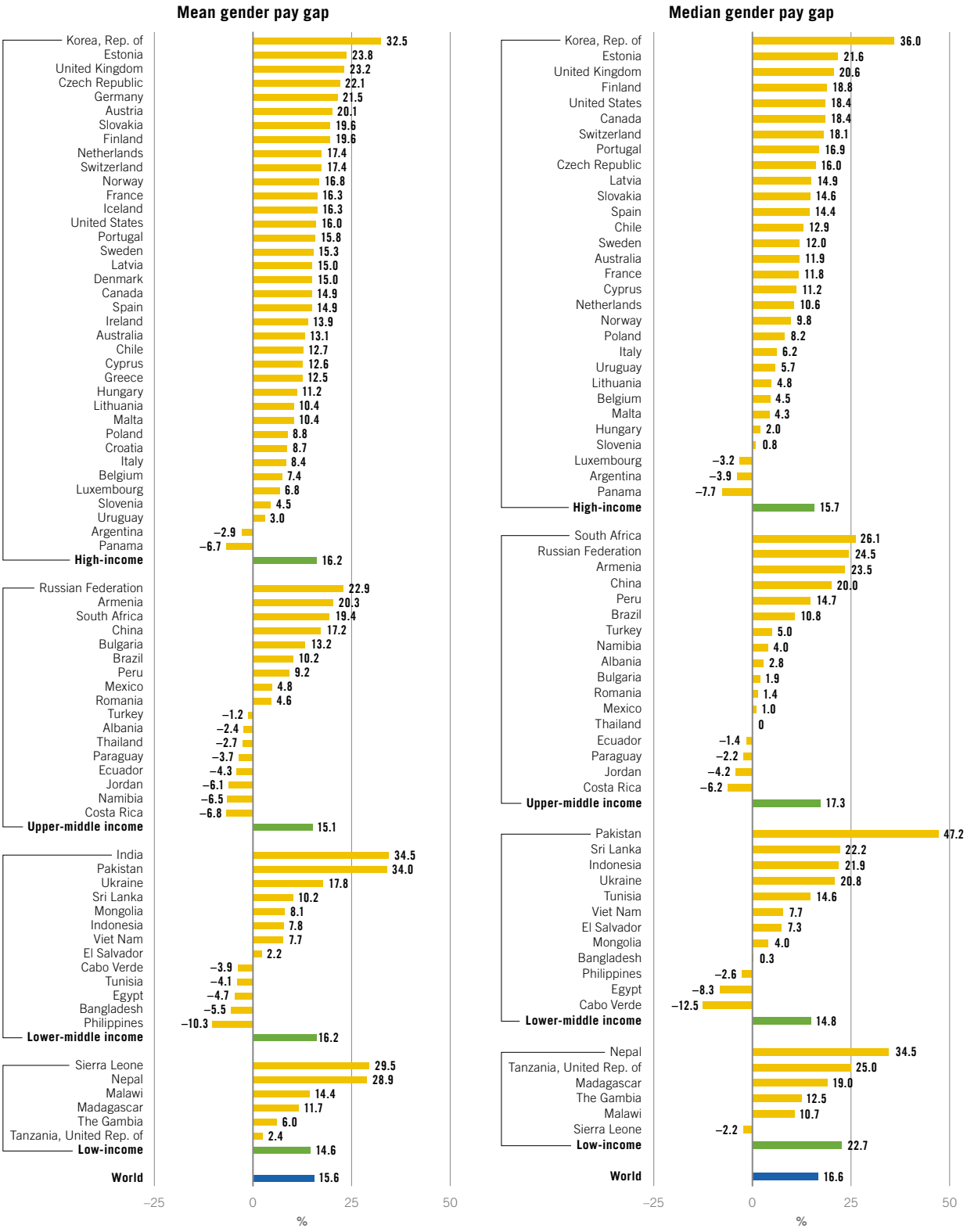
The second observation is that for almost all countries the gender pay gap is higher when the estimate is based on monthly wages rather than hourly wages, reflecting the fact that in most countries women and men differ significantly in respect of working time – specifically, that part-time work is more prevalent among women than among men (see Fagan et al., 2014). In all but five of the 73 countries in our database, the incidence of part-time work is higher among women than among men, although the scale of the difference varies widely: in the Netherlands, for example, 72 per cent of women employees but only 26 per cent of men employees are part-time workers; by contrast, among Bangladeshi employees, only 10 per cent of women and 4 per cent of men work part time. On a weighted average of the 72 countries, the proportion of women in part-time work is 14 per cent, compared to 7 per cent for men.[5]

The importance of part-time work as a contributory factor in estimates of the gender pay gap becomes clear if we examine the scatter diagrams in figure 16. Here the correlation between hourly wage gender pay gaps and the incidence of part-time work among women is weak; by contrast, the correlation is strong and positive when monthly wage gender pay gaps are scattered against the incidence of part-time work among women. No such marked contrast is apparent in figure 17, which presents the same variables in the same relation for men. Although the reasons for working part time are diverse, recent estimates suggest that more than half of all part-time work is involuntary in Bulgaria, Cyprus, Italy, Romania and Spain (ILO, 2016b). If a large proportion of women working part time are doing so out of necessity rather than choice, any estimate of the gender pay gap using monthly earnings implicitly also takes account of the cost to women of fewer full-time work opportunities. At the same time, many women may choose to work part-time because domestic chores and care responsibilities continue to fall mainly on their shoulders (ILO, 2018d).

The third observation to make at this point is that mean and median values can generate very different results even if we use the same pay definition; that is, whether we compare mean and median hourly wages (figure 14) or mean and

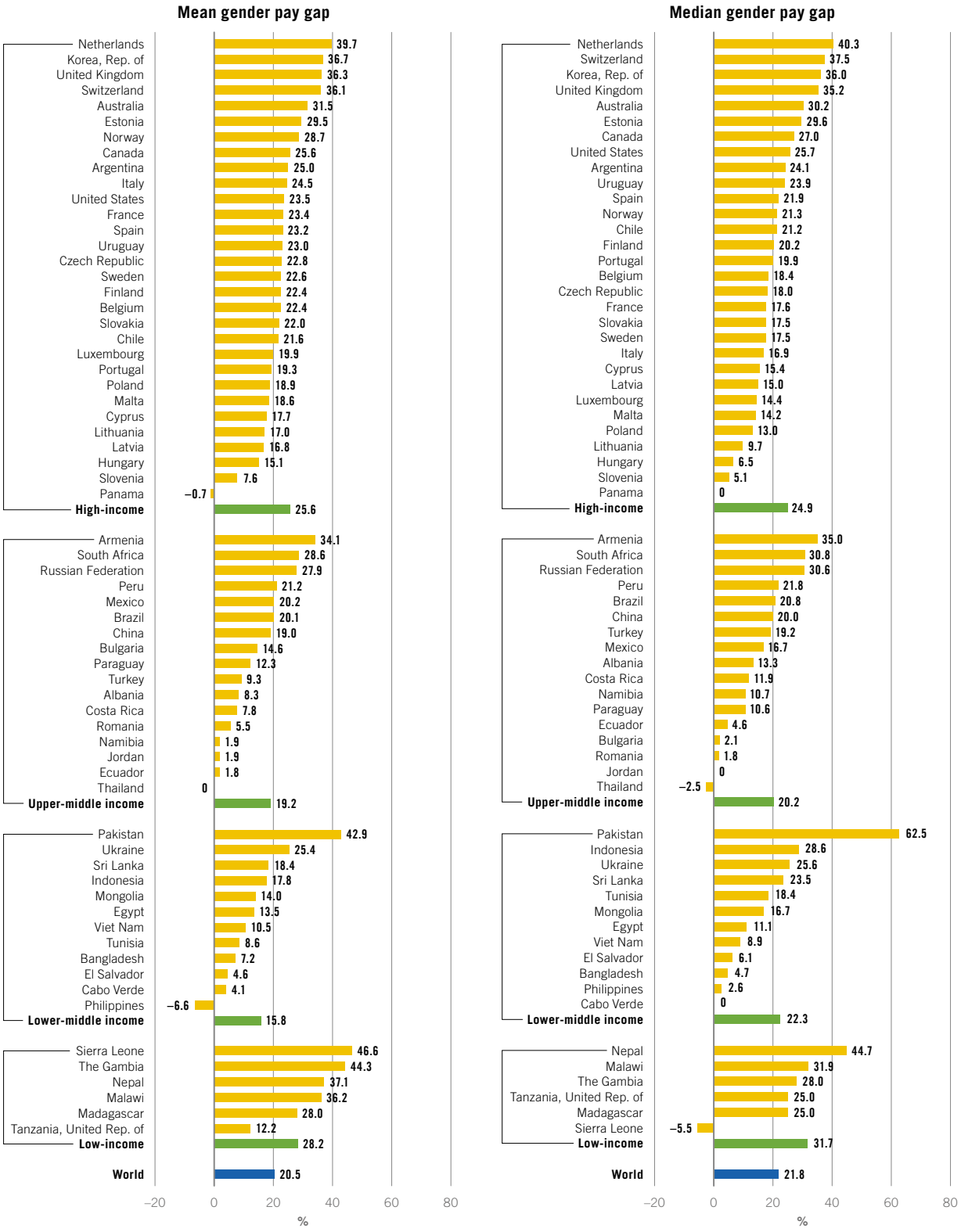
5. In most of the countries for which we have data, the status of "part time" is declared by the survey respondent, either directly as an indicator (e.g. in the Eurostat Structure of Earnings Survey (EU-SES)) or because the respondent declares the number of months per year spent in part-time employment (e.g. EU Statistics on Income and Living Conditions (EU-SILC)). When the information is not directly available in the data, we derive it from declared hours of work per week, using the OECD definition of part-time workers as those who declare their usual working time per week as 30 hours or fewer (van Bastelaer, Lemaître and Marianna, 1997).

Figure 14 Gender pay gaps using hourly wages



Source: For 65 of the 73 countries shown in the figures, the mean and median estimates are ILO estimates based on survey data provided by national sources (described in Appendix V). For eight of the countries shown, the surveys available to the ILO do not provide adequate information to construct hourly wages, so for these the mean hourly wage estimates presented here are based on external sources. In the case of Austria, Croatia, Denmark, Germany, Greece, Iceland and Ireland the estimates are from Eurostat; in the case of India, the estimate is from the ILO *India Wage Report* (ILO, 2018b). In these eight cases, the median gender pay gap cannot be reported.

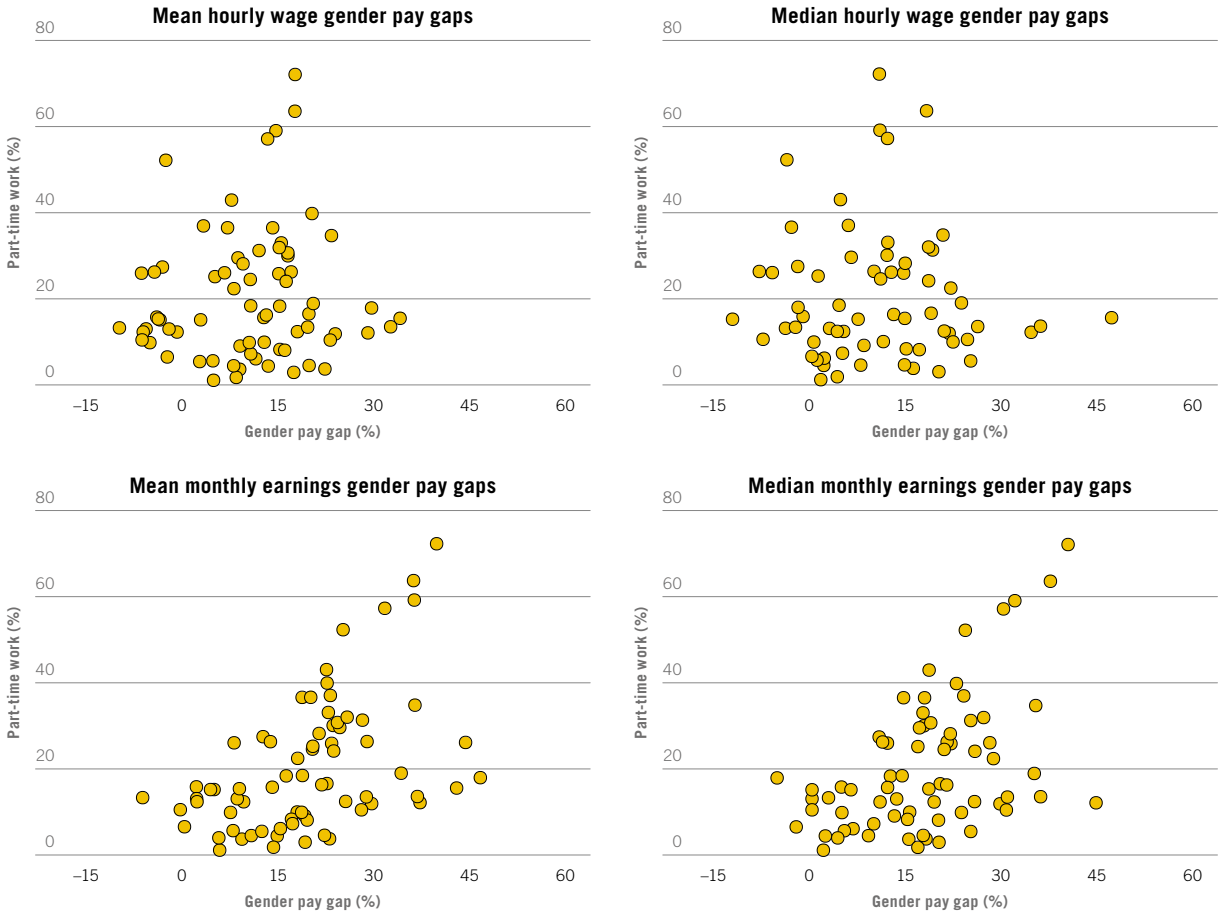
Figure 15 Gender pay gaps using monthly earnings



Source: ILO estimates based on survey data provided by national sources described in Appendix V. The eight countries for which the ILO has no appropriate data are excluded. Therefore, the set of countries in figure 15 is the same whether we use mean or median monthly earnings. Countries with an apparently zero gender pay gap in fact have negligible values. If zero is located to the left of the vertical, this indicates that the almost-zero value is negative (for example Thailand, where the mean gender pay gap is in fact –0.043); if zero is located to the right of the vertical, the almost-zero value is positive (for example Cabo Verde and Jordan, for the median gender pay gap).

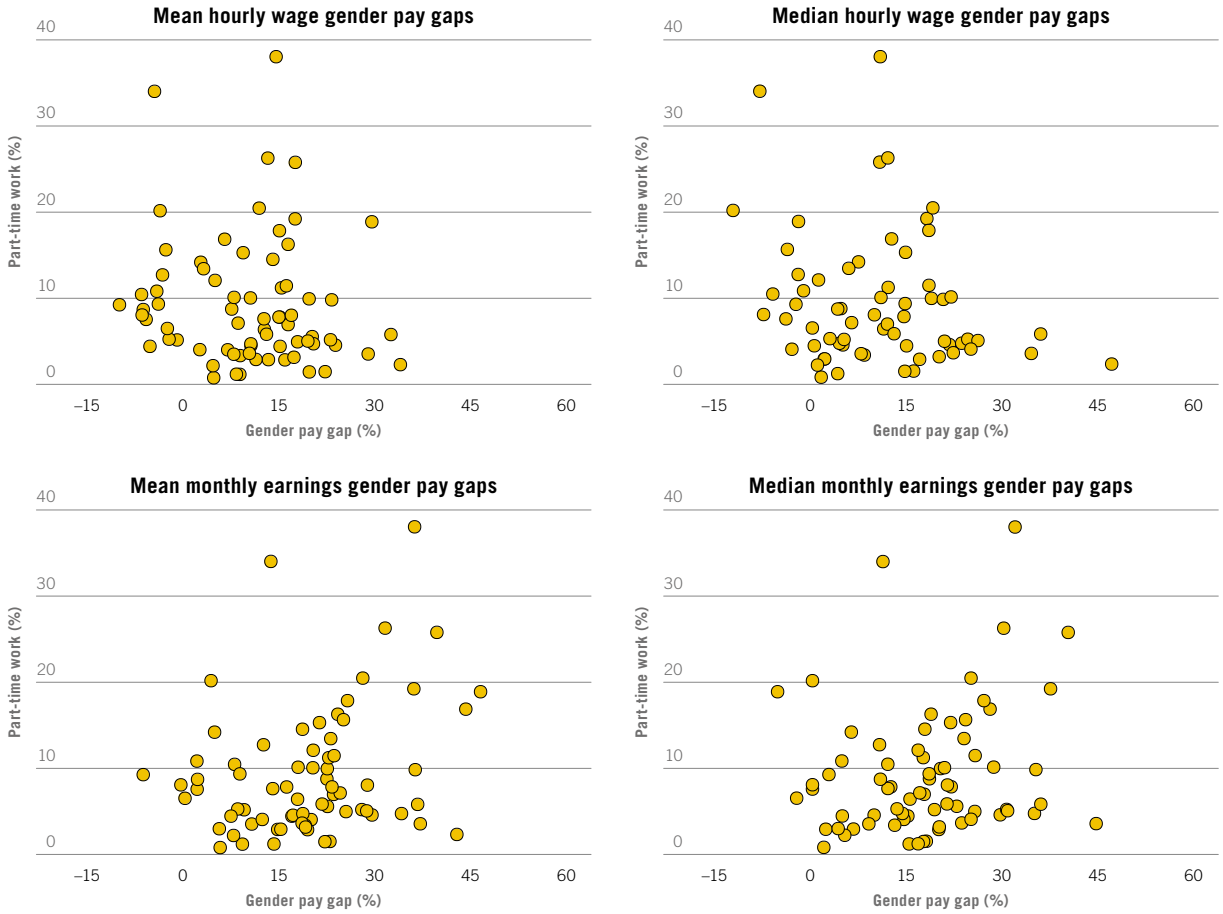
median monthly earnings (figure 15). In the case of Namibia, for example, the mean hourly wage gender pay gap is −6.5 per cent and the median hourly gender pay gap is +4 per cent; the mean value implies that women earn more than men, whereas the median value implies that women earn less than men. There are subtle differences in the use and interpretation of these two summary measures, but both are used in deriving conclusions on the difference in pay between women and men. Such apparent contradictions between findings generated using these two measures can become an obstacle in advancing policies towards gender pay equity – not only when the indicators contradict each other in sign, but also when they carry the same sign (positive or negative) but vary markedly in magnitude. For example, in the case of Bulgaria, the mean hourly wage gender pay gap is 13.2 per cent, while the counterpart median hourly gender pay gap is 1.9 per cent. Selecting the latter estimate to represent the situation in respect of gender pay equity, policy-makers in Bulgaria could justifiably claim that the country is close to achieving gender pay

Figure 16 Pay gaps and the incidence of part-time work among women



Source: ILO estimates based on survey data from up to 72 countries (see Appendix V). The correlation coefficient between mean hourly wage gender pay gap and women's incidence of part-time work is 0.08; with median hourly wage, –0.04; with mean monthly earnings, 0.48; and with median monthly earnings, 0.42.

Figure 17 Pay gaps and the incidence of part-time work among men



Source: ILO estimates based on survey data from up to 72 countries (see Appendix V). The correlation coefficient between mean hourly wage gender pay gap and men's incidence of part-time work is –0.12; with median hourly wage, –0.21; with mean monthly earnings, 0.28; and with median monthly earnings, 0.13.

parity; but then the question remains: what lies behind the 13.2 per cent figure for the estimated mean gender pay gap?

The next section of the report is devoted to exploring the reasons why gender pay gaps based on mean and median values can differ. The analysis shows that these differences are in fact related to the different way in which women and men wage employees are dispersed across the wage distribution.

8.2 Going beyond the raw gender pay gap

Figure 14 displays estimates of mean and median hourly wage gender pay gaps for 65 of the 73 countries in our database. These 65 countries can be classified in five groups. In group 1 (25 countries) the mean and median gender pay gaps are both positive, and the former is larger than the latter; in group 2 (23 countries) the mean and median gender pay gaps are again both positive, but the mean gender pay gap is smaller than the median gender pay gap; in group 3 (nine countries) the

mean and median gender pay gaps are both negative; in group 4 (six countries) the mean gender pay gap is negative but the median gender pay gap is positive; and in group 5 (two countries) the mean gender pay gap is positive and the median gender pay gap is negative.

In the majority of these 65 countries the estimates are consistent in sign – that is, either both the mean and the median gender pay gap are positive, or both are negative – although, as figure 14 shows, such consistency does not necessarily preclude a wide variance in magnitude; in many of the 57 countries for which the sign is consistent, the difference in value between mean and median gender pay gaps is sizeable, as with the Bulgarian example cited in section 8.1 above.

One way to understand the reasons why estimates of the mean and median gender pay gaps may differ so much is to visually inspect the wage structure of women and men. We illustrate this with a selection of countries from different income groups. Having classified the 65 countries into five groups, we note that all the countries in groups 3–5 – that is, those that display a negative mean or median gender pay gap, or both – are (with the single exception of Luxembourg) either low- or middle-income countries. Similarly, most countries in group 2 (excepting Canada, the Republic of Korea, Portugal, Switzerland and the United States) are low- or middle-income countries. By contrast, most countries in group 1 (except for Malawi, Mexico and Mongolia) are high-income countries. On the basis of these observations, we have made a selection of countries that includes examples from all five groups and also covers both high-income countries and middle- or low-income countries.

Figure 18 compares the hourly wage distribution of women to the hourly wage distribution of men for these countries. For each of these countries the illustration presents the hourly wage structure in two formats (explained in box 2), namely, the probability density function (first column) and the cumulative distribution function (second column). For simplicity, we will refer to these as the probability and cumulative distribution functions, respectively. The two formats complement each other in illustrating why in many cases the mean and median gender pay gaps vary significantly in size or sign. Box 2 takes the example of Finland in figure 18 to illustrate these two ways of analysing the wage structure in a given country.

Figure 18 (pages 32–36) shows that, for most countries, the probability distribution functions for women and men across the range of hourly wages (first column) do not display the smooth bell shape that appears in the case of Finland. In fact, for the majority of countries in our illustrative selection, the charts show distributions with peaks and troughs, indicating that wage earners are not smoothly or regularly distributed across the range of hourly wages. In a wage distribution characterized by such irregularities, the two summary measures most often used to synthesize the wage structure into a single number, the "mean" and the "median", provide information that can be of limited use.

This may be illustrated by looking, for example, at the case of Portugal. In this country, a large proportion of women receive the minimum wage, and this is reflected in the sharp rise of the curve at the minimum wage level, which is located at the lower end of the wage distribution; in fact, the median hourly wage for women in Portugal (indicated in the chart by the vertical broken line) is not too far

Box 2 Probability versus cumulative distribution functions: An illustrative example

A *probability density function*, usually called simply a "density function", is a device that shows how individuals are dispersed across a range of values – in the present case, the range of hourly wages. The first column in figure 18 shows precisely this device (for simplicity called "probability distributions") for each of the selected countries, separating the sample to distinguish between women and men. In order to explain how to read these figures, we have selected Finland as an example. The horizontal axis represents the range of hourly wages from lowest to highest. Each of the two curves – for women and men, respectively – maps each value of the hourly wage with the probability of finding that value among wage employees in the country, the probability being shown in the values on the vertical axis. Individuals who earn extremely low hourly wages are rarely found, so both curves are relatively flat at the low end of the wage spread. As the curve moves along from left to right we move from lower to higher wages, and the probability of finding wage earners in the population at each level starts to increase: this is shown by the rise of the two curves as higher hourly wages are mapped to higher probability values in the vertical axis.

It is interesting to note that in the case of Finland, as with most other countries, the women's curve takes off from the floor at an earlier point than the men's curve. This simply reflects the fact that the probability of finding a woman at lower values of the hourly wage range (above the extremely low level) is higher than that of finding a man at these values. At around the middle of the wage range, the curves stop rising and start to fall, indicating that, for either men or women, after some specific wage the chances of finding a higher-wage earner – compared to one earning a wage in the middle of the range – start to fall. It is interesting to note that in the case of Finland, as in many other countries, soon after the peak value in the women's curve, the probability of finding a man at the higher-wage values is higher than that of finding a woman: this is clear because from somewhere in the middle of the hourly wage range the curve for men is consistently above that for women. Thereafter, and as the two curves approach the top values of the hourly wage range on the horizontal axis, the probability of finding either male or female wage earners gradually declines. This is shown by the two curves returning progressively to the zero value on the vertical axis. In the case of Finland, as for many other countries illustrated in figure 18, the probability of finding a woman at the upper extreme of the hourly wage distribution is zero: the women's curve stops before the men's curve. Overall, these rises and falls result in a sort of bell-shaped curve, which can be more or less regular, more to the right or more to the left, with longer or shorter tails; it is these features of the bell shape that characterize and describe the distribution of wages earners in a country.

A complementary and equally necessary instrument in studying a country's wage structure is a calculation to show how the wage distribution translates into the accumulation of wage employees at each value of the range of wages. This is known as a *cumulative distribution function* and is presented for each of our selected countries in the second column of figure 18 (for simplicity called "cumulative percentages"). What the hourly wage cumulative distribution does is to plot a curve mapping the proportion of wage employees that has accumulated up to each value of the hourly wage distribution. From left to right on the horizontal axis, the higher the value of the hourly wage, the greater the share of wage employees that has accumulated at or below that hourly wage, with the accumulation of individuals going from nearly 0 per cent at the lowest hourly wage to 100 per cent (or the total population of wage employees) at the highest possible hourly wage.

Continuing with our example of Finland, we see that the curve showing how women accumulate successively as hourly wages increase takes off from the zero value at an earlier hourly wage value than the curve for men; this shows that the proportion of women accumulates at lower values faster than that of men. The hourly wage at which 50 per cent of the population accumulates is the median, as shown by a broken horizontal line in each of the charts in column 2. In the case of Finland, the broken horizontal line shows that the women's median hourly wage is at a lower level than the median hourly wage for men. Also, in the case of Finland, the curve showing how women accumulate along the range of hourly wages is consistently to the left of the same curve for men: that is, for the same proportion of women and men wage employees – as indicated on the vertical axis – that proportion of women always earn an hourly wage that is below the hourly wage earned by the same proportion of men wage employees.

away from the peak that marks the minimum wage, thus suggesting that a large proportion of them have earnings in the region of the minimum wage. However, the mean hourly wage for women in Portugal (indicated in the chart by the vertical solid line) is much higher than the median, and far from the minimum wage. This is because there are small clusters of highly paid women – illustrated by the small peaks in the upper ranges of the women's wage distribution – whose hourly wages are pulling up the mean wage for all Portuguese women wage employees. Thus, mean and median gender pay gaps can differ because of irregularities in the way in which wage employees are dispersed across the range of hourly wages.

If we now explore the wage distribution for Cabo Verde, we observe that a substantial proportion of women are located at the higher end of the wage distribution; these women pull the mean up, but that mean is not representative for most women wage earners in the population. Looking at the cumulative distribution, this shows that up to about the 40th percentile women earn wages below those of men, but from about the 40th to the 90th percentile women's earnings are above men's earnings; and from the 90th percentile to the very top earners the reverse is again true. Therefore, depending on which cumulative share of wage employees is selected, we could conclude that women earn more than men or that women earn less than men. This example illustrates again that a single summary measure such as the mean or the median cannot capture the complexity of the underlying wage distribution.

Figure 18 shows that, without exception, in all countries where the mean and median gender pay gaps are both positive, the cumulative proportion of women wage employees at any level always earn an hourly wage that is below the hourly wage earned by the same proportion of men wage employees. This is clear because for all these countries, the curve illustrating the cumulative proportion of women up to a given hourly wage (column 2) is always to the left of the same curve for men. This is not the case for countries with negative mean or median gender pay gaps (groups 4 and 5), or for countries where both the mean and the median are negative (group 3). In countries where the mean and/or median gender pay gaps are negative, they are also characterized by irregular distribution functions with peaks and troughs, thus showing that populations are not smoothly or regularly distributed across the range of hourly wages. It is rare for these countries' wage distributions to display long upper tails. In almost all cases the lower tails are long: this is a characteristic of emerging and low-income countries, where a significant fraction of wage employees are located at the low end of the wage distribution, while a less representative smaller fraction receive wages at the upper end of the wage distribution.

We can also see from figure 18 that irregularities in the probability distributions displayed in column 1 are more likely to occur in the case of women than in the case of men; in many instances, where women's and men's wage distributions are both somewhat irregular, the peaks and troughs in the wage structure are more marked for women than for men. The reason why peaks and troughs occur across the wage distribution is that women and men cluster around specific hourly wages. For example, in many cases a clustering occurs around the minimum wage, and in many of those cases the probability of finding women at that wage level is higher

than that of finding men there. At the same time, all countries with negative mean and/or median gender pay gaps display probability distributions characterized by small clusters of women at either end of their respective wage distributions, most markedly at the upper end; these are mostly middle- and low-income countries characterized by low labour market participation rates of women in general, and in wage employment in particular. What the clustering indicates is that women are concentrated in specific ranges of hourly wages reflecting their "selective" labour market participation. In the case of Egypt, for example, there is no representation of women at all at the extreme low end of the wage distribution; some peaks are visible, indicating small clusters around wages up to the mean and median hourly wages; thereafter, the distribution shows a cluster of more highly paid women located towards the upper end of the wage spectrum.

One problem with the simple measure of the gender pay gap is that in countries where the participation of women in wage employment is low, estimates of the gender pay gap generated by the classic mean and median measures are completely dominated and distorted by these clustering or composition effects, resulting in estimates that are difficult to interpret for the purpose of policy-making or the monitoring of trends. In countries where women's participation as wage employees is high – mainly high-income countries and some middle-income countries – the probability of finding women across the wage distribution is also high; but even in these countries the existence of clusters and composition effects can somewhat distort estimates of the gender pay gap. The next section thus proposes a methodology to generate complementary estimates of the gender pay gap that considers these composition effects.

Figure 18 Wage structures, selected economies

Group 1: The mean and median gender pay gaps are both positive, but the mean is larger than the median (selection plotted)

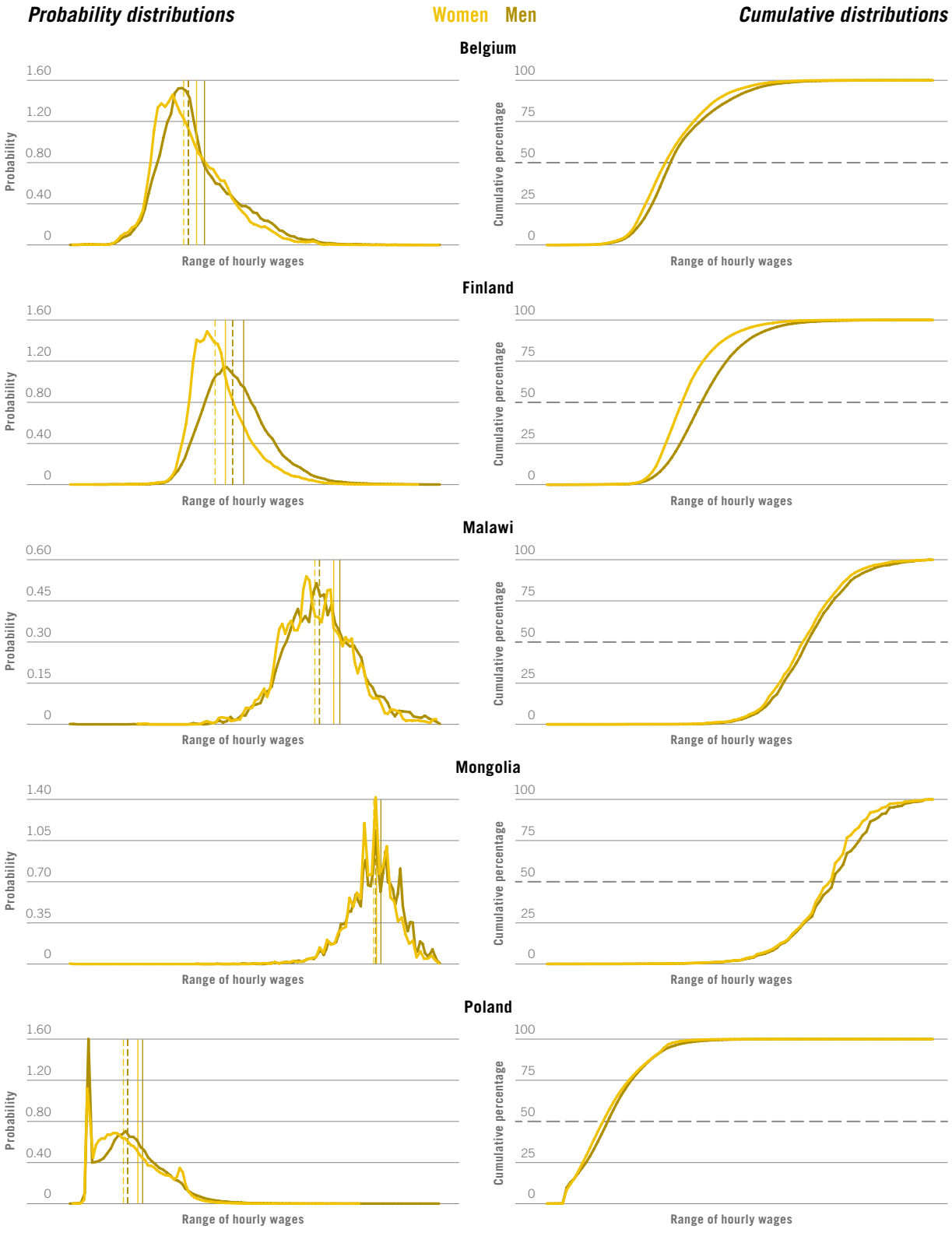


Figure 18 (cont'd)

Group 2: The mean and median gender pay gaps are both positive, but the mean is smaller than the median (selection plotted)

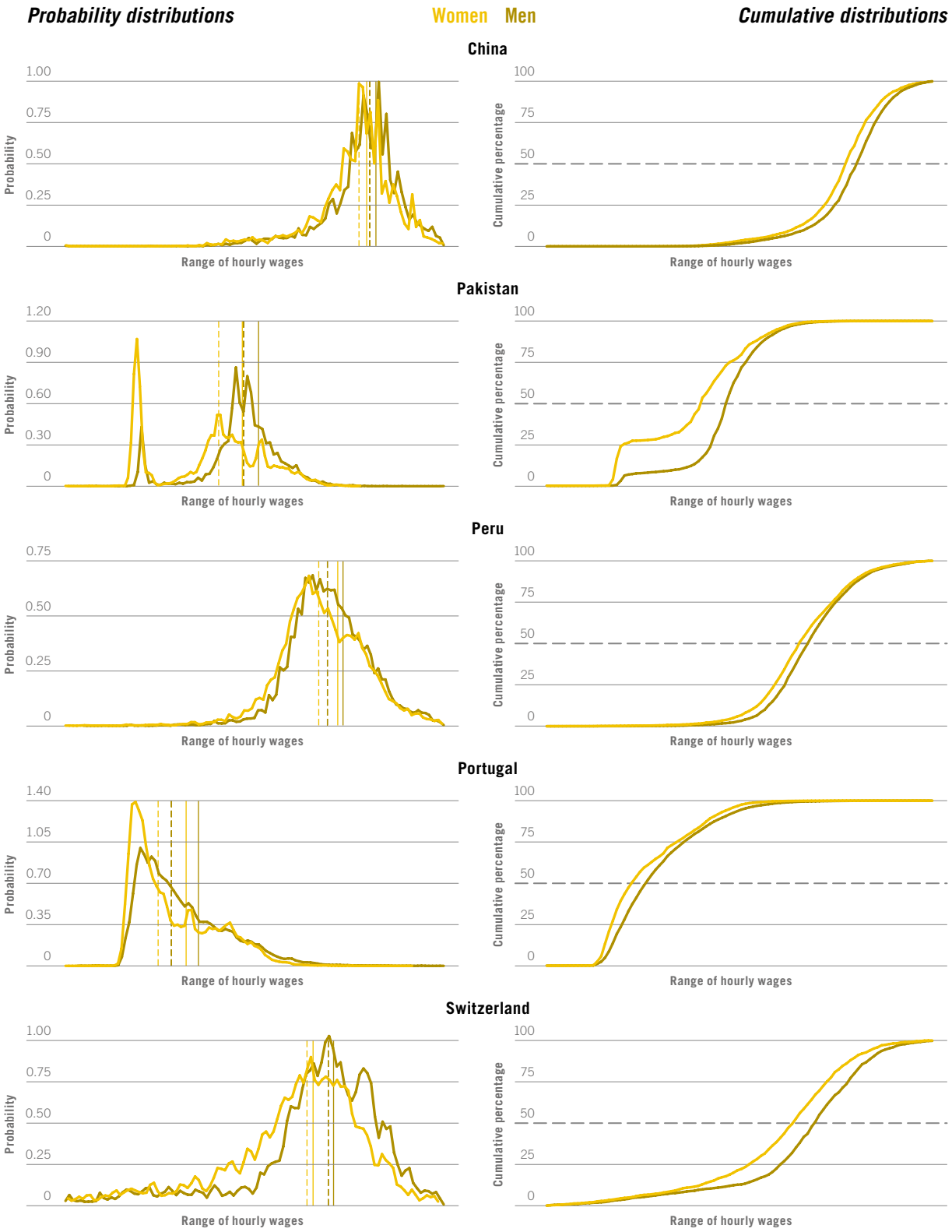


Figure 18 (cont'd)

Group 3: The mean and median gender pay gaps are both negative (selection plotted)

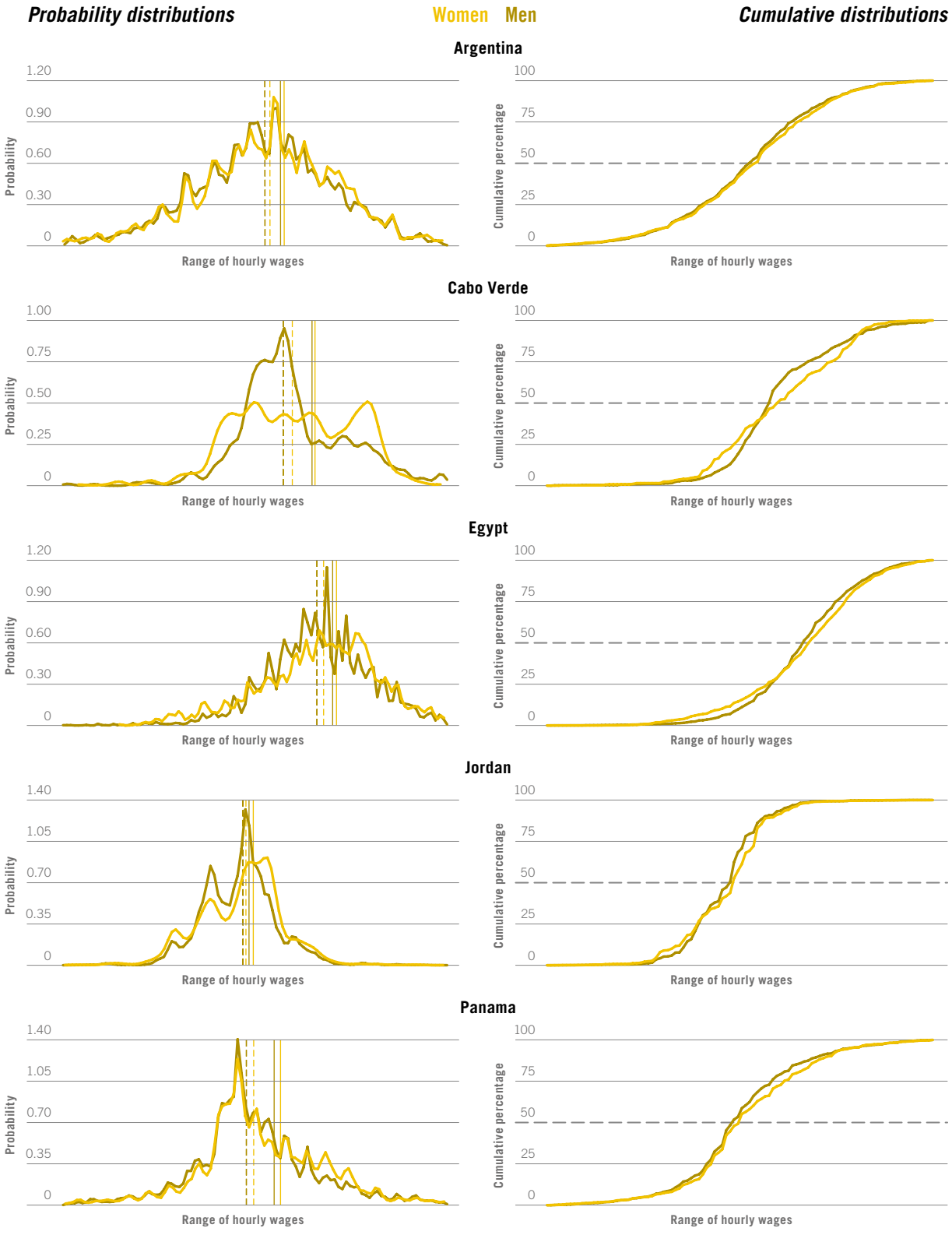


Figure 18 (cont'd)

Group 4: The mean gender pay gap is negative and the median is positive (selection plotted)

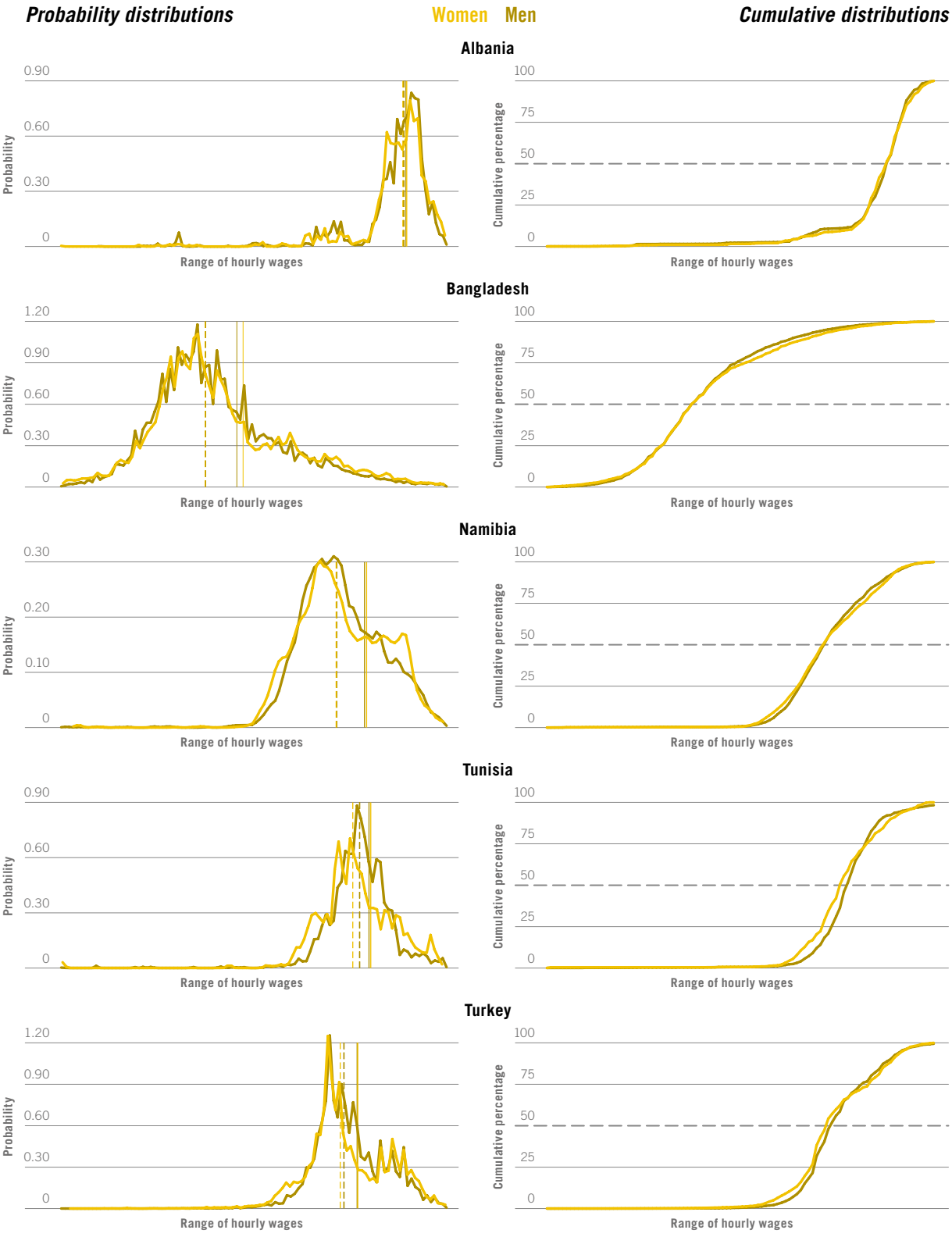
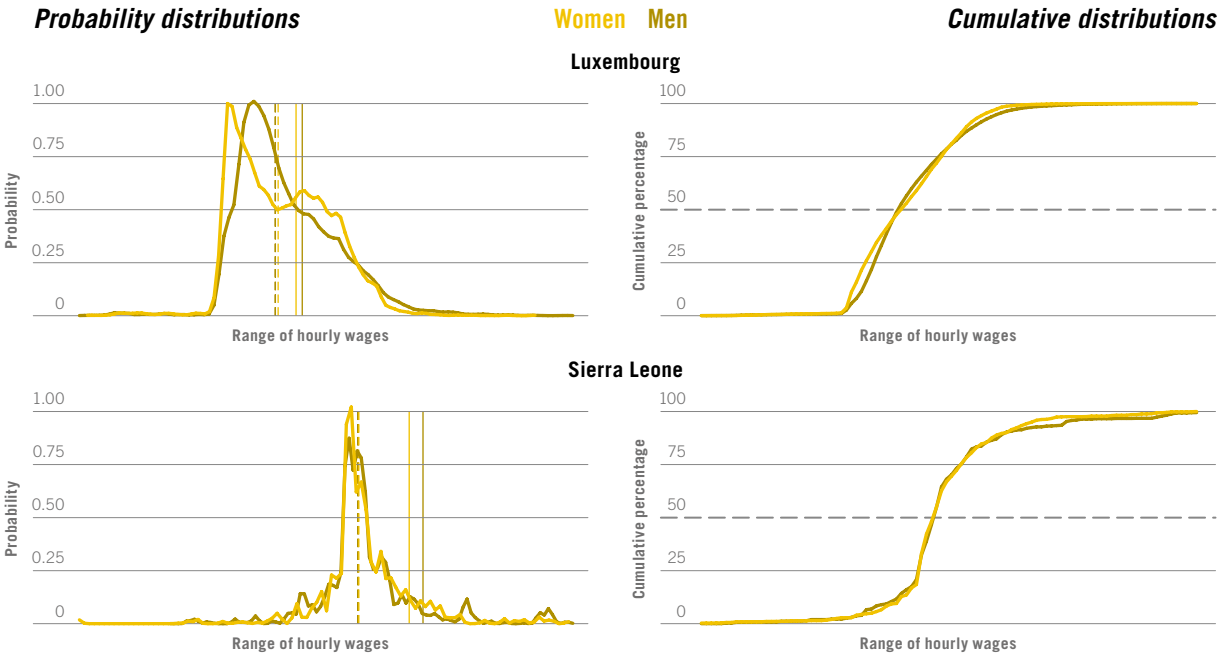


Figure 18 (cont'd)

Group 5: The mean gender pay gap is positive and the median is negative (both plotted)



Source: ILO estimates. All estimates are based on drawing the wage structure using the transformation of hourly wages into natural logarithms. The broken vertical lines in the probability distribution function show median values for women and men, respectively; the solid lines show the mean values for each gender. The broken horizontal line in the cumulative distribution function shows the point at which the population of wage employees is distributed 50:50; at that point the horizontal reading of the curves (women and men independently) show the value of the hourly wage at the median. The value is not shown on the horizontal axis, but the broken line helps to indicate the relative locations of the women's median and the men's median hourly wage.

8.3 A complementary measure: The factor-weighted gender pay gap

This section of the report proposes and illustrates a method for generating estimates of the gender pay gap that removes some of the major composition effects caused by the existence of clusters. In essence, we group women and men wage employees into more homogeneous subgroups, and then estimate the gender pay gap in each of the subgroups. We then construct a weighted sum of all the subgroups' specific gender pay gaps, with the weights reflecting the size of each subgroup in the population. Thus we arrive at an alternative to the classic way of estimating the gender pay gap – an alternative we call the "factor-weighted gender pay gap". Box 3 illustrates in some detail the procedure of estimating a factor-weighted gender pay gap for one country (Egypt).

What subgroups should be selected? Drawing on the human capital model (Mincer, 1974), it is widely accepted that education and labour market experience (age serving as an approximation of the latter) are two important indicators of the job profile of wage employees. It is also acknowledged that women and men differ in their labour market participation by their hours of work – women are more likely than men to work part time. Furthermore, in almost all countries for which we have data, women wage employees are more likely than men to work in the public sector rather than the private sector. Thus we can take the factors

Box 3 The factor-weighted gender pay gap: An illustrative example

A factor-weighted gender pay gap is arrived at by first selecting a set of indicators (factors), which are important determinants of wage structures, to cluster women and men in comparable subgroups. Four factors have been highlighted as particularly relevant for the purpose, and easily available in most survey databases. These are "education", "age", "working-time status" (that is, full time versus part time) and "private-sector versus public-sector employment". These factors are applied to distribute the sample into subgroups. It is preferable to keep the number of subgroups reasonably small so that one does not end up with subgroups where a few individuals, who may or may not be representative of their group, dominate the outcome. Using the proposed four factors, the variables "education" and "age" are divided into four categories each. The variables "full-time versus part-time" and "private versus public sector" already define two categories each. Altogether, then, these four factors generate a total of (at most) 64 subgroups, as the result of interacting $4 \times 4 \times 2 \times 2$ major subgroups. Once the subgroups are formed, the next step is to estimate the subgroup-specific gender pay gap for each – using mean and median, respectively. The final step is to estimate the factor-weighted mean and median gender pay gaps, summing the weighted values of the (at most) 64 subgroups. The weight for each subgroup is its proportional representation in the population of wage employees, so the (at most) 64 subgroup weights will sum up to 1. Applying these weights and summing up the weighted subgroup gender pay gaps leads to a single value that we call the mean or median factor-weighted gender pay gap.

The table below, using the example of Egypt, provides some details to illustrate the mechanism described above and shows the effect of "clusters" in the estimation. The first four rows show the hourly average wage received by each subgroup defined according to educational level and whether they hold employment in the private or public sector. The next three rows show the proportional representation of each group to the total population of wage employees. For example, Egyptian women educated to university degree level or above who work in the private sector are paid 4.8 Egyptian pounds (EGP) per hour; this group represents 36 per cent of all Egyptian women who work in the private sector. Overall, however, women and men educated to university degree level or above represent only 17.2 per cent of all women and men who work in the private sector; so this is the weight that the EGP4.8 would receive in a weighted calculation that broke the sample down according to educational level and public- versus private-sector employment.

One thing we observe from this table is that there is a positive gender pay gap in all cells defined by education and economic sector. In Egypt, nearly 74 per cent of women wage employees work in the public sector, and of these 58.5 per cent are highly qualified and are pushing the average hourly wage higher for all women, while the fact that a significant proportion of men are located in lower educational categories – in particular those working in the private sector – pulls the men's average wage down. The result is a negative gender pay gap, as illustrated in figure 14, even though within each of the subgroups defined by education and private or public sector, the gender pay gap is always positive. Although not all possible subgroups (of which there may be at most 64) are illustrated in the table, once the composition effects are accounted for by weighting up the (at most) 64 subgroups the gender pay gap becomes positive, as illustrated in figure 19.

"education", "age", "working-time status" and "public-sector versus private-sector employment" as the four indicators that together will pick up the major composition effects in most, if not all, economic contexts. Whereas "education" and "age" are in line with the human capital model, the inclusion of "working-time status" and "public-sector versus private-sector employment" incorporate a specific

Box 3 (cont'd)

Table 8.1 Details of the factor-weighted gender pay gap for Egypt

Educational level	Private sector			Public sector		
	Women	Men	Men and women	Women	Men	Men and women
Average wages per hour (in EGP)						
Below secondary	3.4	4.5	4.4	3.4	4.4	4.3
Secondary/vocational	3.0	4.6	4.5	5.9	6.1	6.1
University and above	4.8	6.0	5.8	6.5	7.7	7.2
Overall weighted average	3.8	4.8	4.7	6.2	6.4	6.3
Percentage of the total population of wage employees						
Below secondary	36.8	47.0	46.2	4.4	23.3	17.0
Secondary/vocational	27.3	37.4	36.6	37.1	36.8	36.9
University and above	36.0	15.6	17.2	58.5	39.9	46.1
Total no. of wage employees in the population						
	759874	8769701	9529575	2138373	4318519	6456892

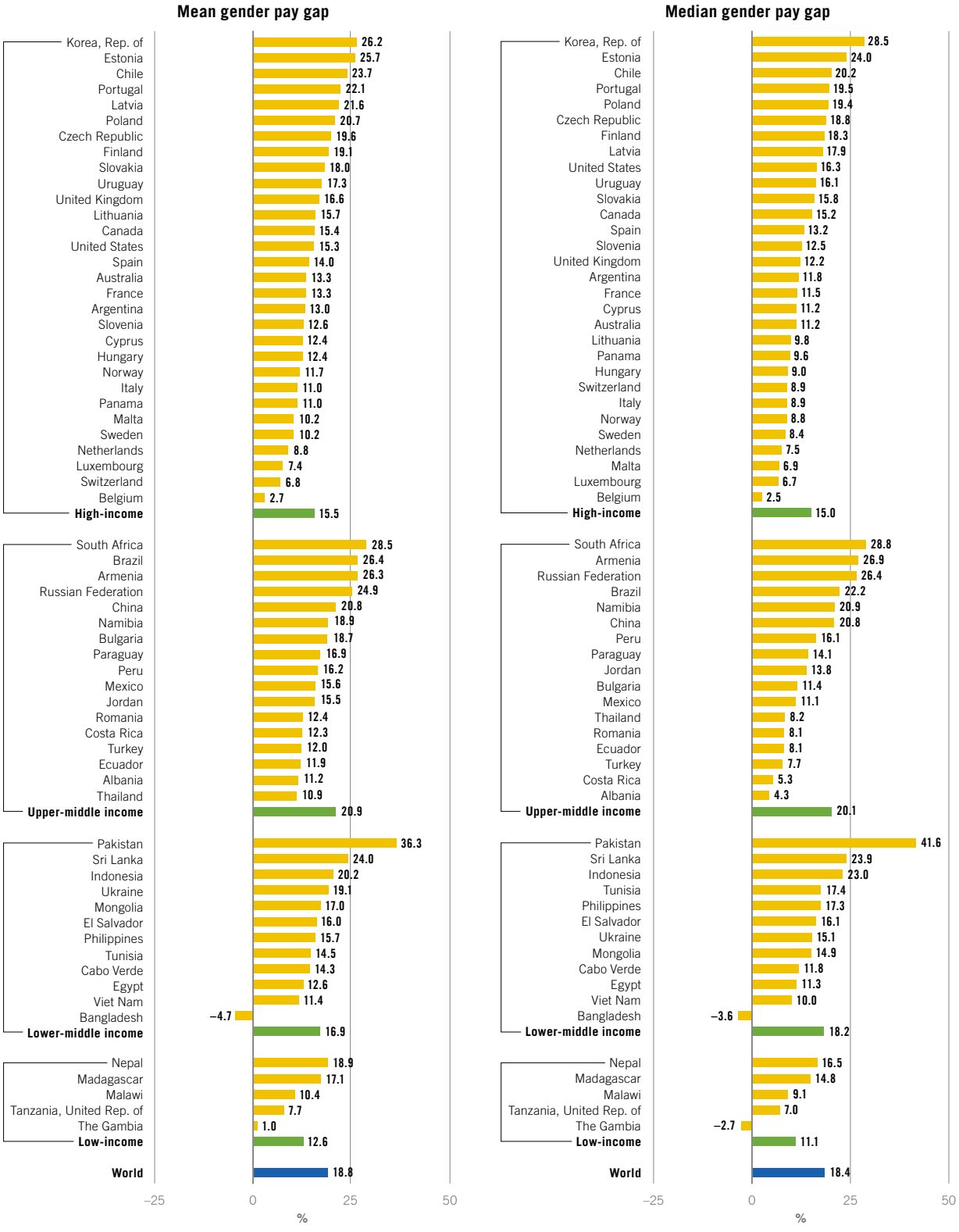
Source: ILO estimates using national representative data from Egypt; see Appendix V.

gender focus to better capture the composition effects that underlie women's and men's respective modes of participation in the labour market.

Other subgroups could in principle be constructed. However, the construction of subgroups should be driven by simple and practical criteria: indicators for this purpose should be readily available in survey data, and they should be efficient at capturing the difference between women and men in the labour market. By "efficient" we mean that using only a few subgroups should be sufficient to capture such differences. This is an important criterion; if too many subgroups are used, the within-group measure of the gender pay gap loses in precision. The four factors we have selected to reduce composition effects are all widely available in most survey data, for example, in labour force surveys or integrated household labour surveys.

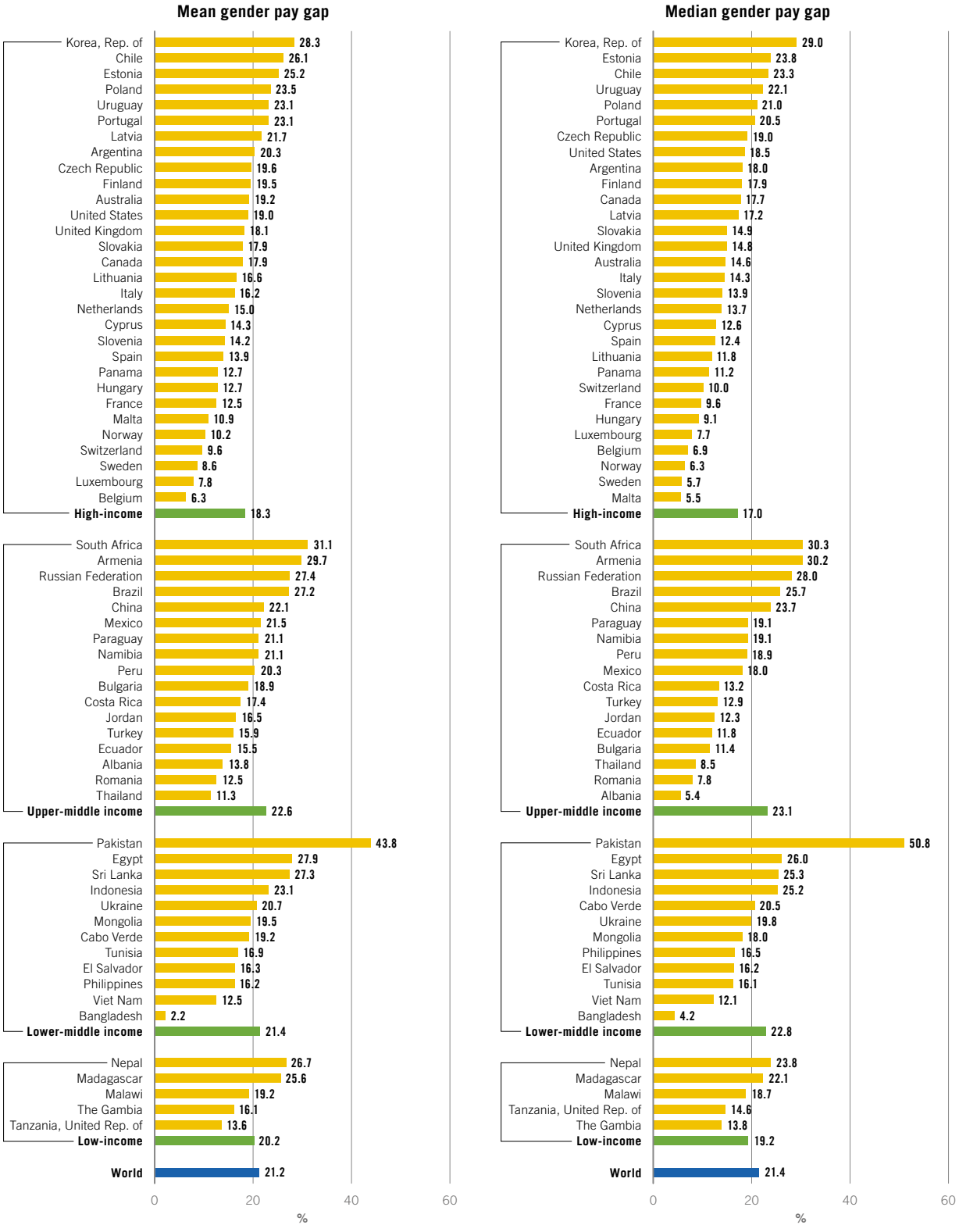
Figures 19 and 20 show the result of applying the factor-weighted method to 64 countries for which we have data. We see that with this different methodology almost all estimates of the hourly and monthly (mean and median) gender pay gaps are now positive. Figures 21 and 22 show the gender pay gap within some selected subgroups, namely in private-sector and public-sector employment, and in full-time and part-time employment. Even though there is much diversity across countries, we see that, on average, hourly gender pay gaps are higher in the private sector than in the public sector, and among part-time than among full-time employees.

Figure 19 Factor-weighted gender pay gaps using hourly wages



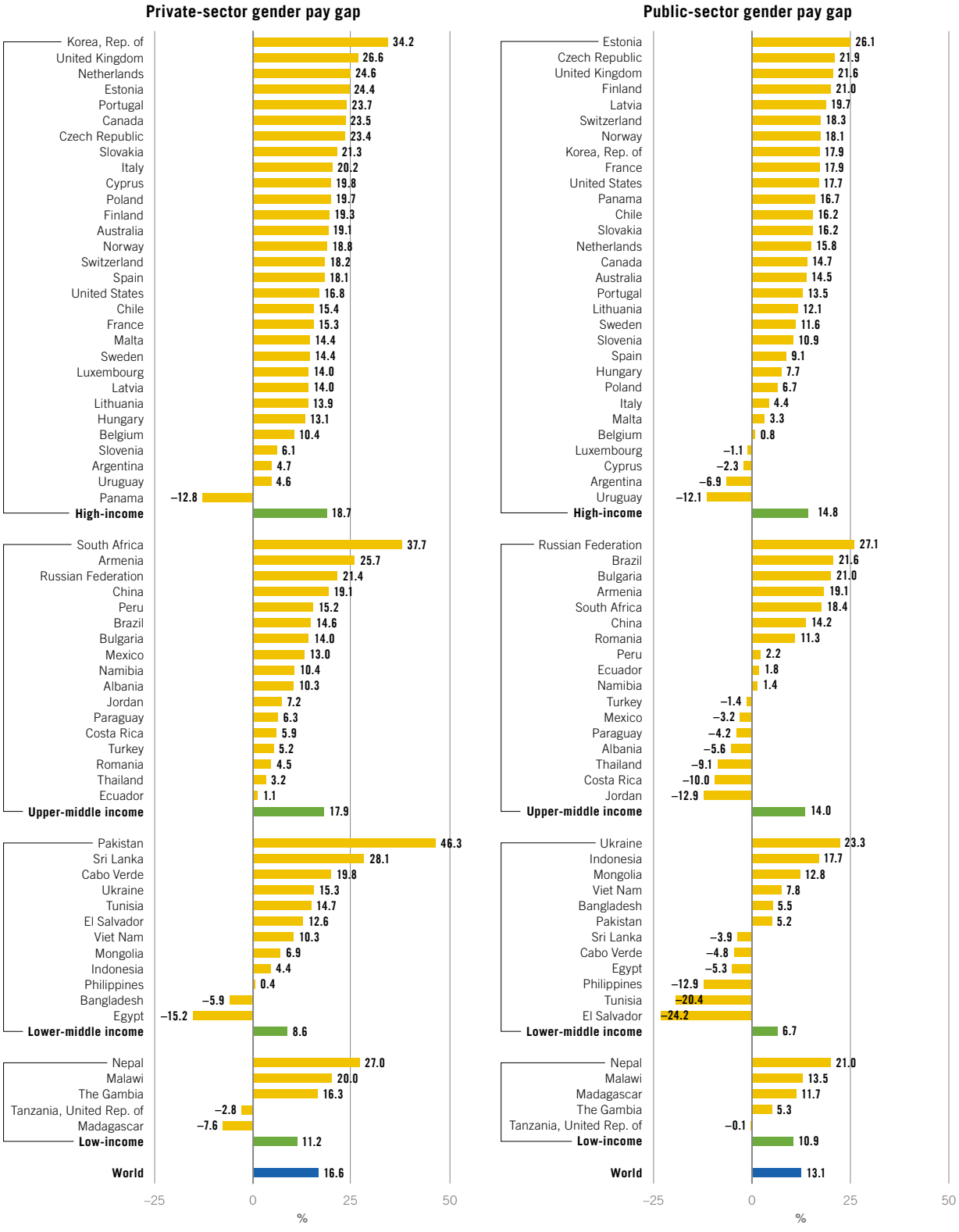
Source: ILO estimates based on survey data provided by national sources (see Appendix V). All estimates are based on the method described in box 3, grouping the population of wage employees according to education, age, working-time status and private-sector versus public-sector employment.

Figure 20 Factor-weighted gender pay gaps using monthly earnings



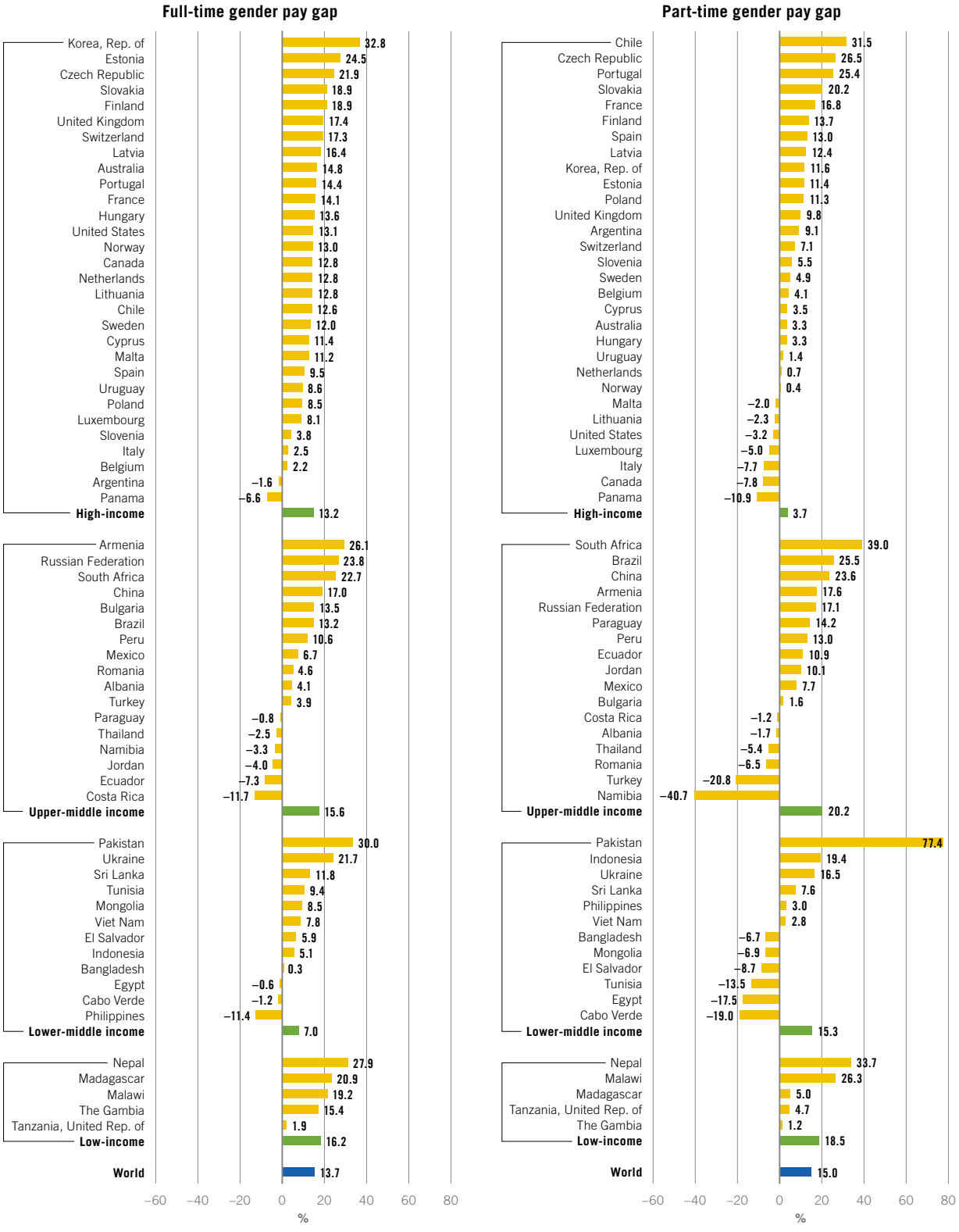
Source: ILO estimates based on survey data provided by national sources (see Appendix V). See source for figure 19 for additional information.

Figure 21 Factor-weighted gender pay gaps: Private-sector versus public-sector employment (mean hourly wages)



Source: ILO estimates based on survey data provided by national sources (see Appendix V). All estimates are based on the method described in box 3, grouping the population of wage employees according to private-sector versus public-sector wage employment.

Figure 22 Factor-weighted gender pay gaps: Full-time versus part-time employment (mean hourly wages)



Source: ILO estimates based on survey data provided by national sources (see Appendix V). All estimates are based on the method described in box 3, grouping the population of wage employees according to working-time status (full-time versus part-time wage employment).

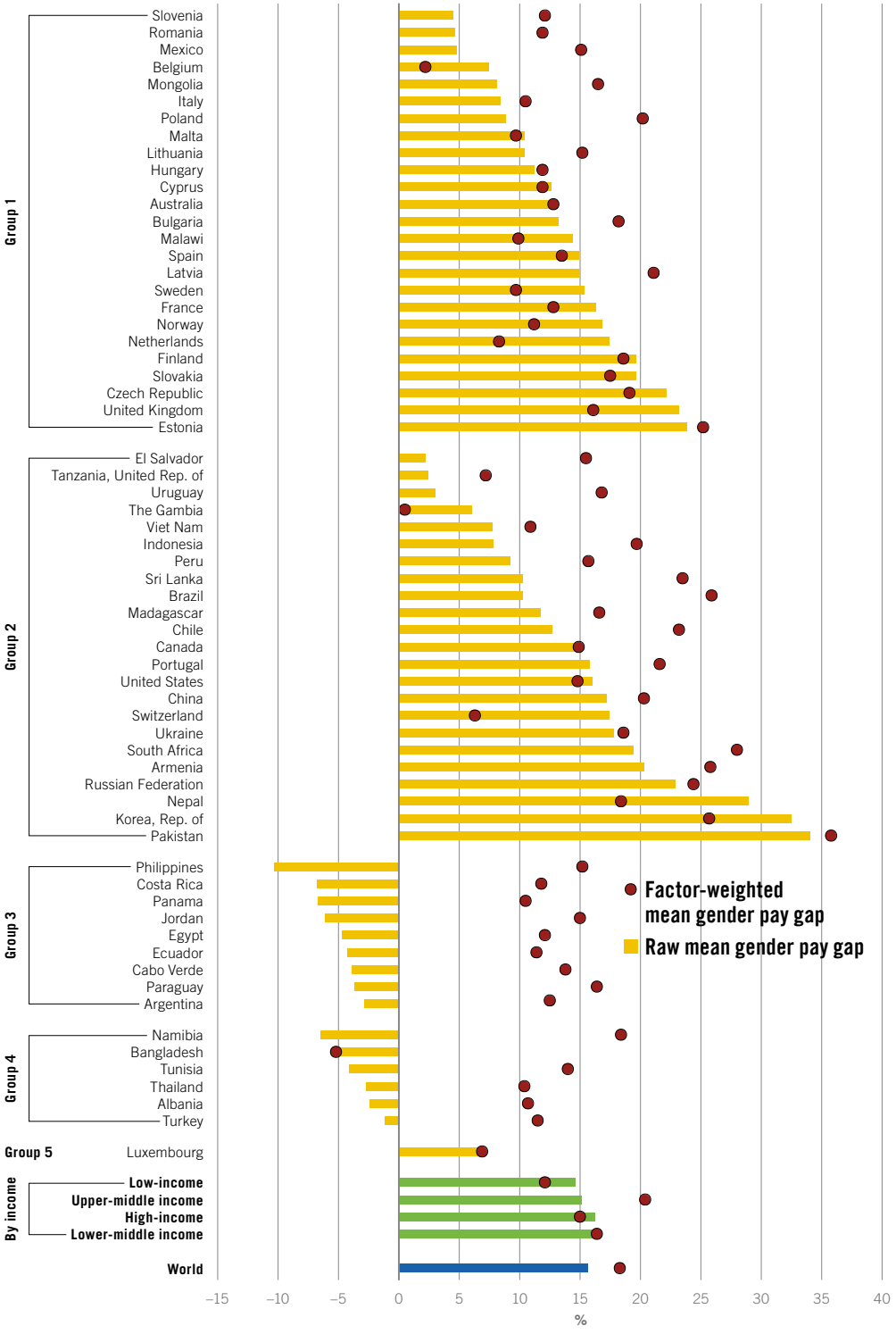
An interesting exercise is to plot the factor-weighted gender pay gap against the raw gender pay gap shown in figure 14 (using in each case the mean hourly wage), grouping these comparisons according to the five-group classification in figure 18. Figure 23 depicts the result of this comparison, and shows that using the factor-weighted method has an impact on gender pay gap estimates in almost all countries. In only one country (Bangladesh), the factor-weighted mean hourly wage gender pay gap is positive. In some cases the factor-weighted gender pay gap is smaller than the standard gender pay gap, but in most cases it is wider. In group 1 countries where the raw mean was relatively low, the factor-weighted method leads to higher values, whereas in those countries where the raw mean gap was high, the factor-weighted method seems to adjust the value downward. In the case of group 2, where the raw mean hourly wage gender pay gap was estimated below the median hourly wage gender pay gap, the factor-weighted method seems to adjust the mean gap upward. For all countries in groups 3 and 4, where the mean gender pay gap was negative, the factor-weighted method corrects the sizeable distortion of the composition effects in the population and gender pay gap estimates show that in fact women in these countries are on average paid below what men are paid. In countries with positive mean but negative median gender pay gaps (group 5), the adjusted value either increases or decreases. Finally, figure 23 also compares estimates for the simple and factor-weighted global gender pay gaps, showing that with the factor-weighted estimate the gender pay gap increases from about 16 to 19 per cent.

The case of Namibia may be used as an illustration of how estimates of the gender pay gap can turn from negative to positive with the factor-weighted method. Figure 14 suggests that in Namibia the hourly wage mean gender pay gap is negative (−6.5 per cent). However, estimates in figure 21 show that the mean hourly wage gender pay gap is positive both among workers employed in Namibia's public sector (1.4 per cent) and among workers employed in the private sector (10.4 per cent). The two subgroups together represent the complete population of wage employees in the country. Applying weights to the corresponding group-specific gender pay gaps, and summing the two values, leads to a factor-weighted gender pay gap of 2.7 per cent. This differs from the 18.9 per cent mean gender pay gap displayed in figure 19, although in that case the "weighting" is performed over several subgroups (potentially as many as 64). However, even just using a single factor – private-sector versus public-sector employment – the estimate arrives at a value that is somewhat more congruent (at least in sign) with the final and more refined estimate for Namibia in figure 19.

There are other merits to this proposed method. One advantage is that the mean and median factor-weighted gender pay gaps are closer in value than in the classic measures of gender pay gaps.[6] This is advantageous notably because the choice of mean or median is often a subjective one by researchers or analysts, and

6. With the factor-weighted method, the correlation coefficient between mean and median gender pay gaps on hourly wage in figure 19 is 92.7 per cent, compared to the 83.2 per cent correlation coefficient between mean and median gender pay gaps in figure 14; using monthly earnings, the correlation coefficient increases from 77.1 per cent (figure 15) to 90.8 per cent (figure 20).

Figure 23 Comparing raw gender pay gaps and factor-weighted gender pay gaps using mean hourly wage in both cases: Classification based on ranking countries (within five groups) by raw gender pay gap



Source: ILO estimates combining the gender pay gaps from figure 14 (bars) and figure 19 (dots).

that subjective choice of one over the other can sometimes be a source of controversy in policy-making. Using the factor-weighted gender pay gap, and thereby narrowing the distance between mean and median estimates, helps to reduce the likelihood of such controversy. Another advantage is that, because factor-weighted estimates of gender pay gaps control for some major composition effects, they lend themselves more readily to comparisons between countries. Likewise, within a single country, the factor-weighted gender pay gap controls for some composition effects that can vary over time, whether for structural or cyclical reasons; this means that a time series of factor-weighted gender pay gaps is a useful complementary tool with which to analyse the evolution of gender pay gaps over time, in a given country.[7]

7. It is important to emphasize that the proposed factor-weighted gender pay gap is not equivalent to an estimate of the adjusted gender pay gap: the latter requires the use of other techniques, for example the identification of a counterfactual distribution, to identify and exclude that part of the gap arising from differences in endowments between women and men (see Fortin, Lemieux and Firpo, 2011). This issue is addressed in the next section of the report (in particular, see section 9.2).

9 What are the factors that lie behind the gender pay gap?

Why do women generally earn less than men? We begin by estimating the gender pay gap at different points in the hourly wage distribution. This can shed light on the potential impact of different policies on the overall gender pay gap. It is thus important to know where in the wage distribution the gender pay gap is widest. To complement this information, we also estimate the proportion of women in different parts of the wage distribution, showing the extent to which women are over-represented at the lower end of the wage distribution, or under-represented at the upper end. We then seek to decompose the gender pay gap, at different parts of the distribution and overall, into a component that can be "explained" by differences in the labour market attributes of women and men and a component that is "unexplained" by such characteristics. The report goes on to discuss what lies behind the unexplained component of the gender pay gap, including the lower returns for education of women within the same occupations, the effects on wages of the feminization of occupations and workplaces, and the effect of the parenthood status of women and men on their respective wages.

9.1 Estimating the gender pay gap across the hourly wage distribution

In this section we start by estimating and analysing the gender pay gap at different points in the hourly wage distribution; in particular, at each of the nine quantiles that split the distribution into ten equally sized groups.[8] The estimation of the gender pay gap at different locations in the wage distribution is a useful tool as it can shed light on the potential impact of particular policies on the gender pay gap. For example, introducing a minimum wage could reduce the gender pay gap at lower wage levels, collective pay agreements could have the same effect in the middle of the wage distribution, while policies that promote a greater representation of women in senior and highly paid positions could have a positive effect at the top levels.

Figure 24 shows the gender pay gap at each quantile (Q1–Q9) of the hourly wage distribution for a selection of countries that covers the four income groups (high, upper-middle, lower-middle and low). The first thing to note is that the gender pay gap varies across the distribution for all countries shown in the illustration.

8. A quantile is a value of a distribution that splits the data into equally sized groups. For example, the median is a threshold value that splits the data into two equally sized groups; a quartile is one of the three threshold values that splits a distribution into four equally sized groups; and a decile is one of the nine threshold values that splits a distribution into ten equally sized groups. The term "quantile" is a term that encompasses all these various terms (median, quartile, decile, centile, etc.), as long as the threshold serves to split the data into equally sized parts. This report will use the term "quantile" unless it is necessary to distinguish explicitly a specific division of the distribution into non-equal parts. The consistent use of the term "quantile" avoids confusion with the fact that the term "decile" is sometimes also used to refer to the average value of the distribution between two of the nine thresholds of a distribution split into ten parts. In this report, the terms "quantile", "decile" or "centile" always refer to thresholds in the distribution.

Figure 24 Gender pay gaps across the wage distribution for selected countries, latest years

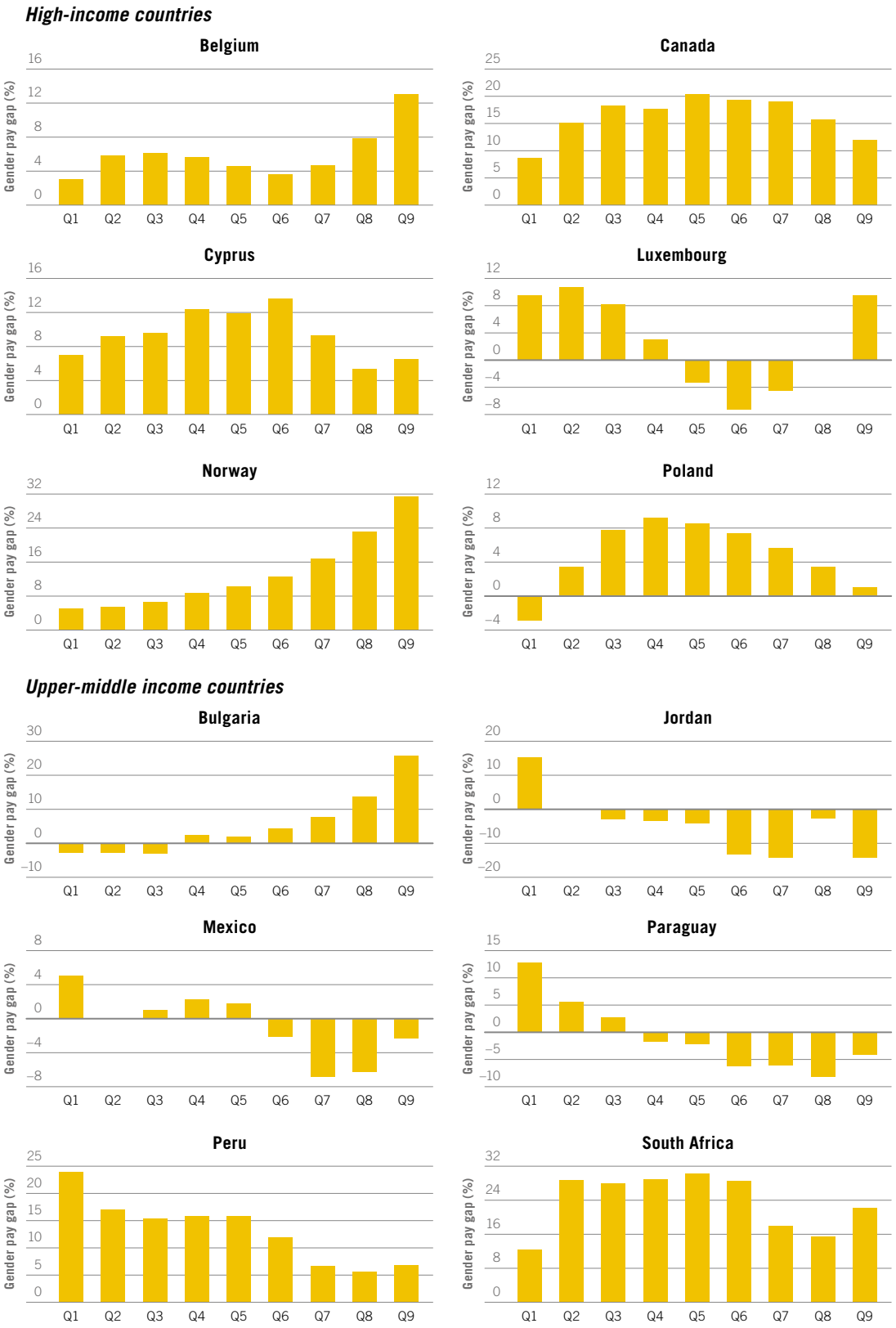
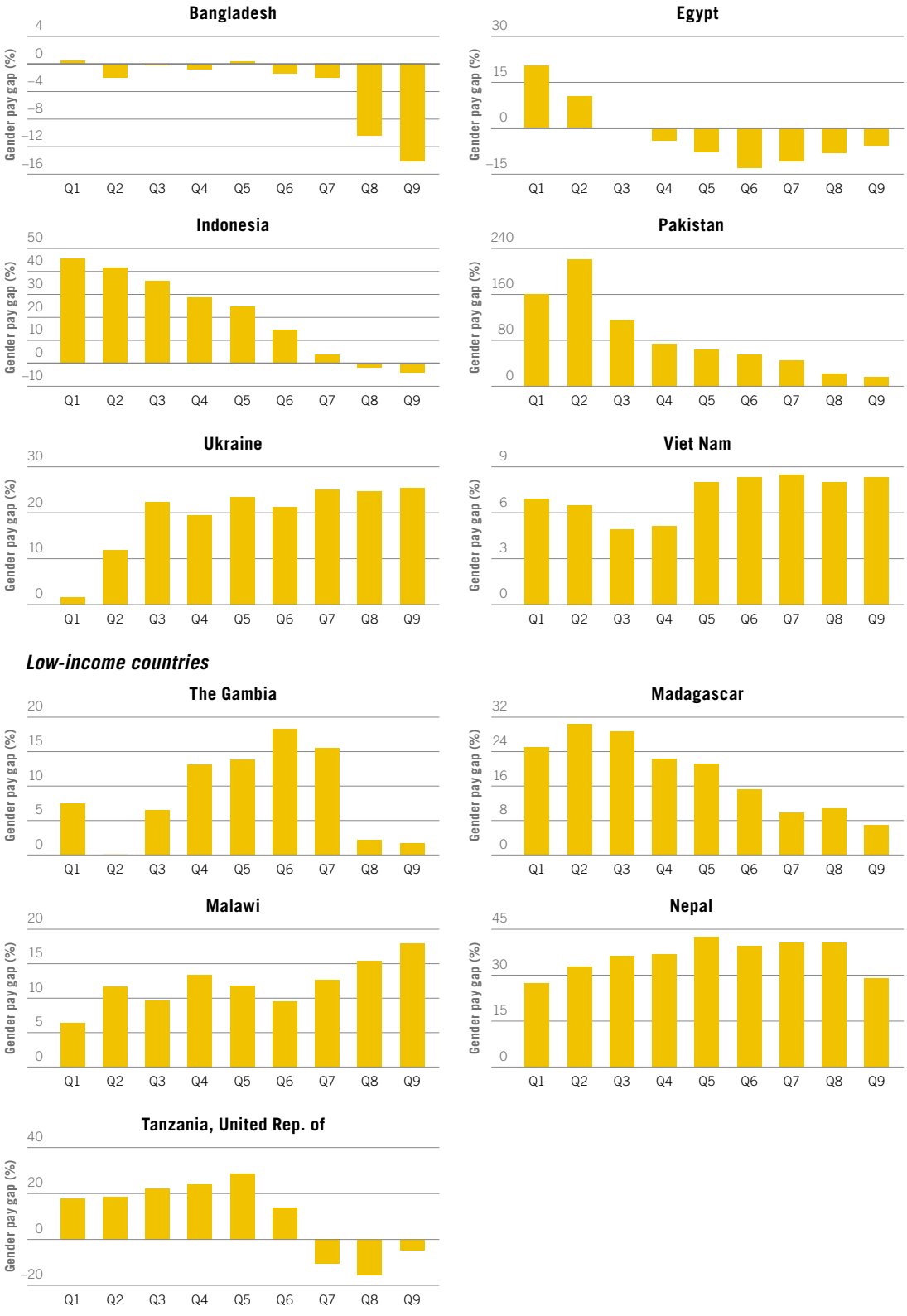


Figure 24 (cont'd)

Lower-middle income countries



Source: ILO estimates showing the difference in logarithms at each quantile (see Appendix V).

There seems to be a tendency for the gender pay gap to increase as we move from lower to higher points in the hourly wage distribution, although this is by no means apparent for all countries. Among high-income countries, the widening of the gender pay gap at the upper end of the distribution is striking: in the case of Belgium, for example, the gender pay gap is about 3 per cent at the bottom quantile but increases to about 13 per cent at the top quantile. In Canada, Cyprus and Poland the widening gap starts to narrow again towards the very top of the range. Interestingly, in the case of Poland there is a negative gender pay gap at the first quantile.

Estimates from other income groups (upper-middle, lower-middle and low income) show somewhat more diversity. In several of the countries illustrated, the irregular shapes can in fact be the result of very small groups of women wage employees in that labour market. When we compare a relatively small number of women to a larger and more diverse group of men, at the same point in the wage distribution, the result can be disproportionately influenced by the presence of very few women at that wage level. This is what is known as the small sample (bias) effect.

Figure 25 shows the respective shares of women and men at different locations of the wage distribution, for the same selection of countries as in figure 24. These charts point towards a common pattern in labour markets across the world: as we move from lower to higher hourly wages the proportion of women declines, in some cases sharply. For example, women make up 50 per cent of the bottom 1 per cent of wage earners in Belgium, but only about 26 per cent of the top 1 per cent; in Pakistan, women account for almost 90 per cent of wage earners in the bottom 1 per cent but just 9 per cent in the top 1 per cent. In Jordan, Bangladesh and Egypt – and to a lesser extent in Mexico, Nepal, The Gambia, South Africa and the United Republic of Tanzania – women are under-represented in all hourly wages. In fact, across the world, a sizeable proportion of women are left out of wage employment. In the case of high-income countries, reduced participation of women in wage employment may be the consequence of motherhood status, whereas in middle- or low-income countries not being in wage employment may also be an indicator of participation in own-account work in the informal economy.

Rather than looking at the different pictures provided by the data for each individual country, it can be more informative to explore patterns that emerge when results are compared for a wide range of countries. Figures 26, 27 and 28 show this for the gender pay gap, and the share of women and men, respectively, at the lower and upper ends of the hourly wage distribution. In figure 26 we observe two things: among high-income countries the gender pay gap is wider at the top than at the bottom. Clearly, although both the "sticky floor" and the "glass ceiling" effects are present in these countries, the glass ceiling effect is far more prominent, even though on average it may affect fewer women, as shown in figures 24 and 25. In contrast, for low- and middle-income countries, figure 26 shows that at the low end of the wage distribution, where women are proportionally over-represented – and, therefore, where the estimates are more likely to be statistically significant – the gender pay gap is wider than it is at the top. It is also interesting to see that the gender pay gap at the bottom of the wage distribution is greater among lower-income countries than among higher-income countries.

Figure 25 Share of women and men by top and bottom centiles and intervening deciles of the hourly wage distribution, selected countries, latest years

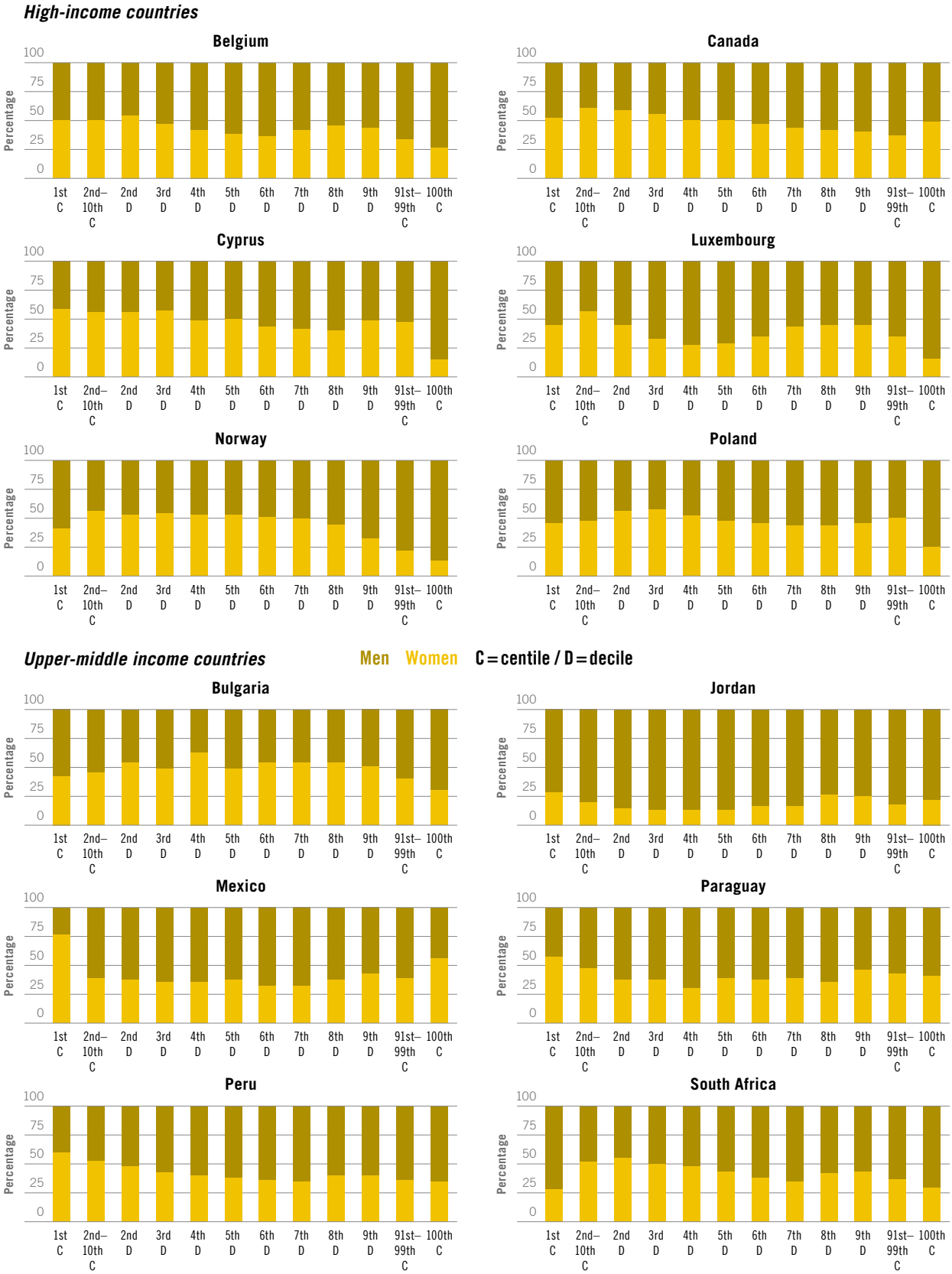
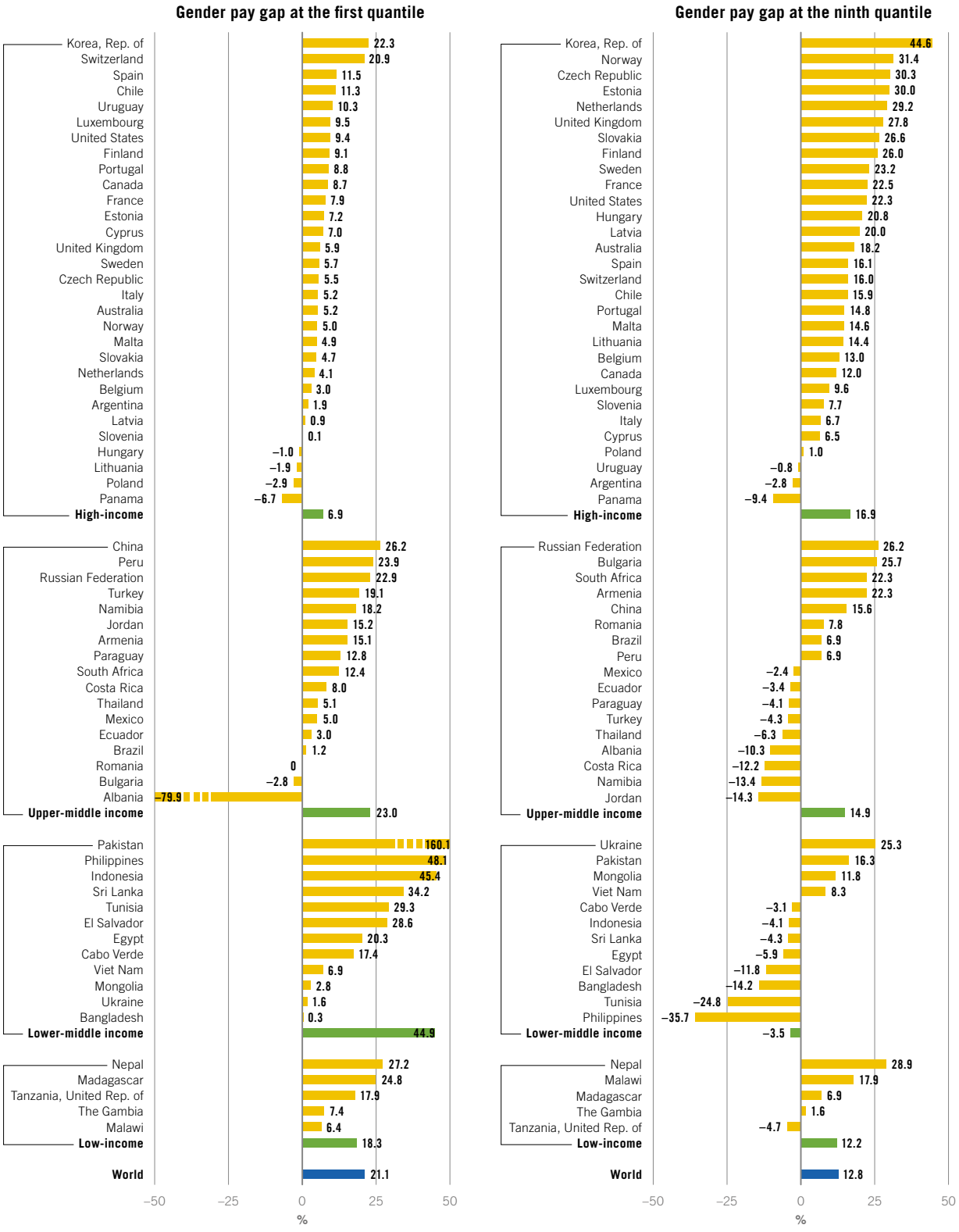


Figure 25 (cont'd)

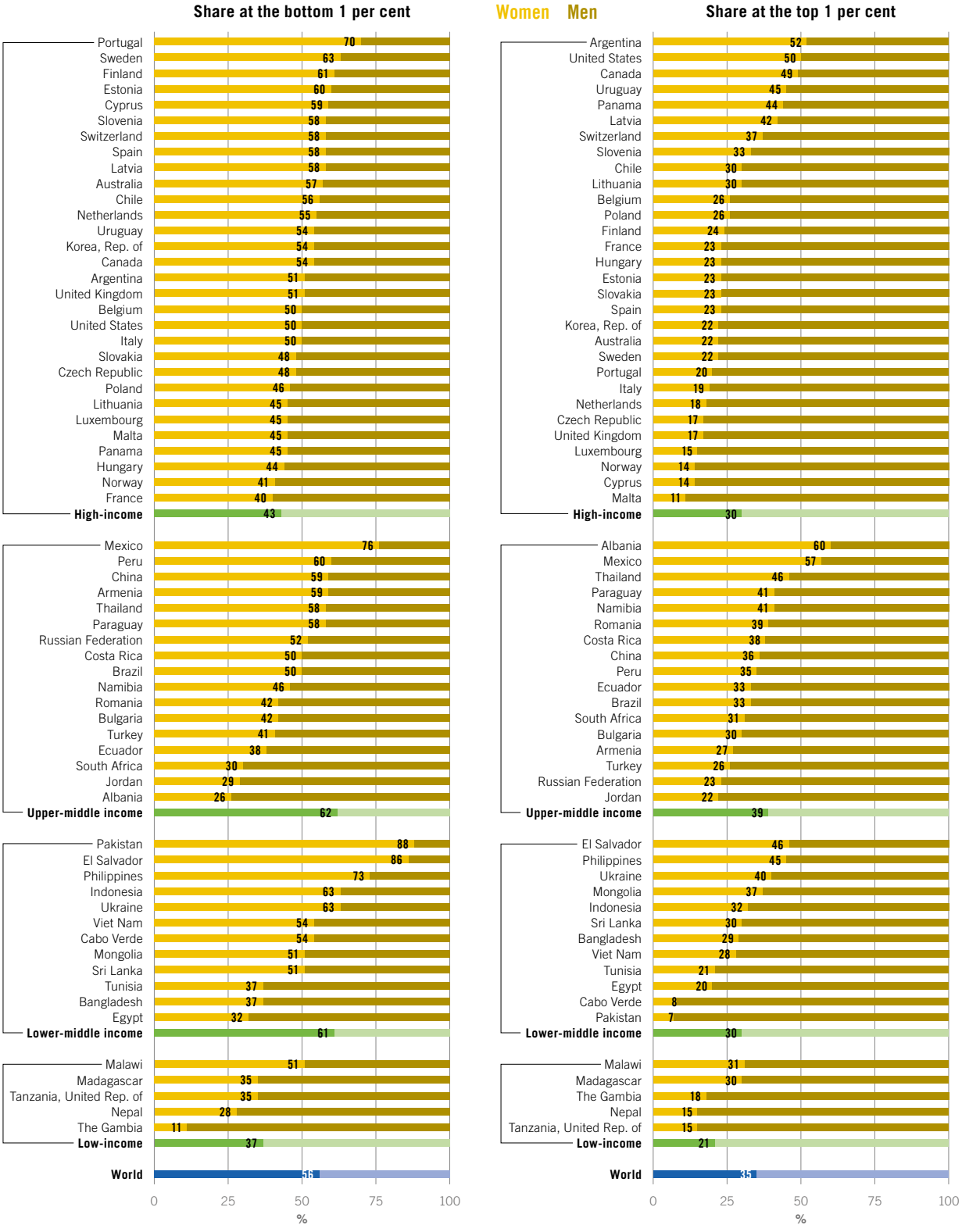
Source: ILO estimates based on survey data provided by national sources (see Appendix V).

Figure 26 Gender pay gap at the first and ninth quantiles in the hourly wage distribution, latest years



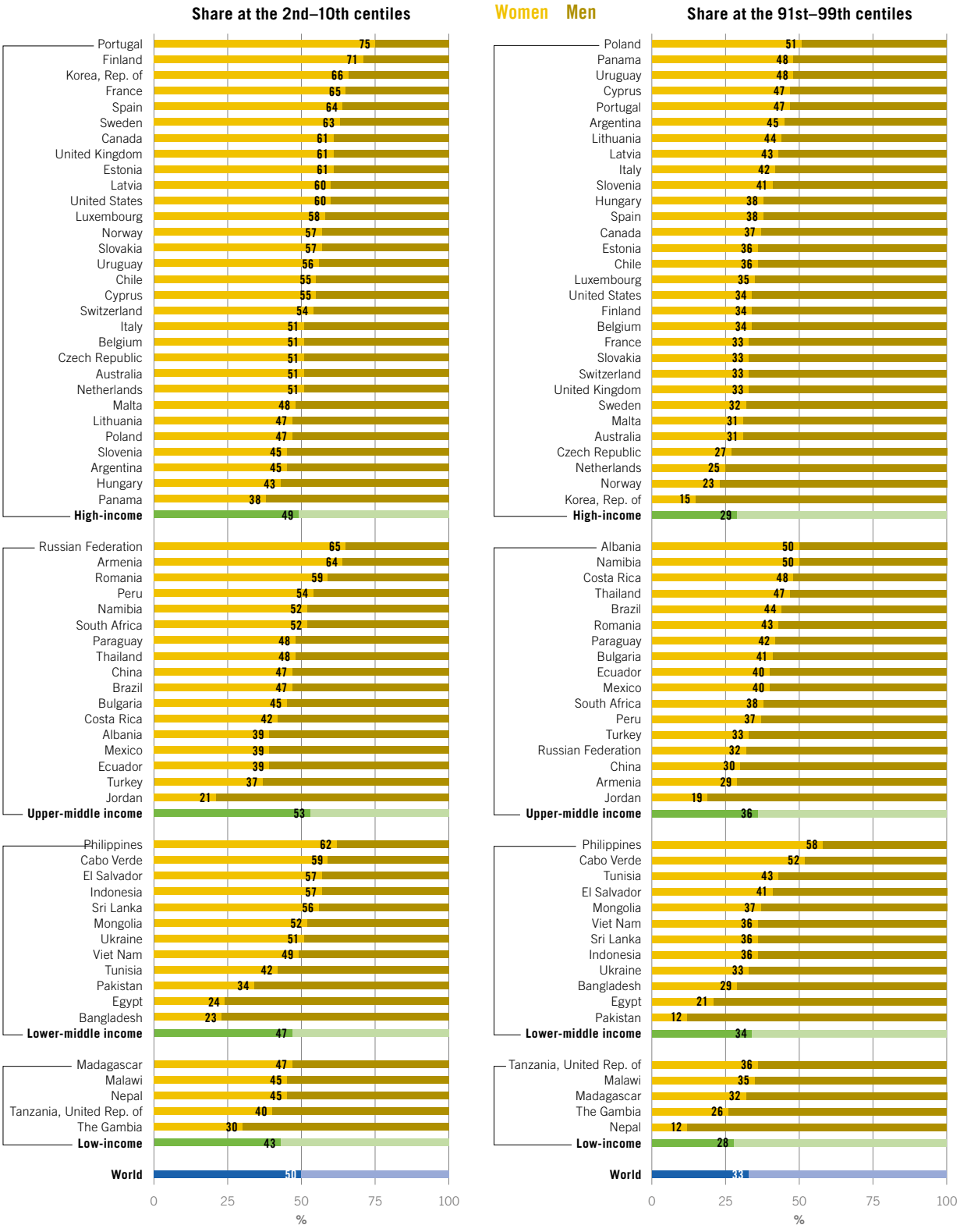
Source: ILO estimates based on survey data provided by national sources (see Appendix V).

Figure 27 Share of women and men at the bottom and top centiles of the hourly wage distribution, latest years



Source: ILO estimates based on survey data provided by national sources (see Appendix V).

Figure 28 Share of women and men at the 2nd–10th centiles and 91st–99th centiles of the hourly wage distribution, latest years



Source: ILO estimates based on survey data provided by national sources (see Appendix V).

In essence, estimating gender pay gaps at different points across the wage distribution is more informative than a single summary measure of the gender pay gap. In particular, when women's participation in wage employment is low – as, for example, in low- and lower-middle income countries such as Egypt, Pakistan and Tunisia, where the participation of women in the labour market overall (as wage employees or in any other type of employment) is 25 per cent or less – a far more reliable estimate is derived when the calculation focuses on that section of the wage distribution where women are concentrated.

9.2 What part of the gender pay gap can be explained by differences in the characteristics of women and men in the labour market?

Decomposing the gender pay gap at different locations in the hourly wage distribution

The next step in our quest to understand the gender pay gap is to decompose gender pay gaps into an "explained" and an "unexplained" part. The explained part refers to the part of the gender pay gap that can be explained by differences in labour market attributes or characteristics (human capital endowments, job characteristics and workplace characteristics), whereas the unexplained part indicates how much of the gender pay gap cannot be explained by differences in those attributes or characteristics.

We use the decomposition techniques proposed by Fortin, Lemieux and Firpo (2011) to decompose the explained part of the gender pay gap and thus isolate it from the unexplained part. These are not the only decomposition techniques available, but thus far they have proved to provide more reliable outcomes than others.[9] In essence, the technique involves three steps. The first step is to select a set of attributes and characteristics that normally explain differences in wages between individuals (see table 9.1). The second step consists in estimating a "counterfactual" distribution of wages for women; this represents the wages that women would have earned had they received the same return for their labour market attributes or characteristics as men. The third step involves using the counterfactual distribution to decompose the gender pay gap between that which can be explained and that which cannot be explained by the attributes and characteristics. Box 4 provides an explanation of how these three steps work in practice, while Appendix VI lays out the methodology in more detail.

9. Other decomposition techniques (e.g. those proposed by Machado and Mata, 2005) would provide similar results but have lost many followers owing to their significant computational requirements and in the light of advances in alternative methods in recent years. Another alternative is propensity score matching (as proposed by Ñopo, 2008), which was used to decompose the gender pay gap in an earlier edition of the *Global Wage Report* (ILO, 2014). One important advantage of using the technique proposed by Fortin, Lemieux and Firpo (2011) is the construction of a counterfactual that considers all women in the sample, whereas in propensity score matching the techniques often rely on the selection of a few women as counterfactuals.

Table 9.1 Labour market endowments, attributes and characteristics for the decomposition of the gender pay gap

Group	Variables	Notes
Endowments	• Age • Education (categories) • Years of experience	• In the case of the SES, years of experience are substituted for "tenure" in current employment. • Countries vary in terms of the number of educational categories, although most will identify four or five (e.g. no education; below primary; lower secondary; high school/vocational; university and above).
Job attributes (or characteristics)	• Working time • Contractual conditions • Occupational categories	• "Working time" can be a continuous variable or a dummy variable to identify full time versus part time (following the international definition given by the OECD). • "Contractual conditions" implies a dummy variable to distinguish between permanent and temporary contracts. • The occupational categories for all countries follow the international classification code ISCO-88 or ISCO-08.
Workplace characteristics	• Industrial category for production (principal economic activity) • Size of the enterprise • Public or private sector • Regional location • Urban versus rural area • Type of collective pay agreement	• The industrial categories for almost all countries follow the industrial classification given by NACE Rev. 4. • The size of the enterprise is usually declared in categories (micro, small, medium and large). • Type of collective pay agreement is an indicator available only for SES countries.
Personal characteristics	• Belongs to a union • Is a migrant (not considering internal migration) • Works as domestic worker • Formal versus informal employment	• These variables – except for "belongs to a union" and "is a migrant" are available for low- and middle-income countries only. The exception is Australia, where the variable "domestic worker" can be identified.

Notes: ISCO = International Standard Classification of Occupations; NACE = Standard Classification of Economic Activities in the European Community, OECD = Organisation for Economic Co-operation and Development; SES = Structure of Earnings Survey. Not all variables are available for all 65 countries in the data set (see Appendix V). Almost all identify the following: age, education, experience, working time, contractual conditions, occupational category, industrial code (principal economic activity) and rural/urban location. Exceptionally, in the case of the United States Current Population Survey, race is also identified, and a dummy for "white" versus all other races is used in the decomposition of the gender pay gap for this country. In countries where the variable "occupational category" included a single category for "domestic worker" the latter was joined with "unskilled" and the dummy for "domestic workers " was included independently.

This decomposition of the gender pay gap offers several benefits. First, identifying the part of the gender pay gap that can be explained by labour market characteristics can help policy-makers in designing policies that target differences in endowments and characteristics between women and men: for example, by reducing differences in educational attainment or by encouraging women and men to diversify across occupations or sectors. Second, if the size of the unexplained component is large, this may suggest that reducing the gender pay gap also requires measures to eliminate pay discrimination and promote legal frameworks and policies conducive to equal pay for work of equal value between women and men.

Box 4 Decomposing the gender pay gap: An illustrative explanation

The decomposition of the gender pay gap consists of three steps. First, a set of attributes or characteristics – that is, observed indicators in survey data – are selected on the basis of their relevance in the wage determination process. Table 9.1 shows the attributes and characteristics selected for the decomposition of the gender pay gap in this report: the selection is based on the availability of these indicators in each of the surveys described in Appendix V. Not all indicators are always available for all countries, and some are exclusive to particular economic contexts (see notes to table 9.1).

In the second step, econometric techniques are applied, using the observed attributes or characteristics, to generate a counterfactual wage distribution which represents the wages that women would have earned had they received the same returns for their attributes and characteristics as men. (The method is described in detail in Appendix VI.) Once the counterfactual distribution is econometrically computed, we have three wage distributions: the wage distribution for men, the wage distribution for women and the counterfactual wage distribution for women. The three distributions can be compared at any of their quantiles, for example at the median. Let us say that at the median the hourly wage for men is 10 coins and that for women is 6 coins: this means that at the median the gender pay gap is 40 per cent. Let us also assume that at the median the counterfactual hourly wage equals 9 coins: this represents the median wage that women would have earned if, for their actual "average" endowments and attributes, they were paid the same as men are paid for their attributes at the median. Here the word "average" is important because it denotes approximately the same endowments, implying that in a comparison of several indicators, women (or men) can have more or less of one or more attributes (for example, more education but fewer years of experience). Going back to the comparison, the distance between what men get (10 coins) and what women would have got given their labour market characteristics had they been men (9 coins) is explained by the difference in attributes. The rest, namely the difference between what women would have got, given their labour market characteristics, had they been men (9 coins) and what they actually get (6 coins) cannot be explained by attributes or endowments. Therefore, the difference between what women should get for their endowments (9 coins) and what they actually get (6 coins) is attributable to the fact that women are getting lower returns from their labour market endowments and characteristics at the median; this difference is called the unexplained or structural part of the gender pay gap.

The construction of the counterfactual helps to identify the fact that women can have a different wage *structure* from men, not because they have different endowments but because they also get different returns from such endowments – hence the word "structural" is sometimes employed to denote the unexplained part of the gender pay gap. In the example, the unexplained part of the gender pay gap is 3 coins. In sum, the hypothetical example illustrates a situation where the total gender pay gap at the median can be decomposed into two parts: the explained part (10 per cent) and the unexplained part (30 per cent).

The third and final step in the decomposition consists in applying a type of regression analysis, known as unconditional quantile regression, to each quantile (for a detailed and very enlightening application of unconditional quantile regression on gender pay gaps, see Chi and Li, 2008). This quantifies how much each of the attributes contributes to each of the two parts of the gap, the explained and the unexplained (for more details on this, see Appendix VI). A positive contribution from a given endowment to the explained part implies that, compared to women, men have more of a particular endowment that is well rewarded at that quantile. For example, on average men may have more education – or the more relevant type of education – than women at that quantile. A negative contribution implies that women have more of such attributes or endowments compared to men (and hence should in principle be better paid than men). →

Box 4 (cont'd)

In our decomposition, the unexplained part is positive when the returns that women should get from their endowments and attributes are higher than what they actually get. Alternatively, it might be that the unexplained part of the gender pay gap is negative. This would reflect a situation where women are getting returns that are above those that they should get on the basis of their labour market endowments and attributes.

Once the decomposition into the explained and the unexplained parts of the gender pay gap has been carried out, the application of the regression analysis leaves behind – at each quantile – two other components of the gender pay gap that need consideration: one is the so-called "residual" or statistical leftover, which should be fairly small if the model specification – in the present case, the indicators selected to interpret wages – is accurate and captures the wage determination process well; the other is a component that gathers together everything that cannot be explained by either women's or men's endowments or characteristics or the returns thereon, at least in so far as these characteristics are observed in the data. In econometrics this is known as the "constant" term and can cover, for example, the effects on wages of general macroeconomic tendencies, seasonal factors such as the weather, and anything else that may affect the wage determination process but is not specific to individuals in the process of production. In theory, the estimate of this "unknown" part, which captures the difference between women and men with respect to labour market trends common to all, should be small; for example, there is no reason why, on average, macroeconomic outcomes, weather forecasts, and so on, should have a different impact on women's and men's wages. At an individual level, the constant can also pick up factors such as the cognitive ability of individuals that may have an impact on their productivity and, therefore, on their wages. But again, the distribution of ability should be identical between women and men in the population, on average.

The constant term can also, however, pick up on differences that are well rooted in society and affect women and men differently, such as gender stereotypes relating to motherhood and fatherhood, the value that society places on certain economic sectors or occupational categories where women and men are clearly polarized, among others. Notwithstanding the difficulties that applied econometrics has in interpreting the difference in the constant term between women and men, we interpret this component of the gender pay gap related to the constant as an element that adds – either positively or negatively – to the unexplained part of the gender pay gap.*

* Although the potential effect resulting from omitted variables is not negligible, the indicators in table 9.1 should in practice provide a fairly complete specification for the data-generating process. What is more of a worry is the fact that many of the variables included in the set are categories, and these categories enter as independent indicators in the regression process. The econometric techniques require that at least one category of each categorical variable is excluded from the regression, thus complying with the usual requirement of exclusion restrictions for identification. Selecting which category to exclude is an arbitrary choice and, depending on this choice, the coefficient associated with the constant term can have one value or another. This limitation at the interpretation of the constant term in the decomposition has been highlighted (see Fortin, Lemieux and Firpo, 2011, pp. 41–44). One solution to this problem is to convert each category into two – for example, instead of having ten categories of industrial sectors and excluding one arbitrarily, to create a binary outcome that sets "trade" against "other sectors", and excludes "other sectors". This controls for some of the effects of arbitrarily excluding a category, but at the expense of weakening the explanatory power of the indicators included in the pursuit of estimating the weights. We have actually proceeded with this as an experiment and have obtained similar results for the total unexplained part of the gender pay gap – albeit with some modifications in the explained part and the residuals, as would be expected. Therefore, we consider that on a qualitative basis the policy conclusions of our analysis would not change significantly if we used different arbitrary exclusions. One way to control for the possible effects on the constant is always to exclude those categories that would apply more to men than to women. Thus, for all countries and all the decompositions we used the following exclusions: older age group; working in the mining/quarrying or construction/utility sectors; CEO or manager as occupational category; working in the private sector; working full time rather than part time; working in larger enterprises; and working with a permanent contract. Since all these exclusions are potentially closer to defining a man rather than a woman in the labour market, the exclusion restrictions are not arbitrarily selected but are related to the condition of being a woman or man in the labour market.

The explained and unexplained parts of the gender pay gap at different locations on the wage distribution: Some country examples

Figure 29 shows the decomposition of the gender pay gap for a selection of countries and at each location on the hourly wage distribution. Each chart shows three components at each quantile, which together represent the explained and unexplained parts of the gap. Among the elements of the explained part we single out "education", so that the second component, labelled "other factors", represents the explained part, minus the specific element "education". The sum of the three parts at each quantile represents the gender pay gap at that quantile. It is worth noting here that some of the countries illustrated in figure 29 also appear in figure 24, so that comparisons can be made.

We see that the relative importance of the explained and unexplained components in different parts of the distribution varies from country to country. Among high-income countries, for example in the United States, the gender pay gap is largely unexplained throughout the wage distribution although education plays its part at explaining the low end. In Cyprus or Hungary, the picture is slightly different: at the bottom of the distribution, the gender pay gap can be explained by differences in attributes and characteristics, but in the upper parts of the distribution it remains unexplained. In some countries, for example in Norway or Spain, it appears that the gender pay gap remains mostly unexplained, especially at the upper end of the wage distribution.

For middle- and low-income countries the picture is even more mixed: while the gender pay gap can be explained by differences in attributes and characteristics in most parts of the wage distribution in countries such as Jordan, Madagascar or Tunisia, it remains mostly unexplained throughout the distribution in China, Pakistan or Viet Nam. In Brazil, the gender pay gap is explained at the bottom and in the middle, whereas in other countries the relative importance of the explained and unexplained parts of the gender pay gap varies from quantile to quantile. As noted above, in middle- and low-income countries the labour force participation of women is lower and they are often located at the low end of the wage distribution (see figure 25), so that estimates for these countries – in particular at the upper quantiles – may be less precise.

What about the role of education? As highlighted in box 4, when the "education" component is positive, this can be either because men have greater educational attainment than women at a given quantile or because, on aggregate, men possess a type of education that pays more at this quantile – even though women may in fact have more years of education. The latter would show that women are "overqualified" at the particular quantile. When the explained component at a quantile is negative on account of education, this may indicate that women are more qualified than men (and that if all other attributes and characteristics were the same women should thus in principle earn higher wages than men at that quantile). In order to better understand this aspect of the decomposition, we look at the example of Cyprus, where women score better than men in education at the low end of the wage distribution. This is confirmed in Appendix VII which shows, for a large number of countries, the educational score of women vis-à-vis the educational score of men, at each quantile.

Figure 29 Decomposition of the gender pay gap, isolating the explanatory effect of education, selected countries, latest years

Figure 29 (cont'd)

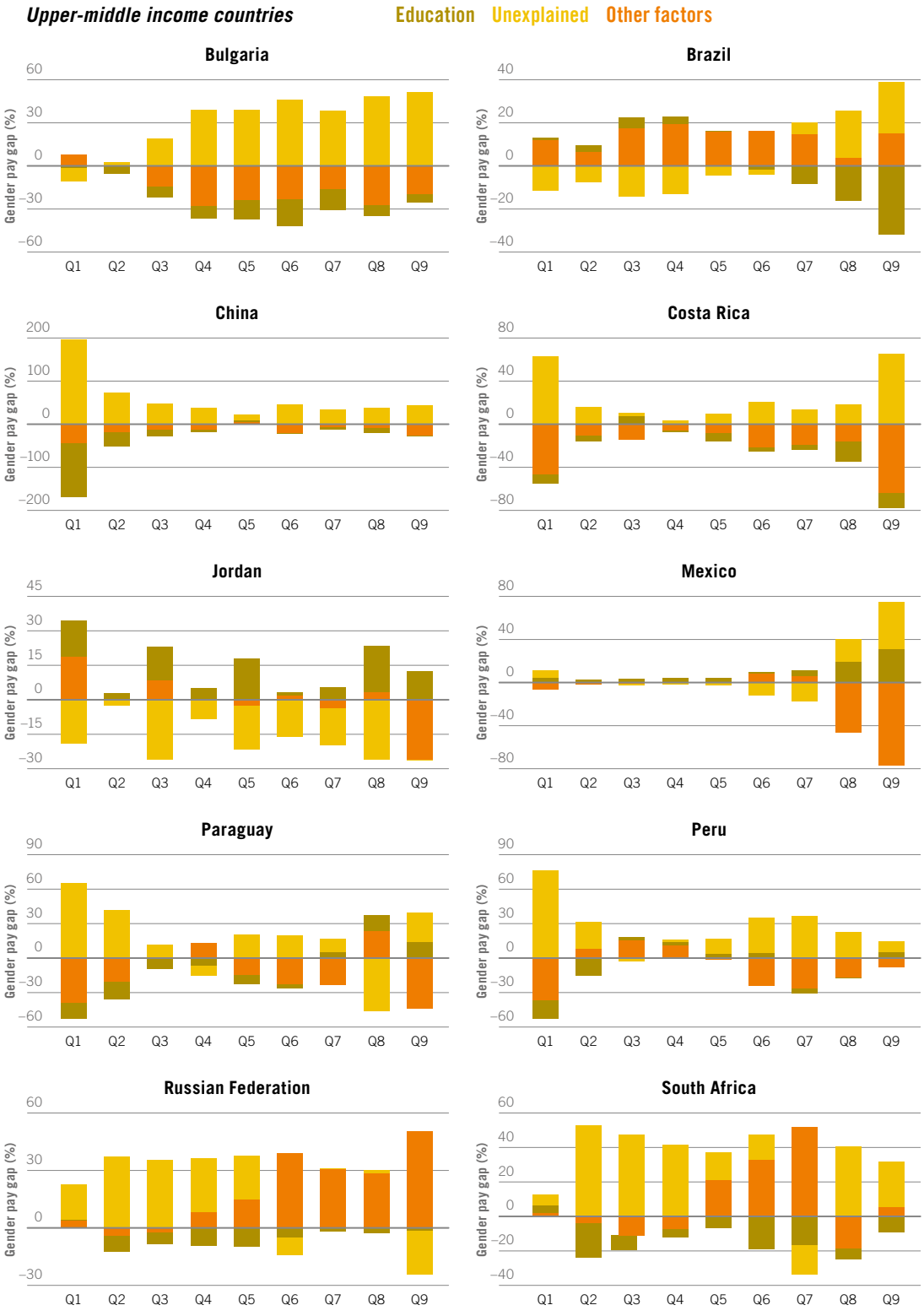
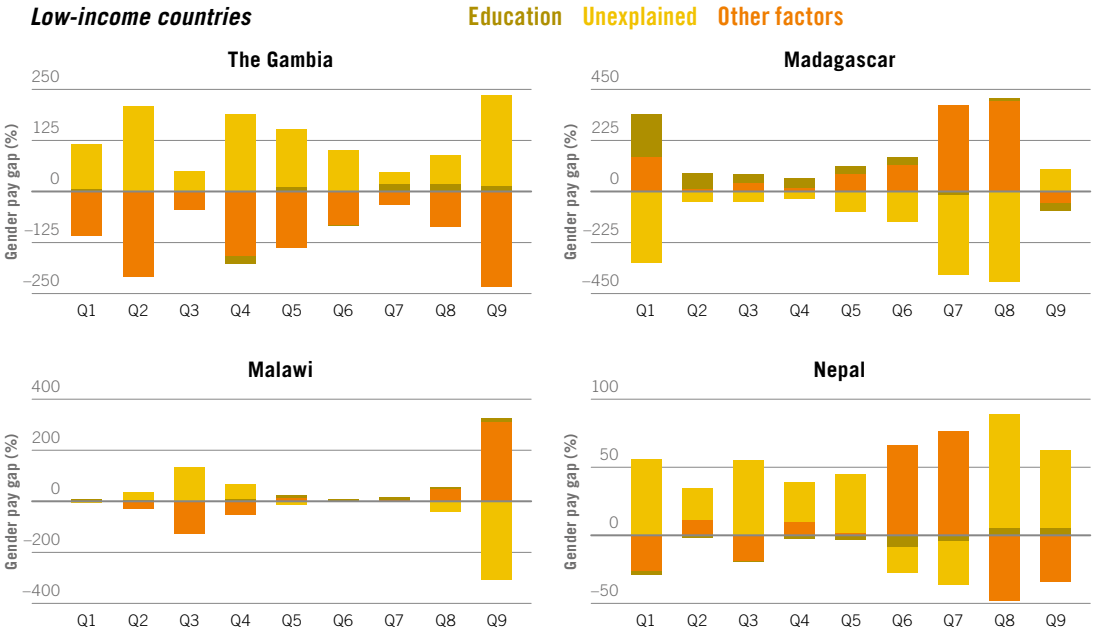


Figure 29 (cont'd)

Figure 29 (cont'd)



Source: ILO estimates based on survey data provided by national sources (see Appendix V).

Hence, if there were no other differences in labour market attributes or characteristics, in Cyprus women would be expected to earn 19 per cent more than men in the bottom quantile of the wage distribution. However, because of differences in other labour market attributes and characteristics, the gender pay gap turns positive in favour of men: this is clearly shown in figure 24, where the gender pay gap for Cyprus at the bottom quantile is 7 per cent.

Overall, in high-income countries and in most quantiles, education explains only a small portion of the gender pay gap. Furthermore, its sign is most frequently negative: when education explains part of the gender pay gap, most of the time it contributes to reduce it rather than to increase it. Even in places where education contributes positively to the gender pay gap this may not necessarily mean that men are more educated than women. The chart for Norway in figure 29 provides an interesting example. Here, at the lower end of the wage distribution, there is a positive gender pay gap which can be partly explained by differences in educational attainment between women and men. This is not because men are more educated than women (Appendix VII shows that in Norway women score higher than men in education at the low end of the wage distribution), but rather because women are "overqualified" when they are found at the low end of the distribution: in other words, they are on average educated to a higher level than that associated with the (qualifications that bring the) highest returns at that quantile. Just to illustrate this point, there may be more women with university degrees at the low end of the wage distribution but more men with vocational training, and it is the latter that is associated with higher returns for education at the low end of

the distribution. This being said, in Hungary and Slovakia men score higher in education than women at the low end of the wage distribution (see Appendix VII) and this explains part of the gender pay gap. In these two countries the estimates serve to indicate a need for some policy action to reduce the gender pay gap by enhancing the education of low-qualified women.

Among middle- and low-income countries, we observe that education is an important determinant of the gender pay gap in Jordan or in the lower half of the distribution in Ukraine. However, here too, education contributes to reducing rather than increasing the gender pay gap (mostly because women score higher than men in education within deciles, as illustrated in Appendix VII) in all or parts of the distribution in countries such as Brazil, Indonesia or South Africa. In The Gambia, Malawi, Nepal or Sri Lanka differences in educational attainment between women and men play almost no role in explaining gender pay gaps within quantiles.

The explained and unexplained parts of the gender pay gap: A comparison across countries

One interesting exercise is to take a weighted average of each of the three components identified in figure 29 across the wage distribution for each country. Figure 30 shows the results, comparing countries by income group.

We see that in all income groups, the gender pay gap remains mostly unexplained by differences in labour market attributes and characteristics between women and men. There are exceptions, of course, as well as country variations. Among high-income countries, differences in attributes and characteristics still have sizeable effects on the gender pay gap in countries such as Chile, Republic of Korea or Slovenia. Among middle- and low-income countries, the same is true of Albania, Brazil, Madagascar, Namibia, Russian Federation, United Republic of Tanzania, Thailand, Tunisia or Turkey. But in most countries, the largest part of the gender pay gap remains unexplained.

In high-income countries, education contributes on average less than 1 percentage point of the gender pay gap, through it contributes much more in some individual countries such as in Chile, the Republic of Korea, Slovakia or the Czech Republic. This general finding is hardly surprising since in high-income countries the educational attainment of women in paid employment is in the vast majority of countries, and across all rankings of the wage distribution, higher than the educational attainment of men, as shown in Appendix VII; lower educational attainment thus cannot be an explanation for the gender pay gap. More surprisingly perhaps, lower educational attainment is also not so much of a factor in explaining the gender pay gap in a majority of low- and middle-income countries. This may initially seem surprising, because women have generally lower educational attainments than men in many of these countries. In practice, however, a large share of low-educated women stay out of the labour market or work as own-account workers rather than paid employees. If anything, women in paid employment tend to be more educated than men within similar occupational groups (see Appendix VII).

Figure 30 Weighted average of the three components of the gender pay gap shown in figure 29, latest years

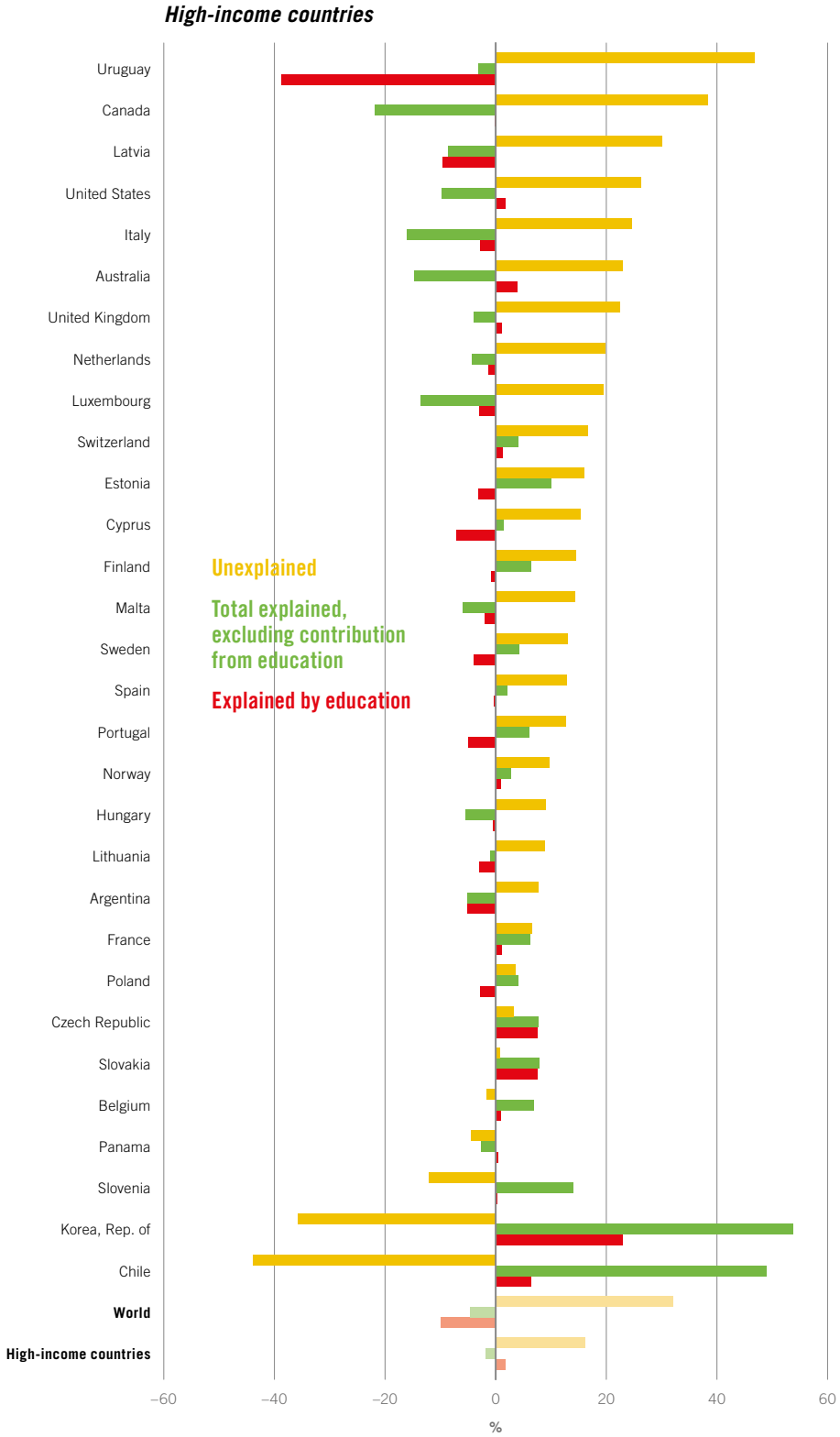


Figure 30 (cont'd)

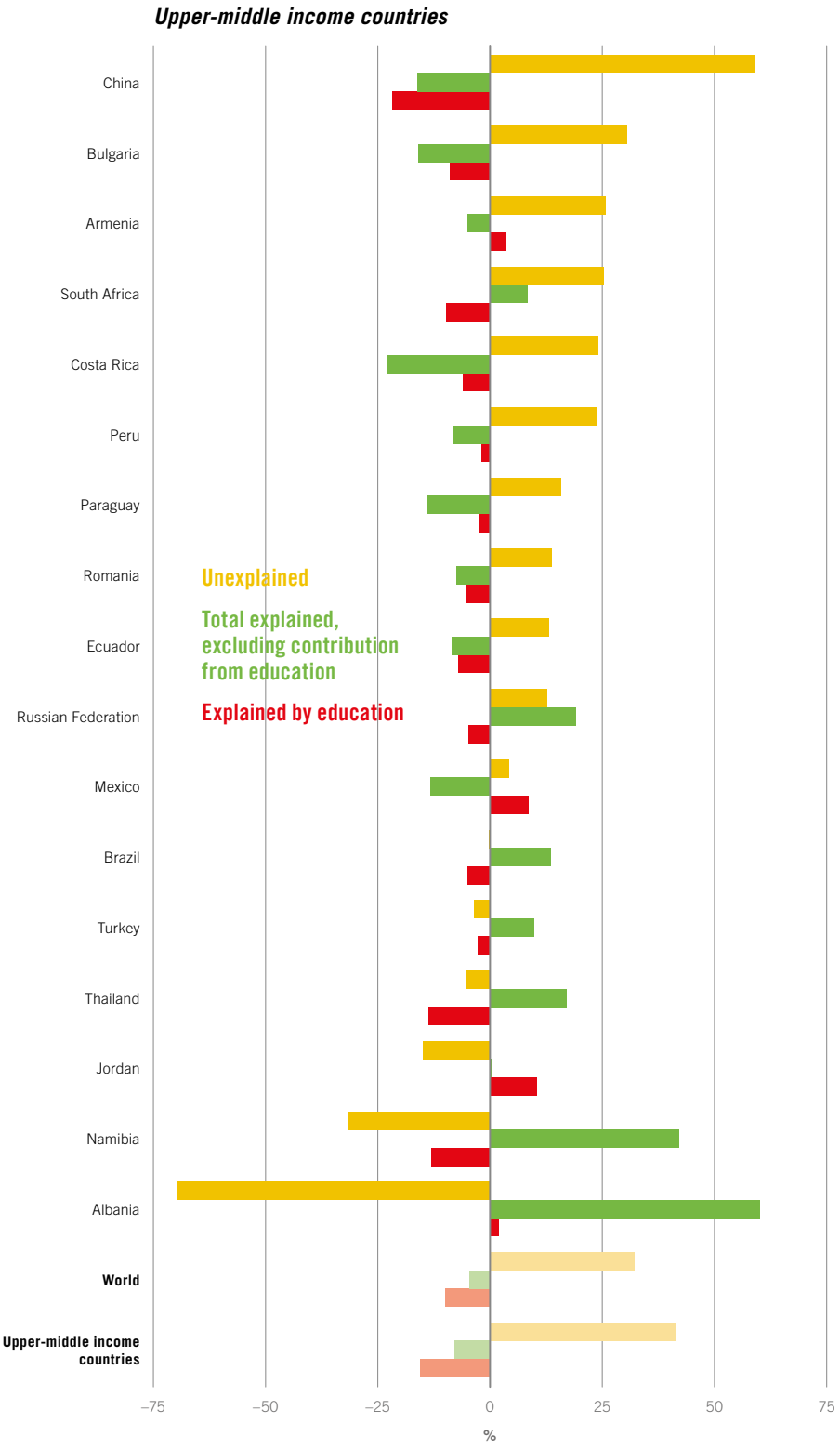
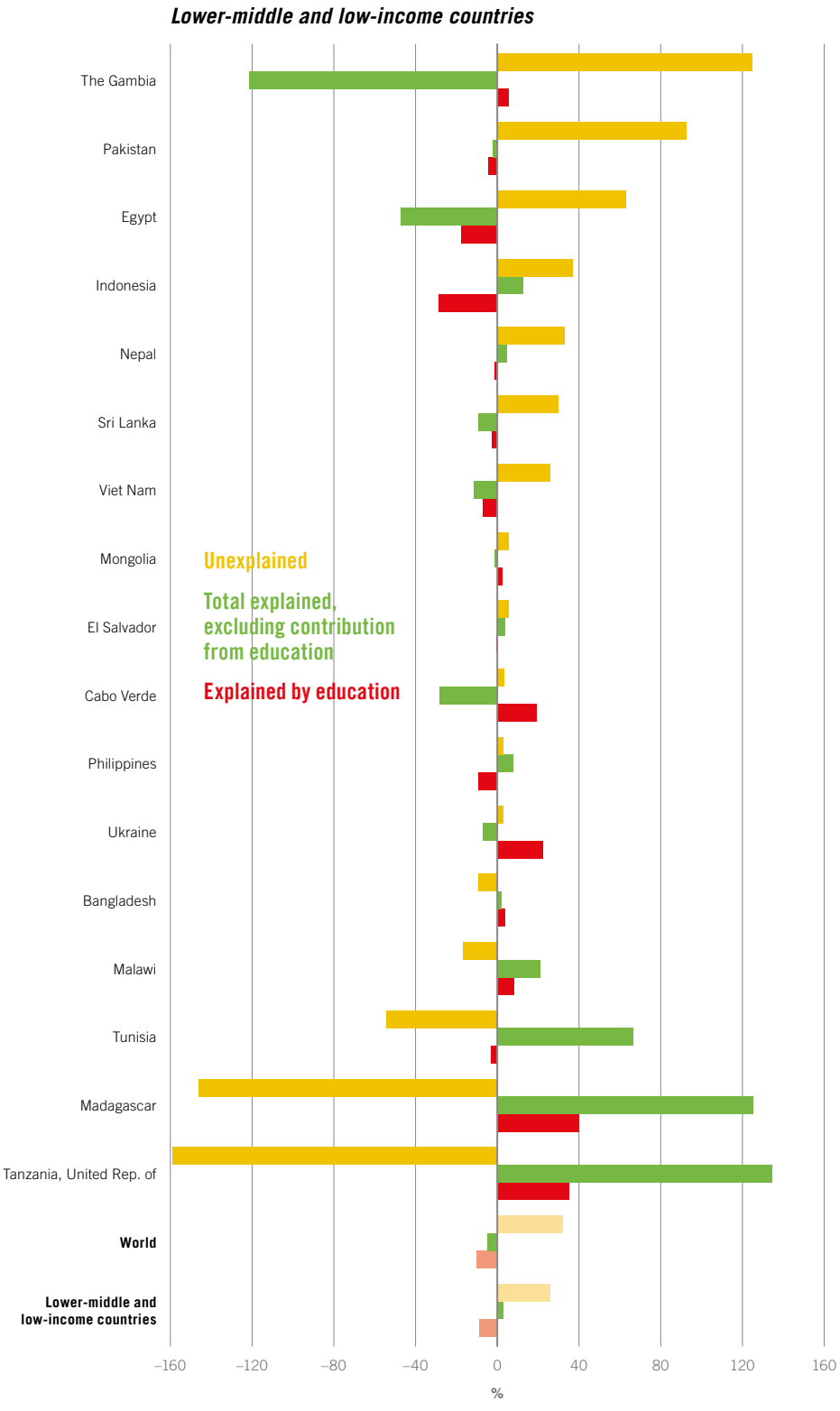


Figure 30 (cont'd)



Source: ILO estimates based on survey data provided by national sources (see Appendix V).

9.3 Understanding what lies behind the unexplained part of the gender pay gap: The undervaluation of women's work and the motherhood pay gap

What lies behind the unexplained part of the gender pay gap? We turn to the question of whether women obtain lower returns for educational attainment than men within the same occupation and whether wages are generally lower in highly feminized occupations and enterprises. Finally, we highlight the issue of the wage penalty for women who are mothers and the possible existence of a premium for men who are fathers.

The wages of women and men in the same occupation

The decomposition in figure 29 shows that much of the gap in earnings remains unexplained. Could it be that women tend to have lower wage returns for their education than men, even when they work in the same occupation? Figure 31 begins to explore this question by comparing the proportion of women and men within each of the occupational categories.[10] The charts show that the share of women in the lower occupational categories (unskilled, low-skilled or semi-skilled) is almost everywhere much higher than the share of women in the top occupational categories (CEOs and corporate managers). For example, in Finland, only 20 per cent of CEOs are women, whereas about 70 per cent of semi-skilled jobs are occupied by women. This illustrates "vertical occupational segregation" – that is, the clustering of men at the top of occupational hierarchies and of women at the bottom. These differences in occupations between women and men are part of the explained component of the gender pay gap (see table 9.1).

However, the same figure shows that within occupational categories and in almost all countries – in fact, in all but nine of the 64 countries for which we have data – women score just as high or higher in education than men, the line showing the "Score in education" for women being nearly always above the line for men; we note that these results are consistent with the estimates in Appendix VII, where the same scores in education are shown but where women and men were compared within an earnings decile rather than within occupational categories.[11] Therefore,

10. All 64 databases used in this report include a classification of occupations in accordance with the International Standard Classification of Occupations (ISCO), based on either the 1988 classification (ISCO-88) or its 2008 update (ISCO-08). The original classification separates individuals into several minor and major groups. The data sets provided for analysis further aggregated the two-digit classification (i.e. the ten major groups) into a smaller number of groups (five to eight). In general, the following can be distinguished: managerial positions, professional jobs, technical jobs, semi-skilled occupations and unskilled occupations; in some instances, the disaggregation allows for the independent identification of the group "domestic workers". For detailed information on the ISCO classification, see: http://www.ilo.org/public/english/bureau/stat/isco/isco08/.

11. The education scores displayed in figure 31 are derived in the same way as those used to compare women's and men's educational attainments in Appendix VII. The data do not provide the "years of education" achieved by each individual, which would have been ideal for this exercise. Instead, we use a category that defines the educational achievement of individuals in categories: this can be "no formal education", "primary", "some secondary", "completed secondary with or without vocational training" or "university studies". To each of these categories we assign a number that explains the relative value

on average, it seems that women's educational attainment is better than or equal to men's within each occupational class. Despite this, the charts also show that for almost all occupational categories and in almost all countries, the gender pay gap remains positive and sizeable. This shows that within occupational categories women have lower returns from education than men. This may be the result of a range of factors, from pay discrimination at the workplace to "horizontal segregation", whereby at the same occupational level (that is, within occupational classes or even occupations themselves) women and men have different job tasks.

Wages in highly feminized occupations

Another issue relates to the possible undervaluation of women's work in highly feminized occupations. Some of the 64 countries in our database allow for a more refined breakdown of occupational categories: these include for example the European economies,[12] Canada, Pakistan and the United States. The number of subcategories of occupation used varies from 42 in the case of Pakistan to 452 in the United States. Thus, for each of these countries we estimate the share of women working in each of these occupational categories (the degree of feminization) so as to organize occupations in relation to their degree of feminization. Having organized occupational categories in ascending order of feminization, we estimate the average hourly wage paid and by educational category within occupation.

Figure 32 displays the results of this analysis for the European countries (taken together) and for the other countries mentioned above. The estimates show that higher educational categories pay higher wages; however, for the same educational attainment, work in occupations that have higher degrees of feminization pay less. For example, in the case of the United States, a university graduate working in a male-dominated occupation where men account for around 95 per cent of workers, will earn US$30 per hour; however, if she or he works in a female-dominated occupation, the average wage drops to about US$20 per hour. The difference in pay is smaller but also real for workers in the United States whose educational attainments are below high school, ranging from about US$15 per hour in a male-dominated category to about US$10 per hour in a female-dominated category.

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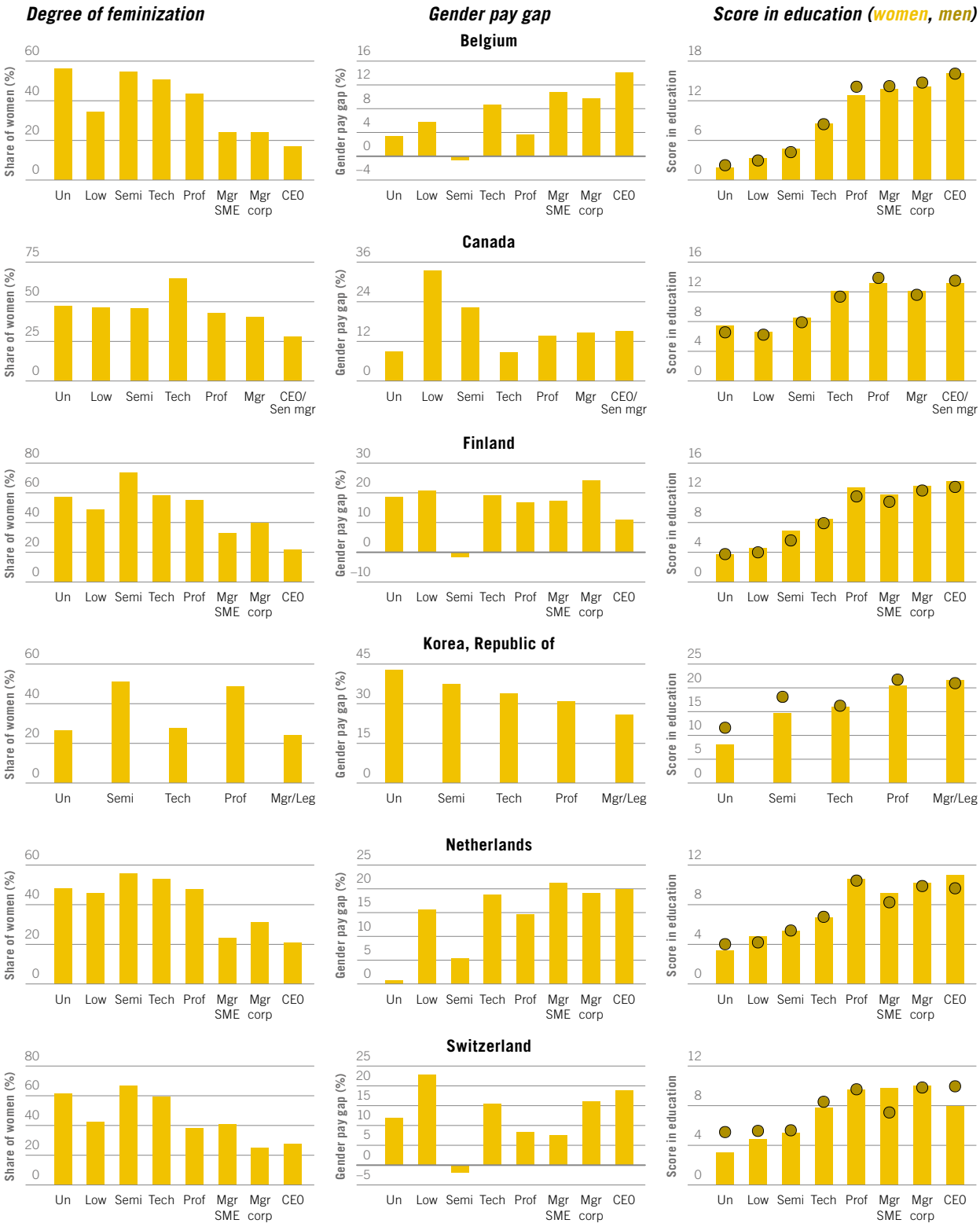
of the individual's education. The lowest category scores 1, and the following categories score higher values that increase exponentially. This exponential growth implies that higher levels of education are valued at progressively higher rates than lower educational attainments. Then, for each of the occupational categories, we take the average of these scores for women and for men. The charts in the third column in figure 31 show these estimates.

12. The data set provided to the ILO by Eurostat is the Structure of Earnings Survey (SES) 2014, which covers the following 23 European countries: Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, France, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. All in all, the data set includes about 10 million observations (for October 2014) distributed across half a million enterprises. The data are representative of wage employees in Europe excluding enterprises with nine or fewer wage employees (micro-enterprises). Enterprises that serve the public sector (public administration) are included, as well as enterprises that are supported by public-sector capital. Together, the 10 million individuals covered represent a population of around 111 million workers in Europe. See Appendix V for more details.

Figure 31 Occupations, feminization, education and the gender pay gap, selected countries, latest years

High-income countries



Note: CEO = chief executive officer; Mgr = manager; Mgr corp = manager, corporate enterprise; Mgr SME = manager, small or micro-enterprise; Sen mgr = senior manager; Leg = legislator; Prof = professional; High prof, Top prof = senior professional; Mid prof = middle professional; Tech = technical; Top-high = upper-high-skilled; Low-high = lower-high-skilled; Semi = semi-skilled; Low = low-skilled; Un = unskilled; Dom = domestic worker.

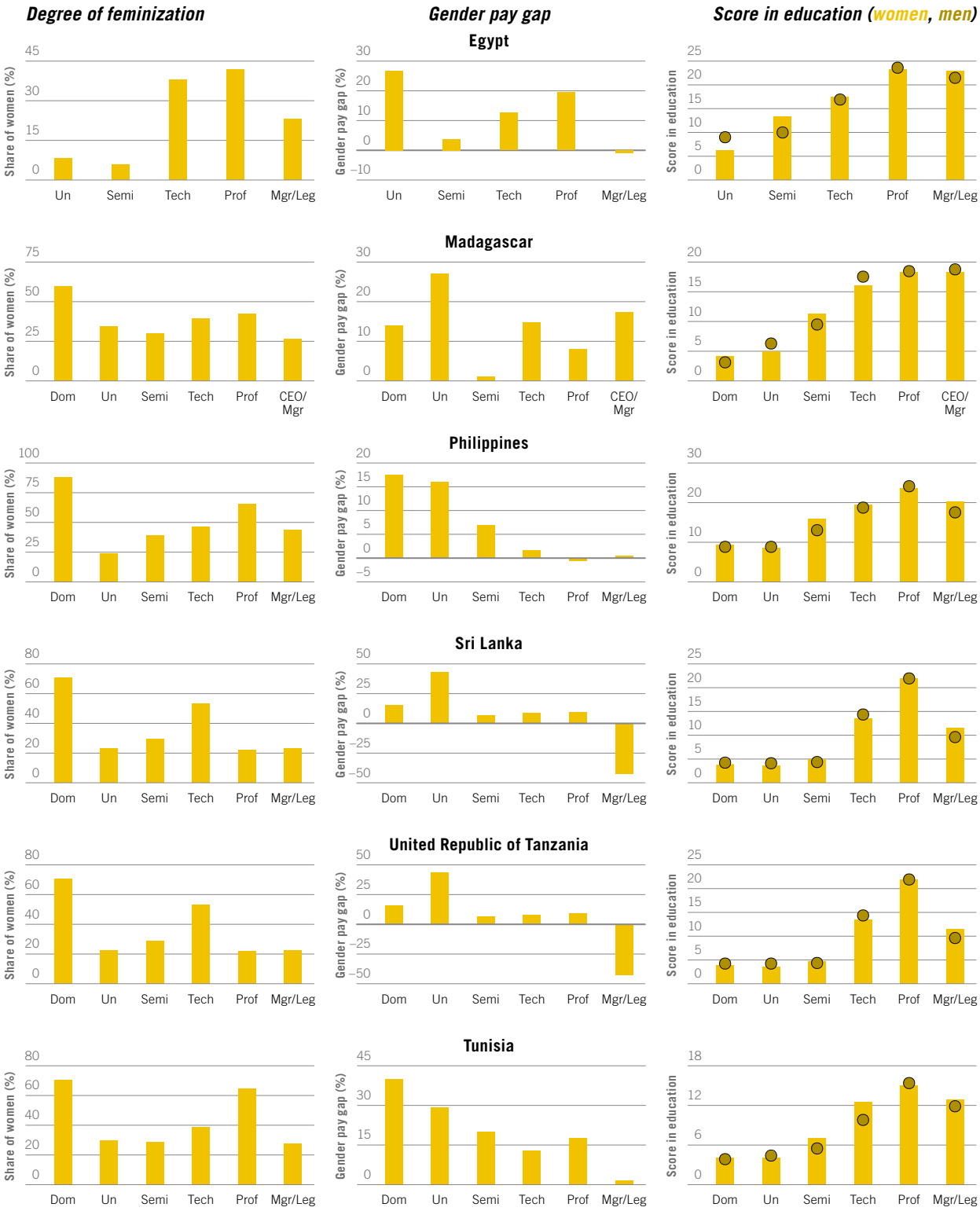
Figure 31 (cont'd)

Upper-middle income countries

Note: CEO = chief executive officer; Mgr = manager; Mgr corp = manager, corporate enterprise; Mgr SME = manager, small or micro-enterprise; Sen mgr = senior manager; Leg = legislator; Prof = professional; High prof, Top prof = senior professional; Mid prof = middle professional; Tech = technical; Top-high = upper-high-skilled; Low-high = lower-high-skilled; Semi = semi-skilled; Low = low-skilled; Un = unskilled; Dom = domestic worker.

Figure 31 (cont'd)

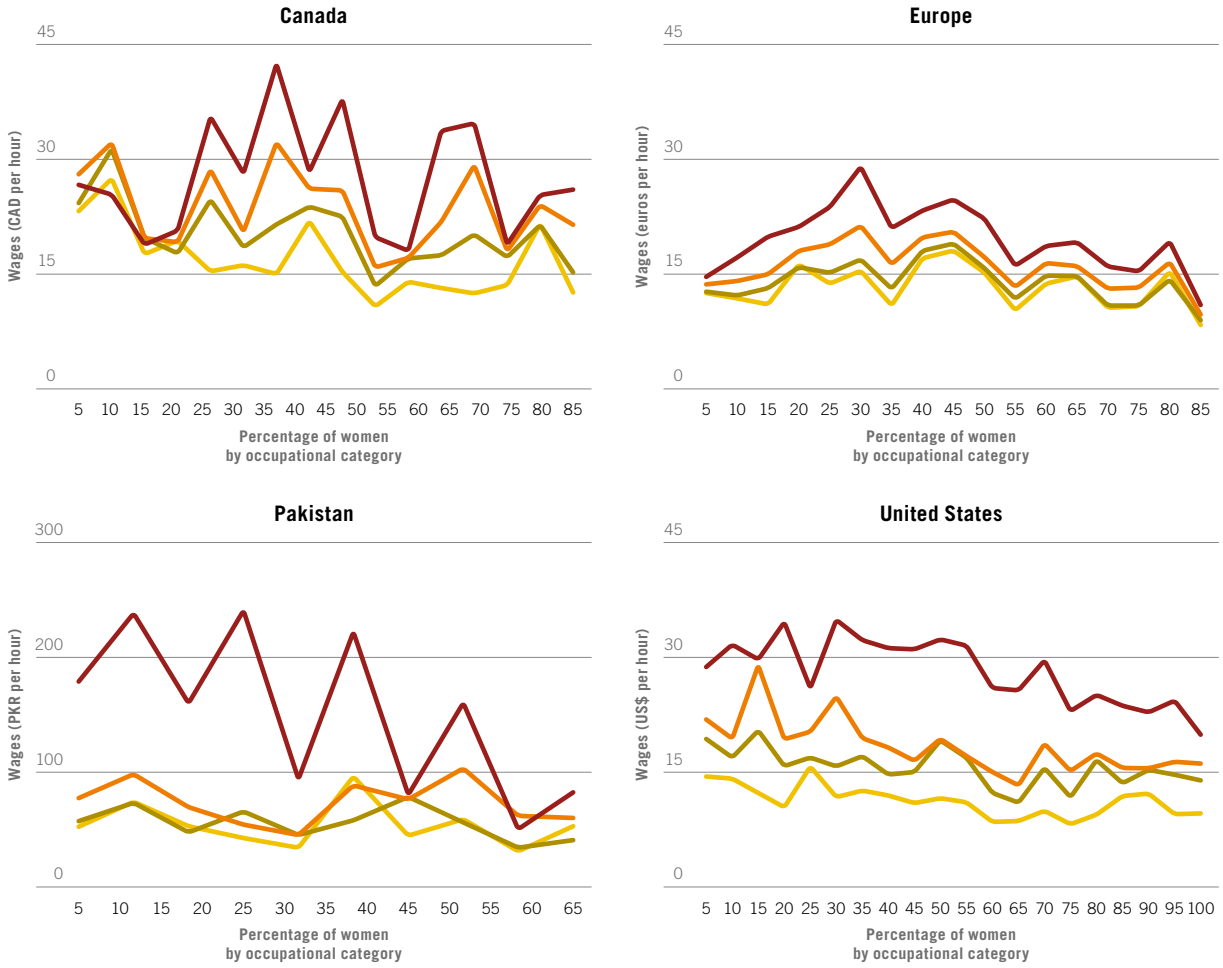
Lower-middle and low-income countries



Note: CEO = chief executive officer; Mgr = manager; Mgr corp = manager, corporate enterprise; Mgr SME = manager, small or micro-enterprise; Sen mgr = senior manager; Leg = legislator; Prof = professional; High prof, Top prof = senior professional; Mid prof = middle professional; Tech = technical; Top-high = upper-high-skilled; Low-high = lower-high-skilled; Semi = semi-skilled; Low = low-skilled; Un = unskilled; Dom = domestic worker.

Source: ILO estimates based on survey data provided by national sources (see Appendix V).

Figure 32 Wages and occupation by degree of feminization



Notes: There are 23 countries included in the calculations for Europe and these are the countries for which SES data have been supplied. For these 23 countries, as well as for Canada, the United States and Pakistan, the data provide occupational category disaggregated into 50 or more categories using the International Standard Classification of Occupations (ISCO-88 or ISCO-08). The horizontal axis in each of the four charts shows the ranking of these classifications according to their degree of feminization (that is, the proportion of women vis-à-vis men in each of these categories). In the case of Europe and Canada, the number of occupational categories with 85 per cent or more women wage employees in them are very few (or none), therefore the estimates are only presented up to the point where the mass of categories to represent the degree of feminization is non-negligent. In the case of Pakistan, this occurs at an earlier percentage point; no occupational categories are detected with 65 per cent or more women wage employees in them. In the case of Europe, the estimates are first produced for each country separately and then these are aggregated considering the weight that each country has in Europe. CAD = Canadian dollars; PKR = Pakistani rupees.

Source: ILO estimates based on survey data provided by national sources (see Appendix V).

Box 5 Empirical evidence of the gender pay gap at enterprise level

Empirical evidence of the gender pay gap at enterprise level is increasing but remains relatively scarce. Two examples (Hedija and Musil, 2011; Jurajda and Terrell, 2003) are both based on data from the Czech Republic; other studies look at the behaviour of employers, who can be thought of as a proxy for the enterprise (see, for example, Neumark, 1988, for the United States). There is, however, a body of empirical studies exploring the gender pay gap using individual-level data but aggregating them by economic sector, enterprise size or occupational category. This literature, although it does not use enterprise-level data, provides an insight into the importance of firms' characteristics in shaping the gender pay gap in the population. In particular, the foundation for most of these studies is a pattern evident across labour markets throughout the world, namely the observed gender polarization (segregation) by industries and occupational categories. Thus, most of these studies observe that pay in female-dominated occupations (vertical segregation) remains lower than in male-dominated ones; likewise, pay in female-dominated industries (horizontal segregation) remains lower than in male-dominated ones (see, among others, England et al., 1994; Blau and Kahn, 2003; Grimshaw and Rubery, 2002; Lips, 2012; Ochsenfeld, 2014). A recent study (Brynin and Perales, 2016) shows that the wage effects of *occupational feminization* are declining, but only among jobs requiring high-level skills in industries hitherto dominated by women where demand for skills is rising (for example, the service sector), although the increasing complexity of the wage determination process in the labour market also plays a role. However, the same study points out that segregation continues to depress pay substantially for women in occupations requiring lower-level skills.

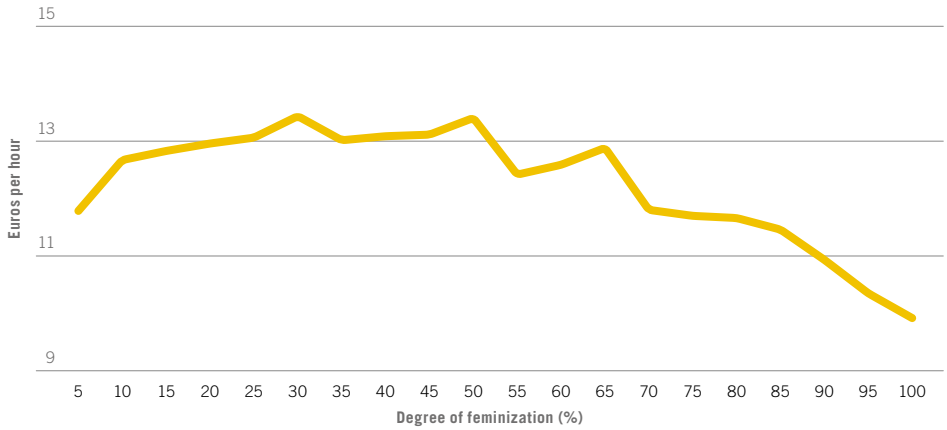
Wages in highly feminized enterprises

All of the estimates of the gender pay gap discussed so far examine the phenomenon as one that applies to individuals in the population, ignoring the significant role that can be played by certain aspects of the enterprise where those individuals work – the workplace – in determining pay differentials between women and men. In the rest of this subsection we therefore provide estimates that show the effect that feminization at enterprise level can have on the gender pay gap. This helps to fill in some of the gaps in knowledge on the subject (see box 5).

In order to carry out this exercise, we need enterprise-level data of a particular nature; indeed, the characteristics of the wage distribution within enterprises can only be studied if we have data that represent all wage employees at each of the enterprises included in a database. Likewise, to understand the difference in wages between enterprises we need – for a given country – data from a representative sample of enterprises (not just from one enterprise, for example). This type of data is what is known as "employee–employer match" (EEM) data. In our case, EEM data have already been used to classify the degree of feminization within occupations for European countries in the previous subsection. In what follows we exploit the characteristics of this type of data for the same set of countries.[13] Each employee in the data is matched to her or his employer, so that the data set provides information about her or his human capital endowments and job characteristics as well as about her or his workplace and co-workers.

13. For the full list of countries, see footnote 12 above.

Figure 33 Hourly wage by degree of feminization in Europe, 2014



Note: The estimates are based on the weighted values of the degree of feminization; the weights reflect the relative size of each country and are provided by Eurostat in the database. For additional information on the data, see Appendix V.

Source: ILO estimates using the 23 countries included in the SES, 2014 (for the full list, see footnote 12 above).

The question we seek to answer is: what is the effect of the degree of feminization at the enterprise level (i.e. the proportion of women as a share of all employees) on average wages in these enterprises? Figure 33 examines and compares the average hourly wage of enterprises for all 23 countries in the SES database, organized in ascending degree of feminization. First of all, we estimated the proportion of women working in each of the approximately half a million enterprises included in the data. Second, working country by country, we ranked the enterprises from those with the lowest degree of feminization (i.e. where most workers are men) to those with the highest degree of feminization (i.e. where almost all workers are women). The horizontal axis displays this ranking from 0, indicating a very low or negligible degree of feminization, to 100, representing enterprises entirely staffed by women. Having organized enterprises according to their degree of feminization, we estimated the average wage paid among the enterprises included.[14] The vertical axis shows the average hourly wage in euros.

Figure 33 illustrates the fact that the higher the degree of feminization in a workplace, the lower the average wage per hour paid in that enterprise. In fact, at the very low end – in male-dominated enterprises where at most 5 per cent of the workforce are women – the average hourly wage is about €12 per hour. This increases rapidly to about €13.5 per hour among enterprises with a moderate degree of feminization, where women make up 30–45 per cent of the workforce. But for

14. Having done this for each of the 23 countries covered, we calculated the average of these 23 values for each of the "bins" (where a bin reflects five centiles of the 100 centiles in the distribution), weighted according to the proportional representation of each of the 23 countries in Europe, so that a large country such as France weighs more heavily in the final computation than a smaller country, such as Malta. We do not consider purchasing power parity because our interest is not in comparing living standards between countries, but simply in comparing the relative difference in wages by degree of feminization using a representative sample of enterprises in Europe.

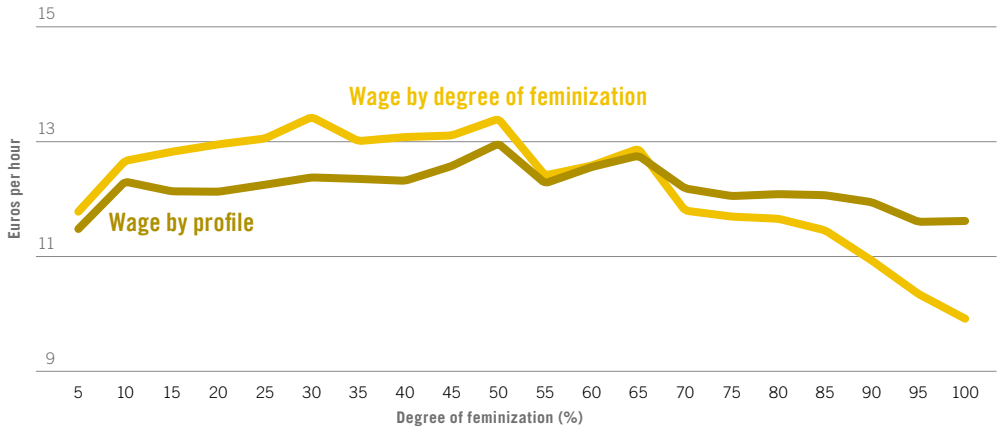
enterprises where the proportion of women wage employees exceeds 65 per cent, the hourly wage paid at enterprise level starts to decline, and at the top end of the "feminization" spectrum, among enterprises staffed almost entirely by women, the average wage is slightly below €10 per hour.

What are the underlying reasons for what seems to be an inverse relation between wages and feminization? It could be that average labour productivity is higher among male-dominated enterprises and lower in female-dominated ones simply because of the characteristics of the enterprise. The SES does not provide information from the revenue side of the enterprise, so it is not possible to estimate labour productivity through value added per worker, and compare these values to the average wage paid at each of the enterprises in the data. However, the SES does provide some indicators that are related to the productivity of the enterprise, specifically the variables "economic sector in production" and "size of the enterprise". In a given country, and controlling for regional variation, enterprises that share the same profile are more likely to be similar in their average labour productivity than enterprises with a different profile, for instance those that are smaller in size and belong to a sector with lower average value added. In addition, we also use information on "public or private financial control" and "type of collective pay agreement" as indicators to profile and compare enterprises. An example of a profile could thus be the following: an enterprise that belongs to the financial sector, is of medium size, is financed in full by private capital and has no collective pay agreements.

Once the enterprises are profiled, each one can be compared to other enterprises in the data set with similar profiles. Figure 34 shows the same wage profiles of enterprises as in figure 33, ranked by degree of feminization, but also plots, for each of the 20 bins, the estimated average hourly wage of all enterprises that share the same profiles – except for their degree of feminization.[15] Looking at the right-hand side of the chart, we can observe that the average wages of highly feminized enterprises (those with 65 per cent or more women) are substantially lower than the average wages of otherwise similar enterprises. At the extreme right-hand side of the chart, female-dominated enterprises (where over 95 per cent of workers are women) pay around €9.90 per hour, in contrast to the €11.60 per hour paid by enterprises with a similar workplace profile but independent of the degree of feminization. This is a gap of 14.7 per cent, which for a worker on a full-time contract would translate into a difference of about €3,500 per year in gross earnings. Conversely, the left-hand side of the chart shows that in enterprises where a high proportion of workers are men (enterprises where women

15. Whereas figure 33 considers the degree of feminization of enterprises, the estimates in the additional plotted points in figure 34 ("wage by profile") consider only the similarity in profiles within each bin, irrespective of how high or low is the proportion of women working in these enterprises. Moreover, the average wage estimated in the additional plotted points excludes all enterprises that are included in that bin as a result of their degree of feminization; in this sense, this shows the average wage in enterprises that share the profile of those in the same bin, but independently of the degree of feminization. Thus, the plot in figure 34 labelled "wage by profile" acts as counterfactual to the plot in figure 33 labelled "degree of feminization".

Figure 34 Hourly wage by degree of feminization and by wage profile in Europe, 2014



Note: The estimates are based on the weighted values of the degree of feminization; the weights reflect the relative size of each country and are provided by Eurostat in the database. For additional information on the data, see Appendix V.

Source: ILO estimates using the 23 countries covered in the SES, 2014 (for the full list, see footnote 12 above).

represent 50 per cent or less of the workforce), the average wage is higher than in otherwise similar enterprises (on average, this gap on the left-hand side of the chart amounts to around €1 per hour). This suggests that differences in labour productivity may not be the only explanation for the lower wages paid in highly feminized enterprises. But clearly there remains a need for more complete data sets to shed light on this matter.

One hypothesis may be that the labour income share received by workers in highly feminized enterprises is low compared to that received by workers in male-dominated enterprises. If this is true, it would imply that there is less value attached to labour in highly feminized enterprises, even though the value of the work and production these enterprises bring to society may be comparable to those of other enterprises in sectors traditionally dominated by male wage employees. To pursue research on this point, we need data sets which include variables that allow researchers to estimate value added per worker at enterprise level in EEM data (such as the SES). In turn, this would allow us to better understand how enterprises set wages and to design gender policies that reflect the characteristics of the enterprise (see box 6).

The effects of parenthood status on wages

Recent literature shows that in various countries the gender pay gap is due at least in part to the "motherhood pay gap", defined as the pay gap between mothers and non-mothers. Lower wages for mothers may be related to a host of factors, including labour market interruptions or reduction in working time; employment in more family-friendly jobs which are lower-paying; or stereotypical hiring and promotion decisions at enterprise level which penalize the careers of mothers. The relevance of these factors in different countries depends on the

Box 6 The Swiss equal pay tool for small firms

In Switzerland, the Federal Constitution and the Equality Act legally oblige employers to respect the principle of equal pay for work of equal value. Furthermore, according to the Public Procurement Act, public authorities must not contract with firms that do not respect wage equality, and may check compliance. Since 2006, the Swiss Federal Office for Gender Equality has offered a self-test tool called Logib (www.logib.ch) which uses a multiple regression model to assess the average impact of a gender factor on wages while also taking into account objective, non-discriminatory factors. However, for technical reasons, this tool works best for firms with at least 50 employees.

A new tool has been developed which, unlike Logib, is based on a job evaluation methodology drawing on work science. According to the latter, each function implies requirements and demands. *Requirements* are defined as the skills necessary to perform a task. *Demands* are aspects of carrying out a task that may be detrimental to the worker. There is broad consensus that functions with higher requirements and demands should receive higher salaries. The new tool enables requirements and demands to be assessed on the basis of six factors (required level of education, autonomy, expert knowledge, responsibility, psycho-social and physical requirements, and psycho-social and physical demands). In addition, it takes into account the individual worker's experience.

An assessment using the new tool requires the employer to accomplish four simple steps:

(1) identification of existing jobs or functions;

(2) evaluation of each job;

(3) entering of employee data;

(4) attribution of jobs to employees.

Thereupon the tool automatically establishes an expected ranking of employees, which is then compared against the effective ranking based on actual salaries. Through pairwise comparison, the instrument identifies individuals occupying a lower actual wage rank than would be theoretically expected, compared to at least one person of the opposite sex. These individuals are flagged as potentially suffering wage discrimination.

By providing valuable information about compensation practices within just a few hours, this new tool enables employers to go into the matter more deeply and may eventually encourage them to make the necessary adjustments.

The latest version of the tool has been successfully tested with a few dozen small firms. Currently, further developments are under way to enhance customization and visualization and thereby increase its value added for small firms. The Federal Office for Gender Equality plans to make the tool freely available on the Internet, together with complete documentation, in the second half of 2019.

specific constellation of laws, policies, gender stereotypes and societal expectations (see, for example, ILO, 2015, for a comprehensive review of the literature on the "motherhood gap"). There are also empirical findings that point to the existence of a fatherhood pay gap – but in this case, fathers earn a wage premium over non-fathers, as opposed to suffering a wage penalty. Studies that look at the fatherhood gap are however scarce, and most refer to high-income countries (for example, Lundberg and Rose, 2000, for the United States, or Meurs, Pailhé and Ponthieux, 2010, for France).

Box 7 Parenthood status in the data – A word of warning

Contrary to common belief, the parenthood status of individuals is not always clearly identified in survey data. In the vast majority of surveys, individuals are identified *in relation to* the head of household, where the latter can be a man or a woman and is often perceived to be the bread-winner in the household. Typically, the question asked of all other household members is: "What is your relation to the household head?" Thus one can establish whether the head of household has a spouse, or children who live in the same household, or other relatives or non-relatives living with him or her. On the basis of answers to this question it is possible to assign a parenthood status to those household members who are classified as "heads". However, the parenthood status of other household members (not classified as heads) is not explicitly declared. For example, a household may have a head, a spouse, two children and two grandchildren living in the same dwelling. The variable that describes the relation between all household members identifies who is the head and the spouse and the fact that the head has two children: so the head is assigned a "parenthood" status. The fact that there are two grandchildren identified by their relation to the household head implies that one of the people declared to be a child of the head is probably a parent to the grandchildren of the head who live in the household. Surveys do not usually include additional information to help clarify who in the house is mother or father to these grandchildren; so these possible parents could end up being classified in the "non-parents" group.

In recent times, some surveys – especially in high-income countries – have started to include linking variables that identify the parental relation between members of the same household. This goes some way towards identifying more conclusively whether surveyed individuals are parents, even if in many cases this proves to be only a partial identification; for example, even if mothers and fathers are linked to the children registered as being part of the surveyed household, parents whose children have already left the household can be misclassified as "non-parents".

Our next set of estimates review the motherhood gap and the fatherhood gap for a selection of countries for which parenthood status can be identified. It is important to highlight at this point that parental status is not always clearly identified in survey data and that this can have non-negligible consequences for the correct estimation and interpretation of pay gaps due to parenthood status (see box 7).

How severe then is the wage penalty for being a mother? Table 9.2 shows estimates of the motherhood and fatherhood gaps for a selection of countries. The motherhood gaps in this table are estimated by simply comparing the hourly wages of non-mothers to the hourly wages of mothers, while the fatherhood gap compares the hourly wages of non-fathers to the hourly wages of fathers. A positive motherhood (or fatherhood) gap means that mothers (or fathers) earn less than non-mothers (or non-fathers). These estimates are presented with some caution, because the available survey data are seldom adequate for confident identification of the gender pay gap (see box 7). In fact, of all 23 countries shown in table 9.2, only three – Canada, Switzerland and Uruguay – supply survey data from which individuals can be clearly identified as mothers or fathers. For all other countries assumptions have to be made that can make the estimate less than entirely reliable. Having said that, the table supports a well-established empirical finding in the literature: namely, that mothers seem to suffer a wage penalty whereas

Table 9.2 Motherhood and fatherhood gaps for selected economies, latest years

Income group	Country	Motherhood gap	Fatherhood gap
High-income countries	Argentina	10.50	–0.30
	Australia	5.00	–7.30
	Brazil	7.70	–7.00
	Canada	1.20	–3.40
	Chile	2.40	1.90
	China	10.40	0.10
	Korea, Republic of	12.60	–26.00
	Mexico	5.80	–3.40
	South Africa	1.10	–16.40
	Switzerland	7.30	–17.20
	Turkey	29.60	2.40
	United States	4.30	–18.80
	Uruguay	6.10	–3.630
Middle- and low-income countries	Armenia	–6.70	1.60
	Egypt	–13.10	–10.90
	Madagascar	14.60	–4.50
	Mongolia	0.22	–1.95
	Peru	12.90	–5.90
	Philippines	4.80	8.40
	Russian Federation	14.70	2.00
	Tanzania, United Republic of	3.05	7.10
	Ukraine	–2.80	–11.20
	Viet Nam	–0.96	–8.30

Notes: Except for Canada, Switzerland and Uruguay (where the data provide direct identification of motherhood and fatherhood status), the estimates are based on declaring as "mother" or "father" anyone who is either a head of the house or the spouse of a head of the house in a household where at least one member is a child of the head of household. "Non-mothers" and "non-fathers" are members who do not fall within that definition. For all these countries, the sample is restricted to an age range that is country-specific but falls within the range of 25 years old to 50 years old. The country-specific variation is based on observing a cut-off point where at least 10 per cent of mothers are observed in that age group in the data. For more detail on data sources, see box 7.

Source: ILO estimates using survey data described in Appendix V.

fathers seem to be rewarded with a wage premium. The penalty can be as low as 1 per cent or less (Canada, Mongolia or South Africa) and as high as 30 per cent (Turkey).

In general, motherhood also leads to lower labour market participation. Figure 35 shows women's and men's labour market participation rates across age groups complemented with the gender pay gap estimated for each of the age

groups defined on the horizontal axis.[16] All estimates use latest years (for data sources, see Appendix V). It should be noted that this figure shows "labour market participants" rather than just wage employees.[17] In Viet Nam, for example, wage employment among women is less than 50 per cent (see figure 25) but labour market participation – at least between the ages of 30 and 50 – exceeds 80 per cent. The first noteworthy observation from figure 35 is that the low labour market participation of women vis-à-vis men is a global phenomenon. Irrespective of income level, in all countries and at any age group, women's participation rates are always below those of men. In some cases (such as Egypt) the rate is markedly lower, whereas in some others (Russian Federation, South Africa, Viet Nam) the difference is less marked. Second, for most countries, the trend in participation rates for women starts to separate further from that of men at about the age of 25–35 years old, coinciding with the beginning of the period of motherhood. Finally, in only a few of the countries shown here (Armenia, Australia, Mongolia, Philippines, Russian Federation, Ukraine) is there any "bounce back" into the labour market for women. In most other countries, it seems that motherhood has a long-term effect: once the participation of women declines at around the age of 25–30 years, the proportion of women who stay in (or out) of the labour market across all other age groups thereafter remains constant until approximately retirement age.

Although there is some variation among countries, it seems that in many countries the gender pay gap widens gradually from the younger to the older cohorts. What is also striking is that in all but four of the countries (Australia, Bangladesh, China, Russian Federation), the gender pay gap is positive at the point of entry into the labour market. Another striking feature is that in almost all countries – for example, in the Republic of Korea, the Russian Federation and the United States – as the gap increases, it makes a particularly marked "jump" after the first cohort. In the case of the United States, the steepest rise occurs after the first age cohort (up to age 20), where the gender pay gap increases from about 7 per cent among those aged 16–20 to about 12 per cent among those aged 21–30. Taken together, these observations suggest that women's labour market participation is affected differently from that of men at around the child-rearing years, that this effect impacts on wages, and that is not just a short-term effect but one with relatively long-term consequences for a significant proportion of women across the world.

16. In most societies, the age of parenthood (assumed to be between 15 and 49 years of age) overlaps to a considerable extent with the age of so-called "prime-age workers" (around 25–54 years of age). These definitions are approximations that can vary between countries and even between statistics and related agencies within countries. For example, the definition of "prime-age worker" is one that is officially established in Canada by the Canadian Bureau of Statistics, but this may not necessarily be the case in all countries. On the other hand, the use of the age range 15–49 for parenthood is very much driven by the fertility period of women: for example, the reproductive section of the Demographics and Health Survey, which has been widely implemented in low-income countries by USAID, is given only to women aged 15–49 because it is assumed that the likelihood of women having children at or beyond the age of 50 is close to zero.

17. Labour market participation includes all forms of employment – wage employees, employers, own-account workers, unpaid family workers – as well as the unemployed.

Figure 35 Age, participation and the gender pay gap, selected countries by income group, latest years

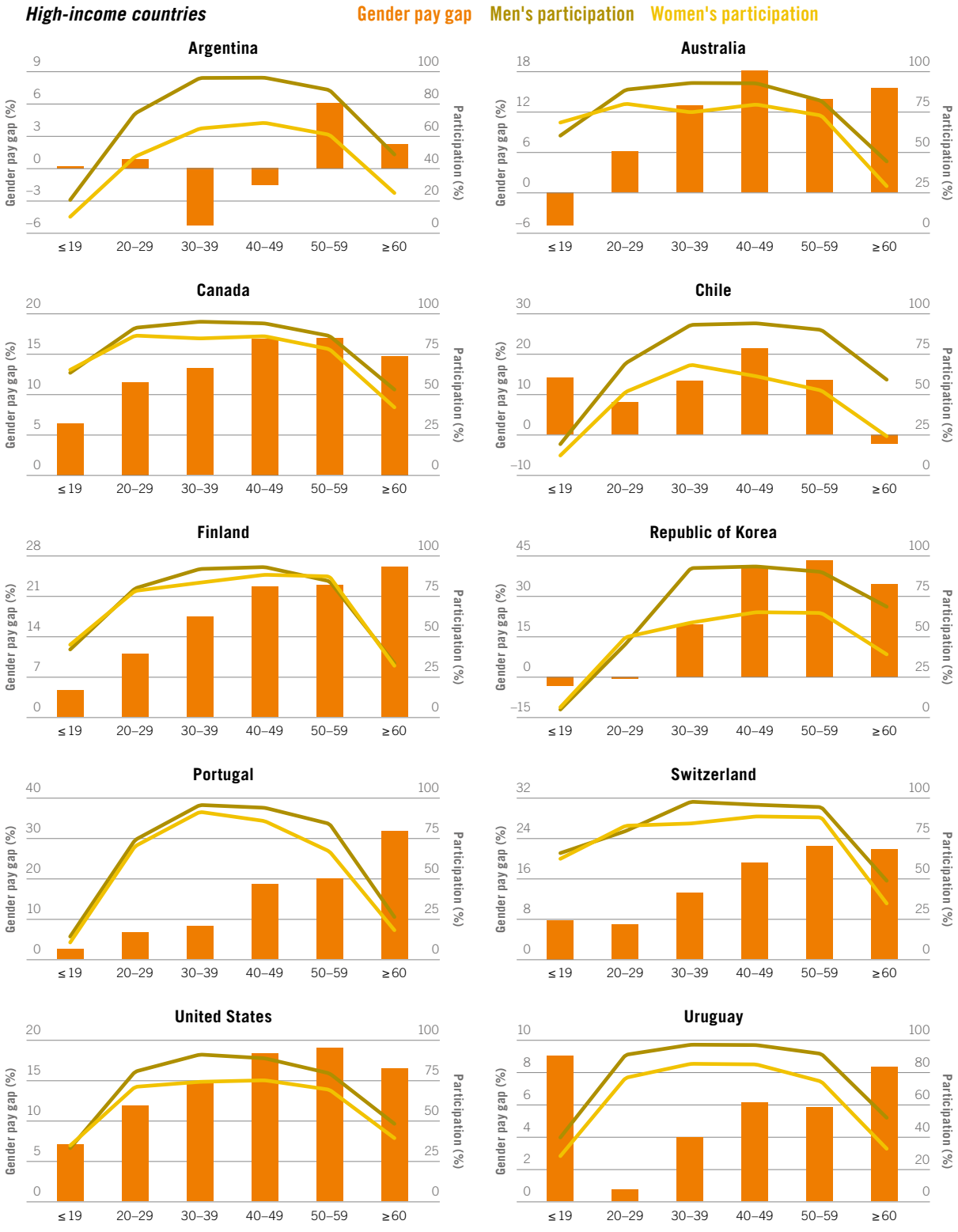


Figure 35 (cont'd)

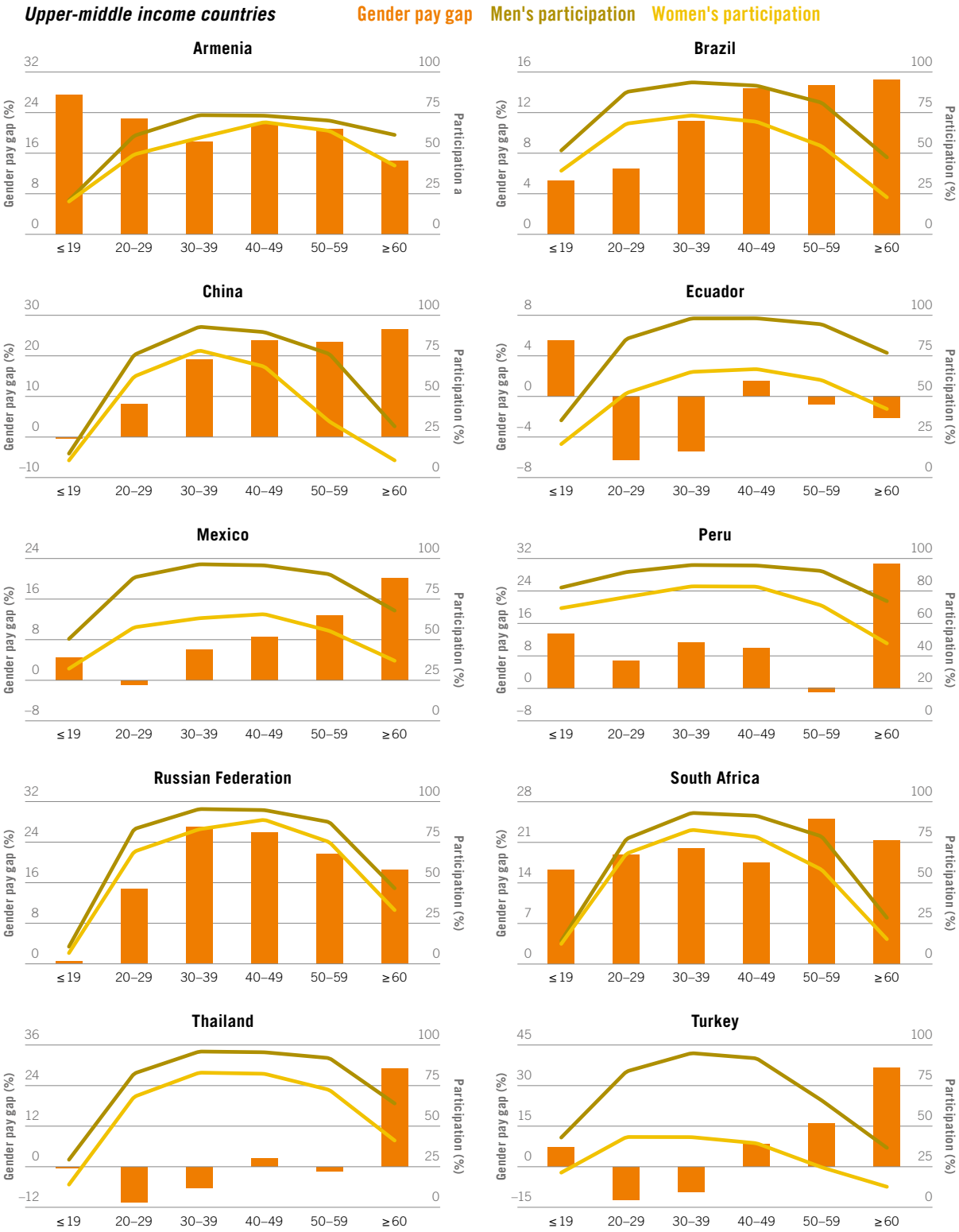


Figure 35 (cont'd)

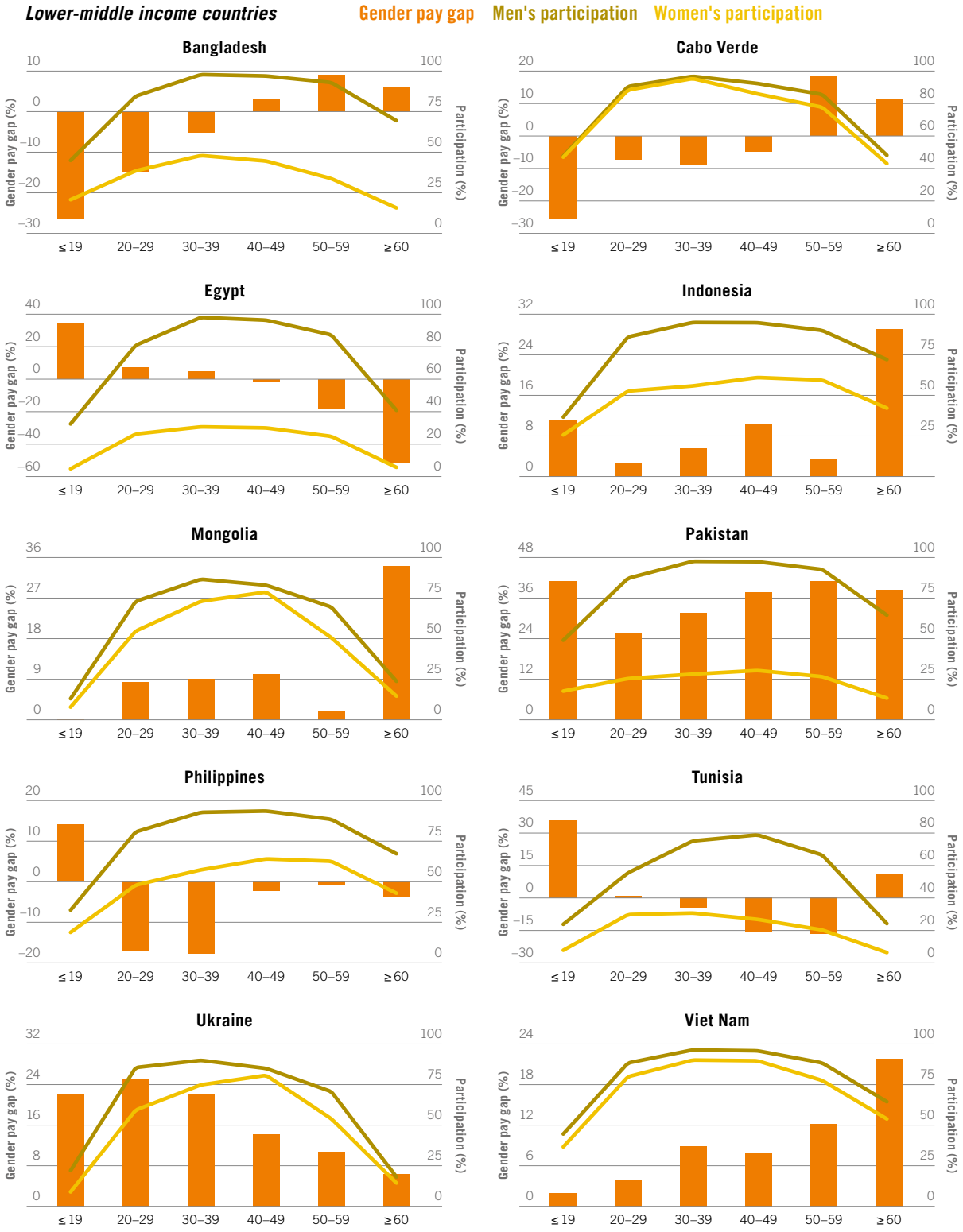
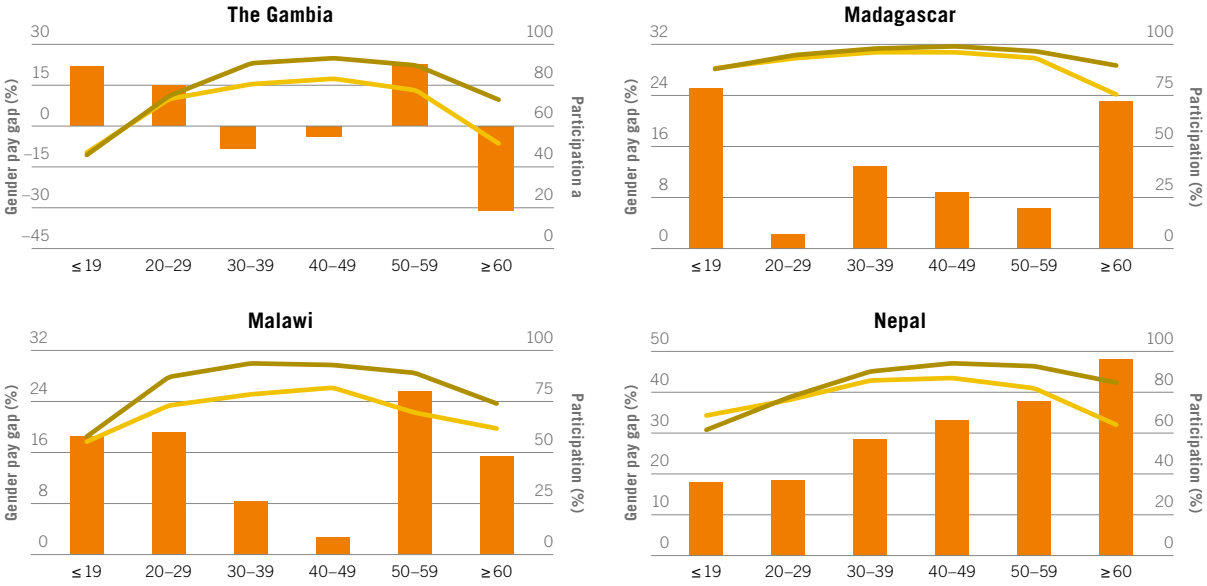


Figure 35 (cont'd)

Low-income countries Gender pay gap Men's participation Women's participation



Source: ILO estimates based on survey data provided by national sources (see Appendix V).

PART III Which way forward?

10 Measures for sustainable wage growth

Global wage growth in 2017 was not only lower than in 2016, but fell to its lowest growth rate since 2008, remaining far below the levels obtaining before the global financial crisis. Given the recovery in GDP growth in 2017 and the gradual reduction in unemployment rates in various countries, persistently slow wage growth in high-income economies represents somewhat of a puzzle and has been the subject of intense debate. Possible explanations for subdued wage growth include slow productivity growth, the intensification of global competition, the decline in the bargaining power of workers and the inability of unemployment statistics to adequately capture slack in the labour market, as well as an uncertain economic outlook which may have discouraged firms from raising wages.

Whatever the reasons, it is now widely recognized that wages are a crucial determinant of household income, and hence of aggregate demand and inclusive growth. Slow wage growth has thus been expressed repeatedly as a source of concern and the issue of wage growth has moved to the forefront of policy analysis and debates. The European Commission produced research on wage dynamics in the Economic and Monetary Union and both the 2018 Annual Growth Survey and the European Council Recommendations on economic policy emphasized that faster wage growth in the euro area would help to sustain domestic demand, reduce inequalities and ensure higher living standards, thus contributing to the realization of the fair wage principle of the European Pillar of Social Rights. In the context of the European Semester, some countries have been encouraged to explore conditions for higher wage growth, while respecting the roles of social partners. Both the OECD and the IMF have also published research on recent wage developments and their implications. The *OECD Employment Outlook* (OECD, 2018) observed that wage growth was "missing in action" and considered this as a sign that the economic recovery remains fragile. The *World Economic Outlook* (IMF, 2017) observed that inflation rates in high-income countries might remain low until wage growth accelerates beyond productivity growth in a sustained manner, and pointed out the implications in terms of the appropriate pace of exit from accommodative monetary policies.

All these concerns remind us of the importance of having a better understanding of what role wage policies – particularly minimum wages, collective bargaining and public sector pay – can play to ensure a better alignment between wage growth and productivity growth in countries where there has been a decoupling in the trends of these two variables. Another question is how better coordination at the international level might be used to promote sustainable wage growth which can support aggregate demand at national, regional and global levels.

This report has shown that in low- and middle-income countries, real wage growth has been more robust but with much diversity across countries and regions. In many countries, however, low pay and wage inequality remain a serious challenge on the road to achieving decent work and inclusive growth, as wages remain low and insufficient to adequately cover the needs of workers and their families. While globalization and technology have contributed to wage and income growth in some countries, one important question revolves around how low- and middle-income countries can retain a larger share of the value added generated in global supply chains.[1] Another challenge arises from the fact that, overall, in low- and middle-income economies an estimated 50 per cent of all wage employees continue to work in the informal economy, either in the informal sector or as informal workers in the formal sector (see ILO, 2018c).

Notwithstanding these challenges, a number of countries have recently undertaken measures to strengthen their minimum wage with a view to providing more adequate labour protection. For example, South Africa announced the introduction of a national minimum wage in 2018, while lawmakers in India are examining the possibility of extending the legal coverage of the current minimum wage from workers in "scheduled" occupations to all wage employees in the country. Collective bargaining remains more limited in low- and middle-income countries than in high-income countries, but some recent initiatives have sought to extend protection to more vulnerable categories of workers.

11 Reducing the gender pay gap

Using data from a large number of countries – which together represent around 80 per cent of the world's wage employees – Part II of this year's *Global Wage Report* has shown that, on average, women continue to be paid less than men across the world, with large variations among countries. Using average hourly wages of women and men, as in the UN Sustainable Development Goals (indicator 8.5.1), the report finds that the (weighted) global gender pay gap is approximately 16 per cent. However, there are large variations across countries and also depending on how the gender pay gap is measured. Using median monthly wages, the global estimate of the gender pay gap goes up to some 22 per cent.

The report highlights the multiple factors that can lie behind the existence of a gender pay gap in different national circumstances. In some countries, the gender pay gap may be larger at the top of the distribution, as in many high-income countries, whereas in others it may be larger in the middle or at the bottom of the distribution, as in many low- and middle-income countries. Furthermore,

1. Studies which have researched how global value chains are "sliced up" have shown that the share of value added accruing to workers in developing countries often remains very small. See, for example, Timmer et al., 2014.

the gender pay gap in different parts of the wage distribution may generally be due to differences in observable labour market attributes, such as lower levels of education for women, or they may be due to unexplained differences in returns for these attributes, the undervaluation of women's work in highly feminized occupations or enterprises, reduced or stagnant wages for women who are mothers, or quite simply lower pay for women than for men in spite of equal work or work of equal value in the same enterprise.

So what can be done to progressively reduce gender pay gaps across the world? While there is a range of policies and measures that can be taken to reduce gender pay gaps, the answer to this question will necessarily be country-specific since the factors that drive and explain gender pay gaps vary from country to country and in different parts of the wage distribution. The sections that follow highlight some of the policy implications emerging from the report.

12 The need for better data

To begin with, the report highlights the need for better data on the distribution of wages. Many countries, particularly low- and middle-income countries, have very limited statistics on wages. These data are sometimes collected through episodic labour force surveys, establishment surveys that omit non-registered enterprises, or administrative mechanisms which only cover workers affiliated to social security structures. Such data may lead to unreliable estimates of gender pay gaps.

One feasible option would be to review and modify existing surveys by introducing, for instance, modules specifically relating to gender pay gaps into cross-sectional surveys. The use of modules to pick up specific information is an extended practice when collecting survey data, with modules integrated sporadically to pick up information on a particular population group (for example youth, or rural communities) or particular events (such as retirement decisions). In many countries, modules are used to pick up information specifically about women (for example, the 2012 Jordanian Woman's Questionnaire, administered as part of the 2012 Jordanian Population and Family Health Survey). What we propose here is not a module on matters related to women only, but the design and subsequent integration of modules that are carefully thought out to cover matters that are identified as potential determinants of the gender pay gap. As the gender pay gap is a slowly changing statistic, the module could be administered sporadically, not necessarily every year. This would be a very cost-effective instrument to produce sufficiently rich survey data to improve the understanding of the factors contributing to the gender pay gap.

A potent illustrative example of this point is the study of the motherhood gap. In existing survey data, the household respondent is usually asked to declare who lives in the household and what is the relation of each household member to her or to him. This tells us whether the head of household has a spouse, and if certain

other members of the household are her or his children. We can only guess at the interrelationships between the other household members, and this often leaves the identification of "motherhood" and "fatherhood" to a subjective classification. Likewise, we do not know the exact number of children attached to each adult in the household, because when children are no longer living in the household, they will usually not be part of the survey. This is just one example of how surveys could be improved to provide better information related to the gender pay gap.

In most countries, existing surveys take the form of a cross section, meaning that the data are collected at regular intervals (for example, once a year or once every two years) and each time from a completely different set of individuals – as opposed to surveying the same individual or household over a sequence of periods, which is the case with panel data. A snapshot of a person's life – which is what cross-sectional data sets provide – can contribute significant amounts of information to an understanding of wages at a particular point in time for the population, on average. However, it is also crucial to understand what goes on outside the "snapshot framework" picked up by the data at one point in time, for two reasons: first, it can provide a better understanding of the factors that determine the gender pay gap; and, second, it can help policy-makers to design policies that help to even out the effects of life-cycle events on men and women, even before they enter the labour market. This is why panel data can go some way towards solving certain of the issues related to the interpretation of life-cycle events.[2]

13 The need to move beyond simple measures of the gender pay gap

The classic method of measuring the gender pay gap is to calculate the difference in pay between men and women in relation to men's pay. For reasons of simplicity, this measure relies on either the average wage among all wage employees (the mean) or the wage that represents the middle wage earner in the population (the median). Both measures provide a simple summary of the wage dispersion among all wage employees in a population.

In some countries, however, these basic summary measures can generate very different and sometimes even contradictory results, providing information which is of limited use for policy-makers. This is particularly the case where women's labour force participation is low and where women cluster in particular sectors and occupations. The report thus recommends going beyond summary measures, even

2. This is particularly important at a time when a sizeable and growing portion of the workforce is starting to work in what is known as non-standard forms of employment, and where the change in relation between employee and employer can have implications in terms of pay differentials between women and men; see Adams and Berg, 2017.

though they are popular indicators, to inspect in more detail the wage structure of men and women.

Part II of this report has suggested the use of a "factor-weighted" gender pay gap that takes into account the possible composition effects in the population. Because the factor-weighted gender pay gap controls for some of the major composition effects that can vary over time, a time series of factor-weighted gender pay gaps is a useful complementary tool with which to analyse the evolution of gender pay gaps over time. It is also a relatively simple method which can easily be implemented.

14 Exploring the gender pay gap across the wage distribution, and reviewing the effectiveness of labour market institutions

An important question is whether the gender pay gap in a particular country is mostly driven by pay gaps at the bottom, in the middle, or at the top of the wage distribution. The report has shown that among high-income countries the gender pay gap tends to widen at the upper end of the distribution: for example, in the case of Belgium the gender pay gap is about 3 per cent at the bottom but increases to about 13 per cent at the top. In contrast, in low- and middle-income countries it is at the low end of the wage distribution – where women are proportionally over-represented – that the gender pay gap is widest. But whether the "sticky floor" or the "glass ceiling" dominates varies from country to country, with quite obvious policy implications. For example, a minimum wage could reduce the gender pay gap at lower wage levels, collective pay agreements could have the same effect higher up in the wage distribution, while policies that promote greater representation of women in senior and highly paid positions could have a positive effect at the top levels.

Minimum wages have been found to be effective at reducing gender pay gaps at the bottom of the wage distribution, particularly when they are well designed and serve as an effective wage floor. To maximize the effect of minimum wages on gender pay gaps it is necessary to ensure that minimum wages do not themselves discriminate, directly or indirectly, against women, for example by setting lower wage levels in sectors or occupations where women predominate, or even excluding female-dominated sectors or occupations from legal coverage. A case in point is domestic work, carried out by over 65 million workers across the world, most of them women. In many countries, domestic work is excluded from the coverage of labour law because it is not considered as "work". In other countries, domestic work may be covered by law but may not be afforded treatment on a par with other types of work. For example, the minimum wage paid to unskilled labour may not apply to domestic workers, or may apply at a rate much lower than that set for other workers.

Collective bargaining can be an effective mechanism for closing gender pay gaps, particularly at the low and middle parts of the wage distribution (see Pillinger, Schmidt and Wintour, 2016). It can also help reduce wage disparities both within and across sectors and firms. This is partly because countries with greater collective bargaining coverage tend to have less wage inequality in general, and also because collective agreements can be aimed at reducing gender pay gaps, especially when mandated by law, as is the case in France.[3] In particular, collective agreements can focus on reconciliation of work and family needs; increased transparency of company pay differentials; higher pay rises for female-dominated job classes; right to re-entry after maternity leave; and gender-neutral job evaluations to avoid gender biases in job classification and pay systems. However, different industrial relations systems have differentiated impacts on the gender pay gap. The level of collective bargaining is also likely to affect the gender pay gap: some studies show that the more centralized the level of collective bargaining, the smaller the size of the gender pay gap (Sissoko, 2011). It has therefore been suggested that, in countries where company-level bargaining is the norm, social partners could adopt common guidelines for gender-sensitive collective bargaining to orient negotiations by their respective members at the company level (Eurofound, 2010).

Collective bargaining geared towards the removal of the discriminatory portion of the gender pay gaps has huge potential to reduce gender pay inequalities. It is also consistent with the view that a more proactive duty – and this includes compliance with equal pay laws, rather than sole reliance on individuals to file complaints – is a more promising approach (Hepple, 2007). However, there is a risk that social partners may dilute their commitment to pay equity goals when other competing priorities arise, such as wage moderation or the protection of jobs during dire economic circumstances. Their views may also vary regarding the nature of equal pay problems or the way in which to address them, with some contending that the gender pay gap is an issue for government to deal with, thereby undermining the impact of collective bargaining by reducing it (Smith, 2012). Negotiating and/or extending agreements covering categories of workers more vulnerable to low pay can also be very useful, particularly in female-dominated occupations or sectors.

Factors that can facilitate collective negotiations on gender equality include the entry of women into employer and union leadership and collective bargaining teams; enabling legislation that establishes a framework for gender equality bargaining; the overall regulatory environment; and the existence of workers' and employers' strategies to improve gender equality at the workplace. Likewise, the active and direct role of trade unions and employers' organizations can have a significant impact in reducing gender pay gaps. In particular, the revaluing of women's work could be greatly enhanced if trade unions and employers' organizations start to identify where gender inequalities are embedded within their own systems (Rubery and Johnson, forthcoming), while policies and actions that help

3. Loi relative à l'égalité salariale entre les femmes et les hommes, Act No. 2006-340, *Journal officiel*, No. 71, 23 March 2006.

women reach top positions, thus breaking the so-called "glass ceiling" in business, can bring about a gender balance in management teams and boards of directors (ILO, 2015). The latter has proven to have a positive impact on business performance, as shown in numerous studies (McKinsey & Company, 2017; Catalyst, 2012; Curtis, Schmid and Struber, 2012).

That said, while minimum wages, collective bargaining and corporate activities can greatly impact gender pay inequalities, it is important to recognize that workers in the informal economy are either not covered by existing laws or are covered in principle only – for example, by international labour standards – but not in practice. According to recent ILO estimates, 61.2 per cent of the world's employed population and 39.7 per cent of all wage employees are in informal employment. Women in informal wage employment generally face a double penalty: informal economy workers receive on average lower wages than workers in the formal economy and women in general are paid lower wages than men on average. Measures that promote the formalization of the informal economy can thus greatly benefit women, bringing them under the umbrella of legal and effective protection that in principle helps to reduce the gender pay gap and empowers them to better defend their interests.

15 Tackling the "explained" part of the gender pay gap: Education, polarization and occupational segregation

The decomposition analysis in the report shows that part of the gender pay gap can be explained by differences in the labour market attributes of men and women, including their level of education and their choices of occupations or industries. It is important to note that saying that part of the gender pay gap may be explained by differences in attributes does not imply that this part of the gap is "admissible", as it may itself reflect gender inequalities in access to education or in other spheres at home and at work.

Perhaps surprisingly, the report has found that in many countries only a small part of the gender pay gap can be explained by differences in levels of education between men and women. In high-income countries, education contributes on average less than 1 percentage point of the gender pay gap, though it contributes much more in some individual countries, such as the Czech Republic, the Republic of Korea or Slovakia. This general finding is not so surprising, since – as we have seen in the report – in high-income countries the educational attainment of women in paid employment is in many instances higher than that of men; lower educational attainment thus cannot be an explanation for the gender pay gap. More surprisingly, perhaps, lower educational attainment is not a particularly prominent factor in explaining the gender pay gap in a majority of low- and middle-income countries, either, even though in many of these countries women often have lower educational attainment than men. In practice, however, a large share

of little-educated women stay out of the labour market or work as own-account workers rather than paid employees. If anything, women in paid employment tend to be more educated than men within similar occupational groups. Thus, while educational policies targeting enrolment rates among girls may contribute to increasing the future labour market participation of women, they may not necessarily reduce gender pay gaps in all countries.

Among the other factors that explain gender pay gaps to a greater or lesser extent across countries is the concentration of women in a much smaller and different range of sectors and occupations relative to those in which men prevail. Occupational segregation can be a reflection of different choices. For example, women are less likely to undertake studies and pursue occupations in the areas of science, technology, engineering and mathematics (STEM), which offer better-paid employment opportunities. Furthermore, when women do enter STEM professions in sectors such as information and communications technologies (ICT), they tend to be concentrated in the less well-paid occupations such as ICT management rather than ICT software development. Some countries have therefore introduced programmes specifically designed to change this situation and attract more women into STEM fields. These may range from raising awareness of STEM careers for women to organizing related job fairs, financial and in-kind support for STEM programmes targeting women and offers of internships and career advice (G20, 2018).

Occupational segregation also arises in part because of enduring stereotypes and employer prejudice in hiring and/or promotion decisions. Action on both fronts can contribute to reducing occupational segregation, namely encouraging more girls to engage in STEM studies and attracting more men into the education and health sectors.[4] But for these sectors to appeal to men, the social status and average earnings must improve. Work-related violence and harassment against women, especially in sectors or occupations where they constitute a minority, may also act as a deterrent, discouraging women from entering or remaining in better-paid, male-dominated jobs (ILO, 2018e; Pillinger, 2017).

4. Interestingly, a recent study by researchers at the University of Valencia in Spain shows that even within STEM-related studies there is a gender bias in the selection of subfields of study that is driven by stereotypical beliefs. Using responses from a representative sample of undergraduate students, the research shows that both women and men students believe that the profession exercised by economists is both male-dominated and dominated by macroeconomic topics (as opposed to microeconomic ones). Such a belief, which is by no means a reality in the profession, has a large impact on how women justify the grades they obtain in macroeconomic subjects and on the selection of the subfields of study for their economics degree; on the other hand, it has no impact on how men students perceive their grades or select their subfields of study in economics (Beneito et al., 2018).

16 Tackling the "unexplained" part of the gender pay gap: The undervaluation of work in feminized occupations and enterprises, and implementation of equal pay

Much of the gender pay gap, in many countries, thus remains unexplained by differences in education and in other labour market attributes such as age, experience, occupation or industry. Indeed, in all income groups, the unexplained part of the gender pay gap dominates. It is thus important to "unpack" at the national level the reasons behind this portion of the gender pay gap.

The report shows that, for a selection of countries, returns from education are clearly lower in highly feminized occupations than in other occupations, and that average wages are lower in highly feminized enterprises than in other enterprises, even after controlling for some other characteristics. This imbalance may be linked to the overall undervaluing of women's work, which "means that skill and experience in female-dominated occupations and workplaces tend to be rewarded unfairly" (Grimshaw and Rubery, 2015, p. vi). These findings also tend to support that part of the literature which finds that the gradual entry of women into industries or jobs traditionally held by men is usually associated with a decline in average earnings therein (Murphy and Oesch, 2015). Eliminating this bias is not only a way to reduce the gender pay gap directly but also a condition for reducing occupational segregation, for example by attracting more men into the education and health sectors, and ensuring that women get a fair deal in the workplace. With this in mind, New Zealand has recently upgraded the remuneration of 329 education support workers with a pay rise of up to 30 per cent. This signifies an historic settlement for pay equity and paves the way for other women in the education sector.

In the literature, authors frequently attribute part of the unexplained gender pay gap to discrimination against women in relation to men. Such discrimination occurs when women are paid less than men for the same work or for work of equal value. Direct wage discrimination includes cases in which two jobs that are the same are given different titles, depending on the gender of the person who performs them, and are paid differently, with men's occupations typically associated with higher wages than women's. Examples include the titles of "chef" for men versus "cook" for women; or "information manager" versus "librarian"; or "management assistant" versus "secretary". Injustice also occurs when women are paid less than men for work of equal value, namely work that may differ in respect of the tasks and responsibilities involved, the knowledge and skills required, the effort it entails and/or the conditions under which it is carried out, and is yet of equal worth. Indirect wage discrimination is more subtle and more difficult to detect. It may manifest itself in different structures and customary practices, including, for instance, in the way in which wages are structured and the relative weight in overall remuneration of seniority or of bonuses that reward long hours of continued presence in the workplace. In such situations, women are more likely to be penalized as a consequence of their family responsibilities.

In an attempt to ensure equal pay between men and women, a growing number of countries have passed national legislation which prohibits lower pay

for equal work, or for work of equal value. But while most countries have enacted legislation to address gender discrimination in remuneration, only 40 per cent of all countries have embodied the full principle of "equal pay for work of equal value", while many focus instead on the narrower principle of "equal pay for equal work" (World Bank Group, 2018; Oelz, Olney and Tomei, 2013). In addition, some countries have taken steps to promote pay transparency to expose differentials between men and women. For example, since early 2018, Germany requires enterprises with 200 or more wage employees to disclose the earnings of their employees – of whatever gender – on demand by any of the employees working in those companies. Similar provision has been made in the United Kingdom, where, since April 2017, all companies and public sector organizations employing 250 or more people are required to publish data on the difference between mean and median wages and bonuses, as well as the gender pay gap at different pay scales. Furthermore, businesses with more than 500 employees must, with effect from 2018, provide regular financial reports on the specific efforts they are making to remove inequality between genders.

Gender pay gap reporting, by exposing the size of the gender pay gap, helps point to the existence of possible instances of pay discrimination and therefore diminishing the risk of an unequal pay claim. Equal pay audits are another important tool which helps reveal which factors drive pay. They are useful for detecting possible flaws in a company's pay practices. In 2013, the UK Government adopted new regulations that require employment tribunals to impose on employers who have lost an equal pay claim to carry out an equal pay audit.

In recent years, a number of countries have embraced proactive pay equity laws, which require employers to regularly examine their compensation practices, assess the gender pay gap and take action to eliminate the portion of the gap due to discrimination in pay. In some jurisdictions, namely Iceland or the provinces of Ontario and Quebec, the elimination of such gaps is compulsory, while in other cases, for example Switzerland, employers with 50 employees or more are not mandated to carry out a pay audit and remove the discriminatory part of the pay difference, but are obliged to do so if they wish to participate in public tenders. To encourage employers to comply with the law, the Swiss Federal Office for Gender Equality has developed and made available for free an online self-assessment tool, Logib (see box 6 in Part II); more recently, it has been working towards developing a self-assessment tool aimed at smaller enterprises with fewer than 50 employees. In Iceland, since January 2018, companies and government agencies with more than 25 employees are required to obtain government certification from an independent entity that certifies that their pay policies are gender-equal. Those failing to demonstrate pay equality face fines. This is a fast-track policy measure adopted by Iceland with the aim of closing the gender pay gap by 2022. Countries that have enacted proactive pay equity legislation have also put in place mechanisms that envisage the regular monitoring and impact assessment of the adopted measures with a view to reorienting or adjusting action on a continuous basis to achieve greater policy effectiveness.

17 Reducing the motherhood pay gap

Recent literature shows that in various countries the gender pay gap is due in part to the "motherhood pay gap", defined as the pay gap between mothers and non-mothers. This report shows that mothers appear to suffer a wage penalty whereas fathers seem to be rewarded with a wage premium. Our estimate of the motherhood penalty ranges from 1 per cent or less in Canada, Mongolia or South Africa to as much as 30 per cent in Turkey.

Lower wages for mothers may be related to a host of factors, including labour market interruptions or reductions in working time; employment in more family-friendly jobs, which are lower-paying; or stereotypical hiring and promotion decisions at enterprise level which penalize the careers of mothers. It has been argued, for example, that in some countries women prefer public-sector jobs, even when they pay lower salaries, because they offer shorter and more flexible working hours. In other instances, it has been argued that women who are mothers prefer employment in family-friendly jobs, or part-time jobs, which pay lower wages.

What can be done to reduce the motherhood pay gap? More equitable sharing of family duties between men and women, as well as adequate childcare and elder-care services, would in many instances lead to women making different occupational choices. In other words, some of women's choices or expectations may be the result of enduring gender-based stereotypes and imbalances in unpaid care work and family responsibilities, and may also be affected by the lack of adequate public provision in areas such as childcare services or adequate company policies on flexible working-time arrangements. The lack of programmes supporting women's return to work after childbirth also contributes to the wage penalty that women face when resuming work after a prolonged period of absence from the labour market. While all workers face such a wage penalty, it seems to be greater for women. Increasing the right of men to parental leave would also help to rebalance the perception held by employers – both women and men – of women wage employees as mothers.

18 Time to accelerate progress in closing gender pay gaps

Never before has awareness of and commitment to gender equality at work, as well as in society, been so prominent in national and international public debates. The UN Sustainable Development Goal 8.5 sets the target of "achiev[ing] full and productive employment and decent work for all women and men, including for young people and persons with disabilities and equal pay for work of equal value" by 2030. To support this Goal, the Equal Pay International Coalition (EPIC), which was launched in September 2017 as a multi-stakeholder initiative that includes the ILO, UN Women, OECD, ITUC, IOE and many governments

and companies, seeks to achieve equal pay for men and women. There is thus an international momentum in favour of concrete and coordinated action to tackle gender inequality. At EPIC's Pledging Conference during the United Nations General Assembly in New York in September 2018, approximately 40 governments and/or organizations made important commitments, which included the following: the creation of a Pay Equity Celebration Day; the elimination or reduction of the gender pay gap by a given percentage; the establishment of national commissions to monitor state intervention on equal remuneration; or the provision of financial support for gender pay gap data collection in selected publicly listed companies.

In practice, however, progress in reducing gender pay gaps has been too slow. It is clear that more vigorous and decisive action is needed. In addition to the specific measures discussed above, we set out a few more general considerations.

First, accelerating progress will require both political commitment and social transformation. While public policies to enhance education, labour and social protection and improve social infrastructure are necessary to close the gender pay gap, their effectiveness depends at least in part on shifting social norms and gender stereotypes. This imperative applies to all countries and societies, irrespective of their level of development. There is a vast body of evidence that unconscious bias plays a pivotal role in gender inequality in general, and that it contributes to low female labour participation rates and the gender pay gap in particular (Bohnet, 2016). There are also well-entrenched gender stereotypes concerning what women and men are "good at" and what their respective roles should consequently be in the family, at work and in society.

Second, comprehensive, cross-cutting approaches to gender equality are necessary to combat the gender pay gap. Indeed, not only are gender pay gaps rooted in well-entrenched stereotypes, they also represent a summary indicator that captures many disadvantages faced by girls and women both within and outside the labour market. As Part II of this report has shown, a gender pay gap can be a result of inequality in many spheres, including education outcomes, the division of work within the household and/or unequal access to certain types of jobs. These interlinkages strongly suggest that measures to reduce or eliminate gender pay gaps should be embedded in a broader overall gender equality policy. Indeed, gender pay gaps can only be closed where continuing progress is made towards gender equality at work and in society at large. At the same time, rewarding women's jobs fairly would help reduce occupational segregation by making jobs usually held by women more attractive to men. The need for a comprehensive approach is reflected in the fact that many countries have recently created national gender equality commissions to identify action on multiple fronts. Such commissions should be based on social dialogue and ensure the direct participation, or at least full consultation, of social partners.

Third, we emphasize once again that the appropriate mix of policies in any national context will depend on that particular country's circumstances, and that robust analytical work is needed to identify the largest contributory factors – and hence the most effective remedies – in different country contexts. Part II of this report has proposed some ways to break down and analyse gender pay gaps with

a view to better understanding what lies behind these gaps in different countries, and to helping governments and social partners identify the most effective policy actions. At the same time, one must keep in mind that while the magnitude of gender pay gaps is always a reflection of inequalities women face at home and in the workplace, these gaps are also to some extent a manifestation of general wage inequality in any particular country. Blau and Kahn (2003) were perhaps the first to show that differences in wage compression are important factors in explaining differential gender pay gaps across high-income countries at a particular point in time. This implies that reducing gender pay gaps requires both specific gender equality policies and more general policies and labour market institutions that promote inclusive labour markets (see Rubery and Koukiadaki, 2016).

Appendix I

Global wage trends: Methodological issues

The methodology to estimate global and regional wage trends was developed by the ILO for the previous editions of the *Global Wage Report* in collaboration between technical departments and the Department of Statistics, following proposals formulated by an ILO consultant (Mehran, 2010) and three peer reviews conducted by four independent experts (Tillé, 2010; Jeong and Gastwirth, 2010; Ahn, 2010). The entire methodology was peer reviewed again in 2017 by an external expert (Karlsson, 2017). This appendix describes the methodology adopted as a result of this process.

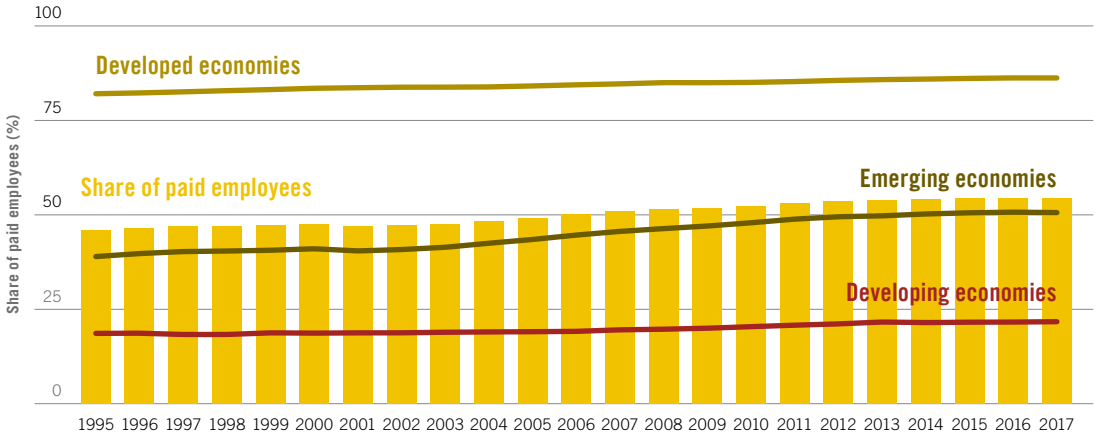
Concepts and definitions

According to the international classification of status in employment (ICSE-93), "employees" are workers who hold "paid employment jobs", that is, jobs in which the basic remuneration is not directly dependent on the revenue of the employer. Employees include regular employees, workers in short-term employment, casual workers, outworkers, seasonal workers and other categories of workers holding paid employment jobs (ILO, 1993).

As economies advance in terms of economic development, the proportion of workers who become wage employees usually increases: this is because own-account workers find better opportunities as wage employees. Female labour force participation also tends to be positively related to economic development. As a result, wage trends are affecting an increasing share of the employed population across the world. At the same time, not all people who work are paid employees. Particularly in low- and middle-income countries, many are either self-employed or contributing to family businesses. Such workers receive an income from their work, but not a wage from an employer.

Figure A1 shows that the share of paid employees (or wage employees) has increased by about 10 percentage points during the last 20 years, rising from 45.9 per cent in 1995 to 54.3 per cent in 2017. In developed economies, where the incidence of own-account work is relatively low and female participation is higher, the percentage of wage employees relative to the total employed has remained high and stable during the observed period. The share of paid employees in developing economies remains low (around 20 per cent). Consequently, the global increase is driven mostly by emerging countries, which have seen an increase of roughly 12 percentage points (from 38.9 per cent to 50.5 per cent) in wage employees in the two decades since 1995.

Figure A1 Share of paid employees in total employment, 1995–2017



Note: Country groups are those used by the ILO (see Appendix III).

Source: ILO estimates based on ILOSTAT.

The word "wage" refers to total gross remuneration including regular bonuses received by employees during a specified period of time for time worked as well as time not worked, such as paid annual leave and paid sick leave. Essentially, it corresponds to the concept of "total cash remuneration", which is the major component of income related to paid employment (ILO, 1998). It excludes employers' social security contributions.

Wages, in the present context, refer to real average monthly wages of employees. Wherever possible, we collected data that refer to all employees (rather than to a subset, such as employees in manufacturing or full-time employees).[1] To adjust for the influence of price changes over different time periods, wages are measured in real terms, i.e. the nominal wage data are adjusted for consumer price inflation in the respective country.[2] Real wage growth refers to the year-on-year change in real average monthly wages of all employees.

In light of the differences in definitions and the absence of wage figures which are completely disaggregated for every country by each component of wages (including bonuses, family allowances, sick leave, etc.), the *Global Wage Report* has to date focused on identifying changes over time within countries instead of comparing wage levels across countries.

1. Aiming for the broadest possible coverage is in line with the idea that decent work and hence adequate earnings are of concern for all workers, and that statistical indicators should cover all those to whom an indicator is relevant. See ILO, 2008.

2. This is done on the basis of the IMF's consumer price index (CPI) for each country. In cases where our national counterparts explicitly provide a real wage series, the real wage series is used in place of the nominal series deflated by the IMF CPI.

Box A1 What are wages?

Wherever possible, in this report wages are defined according to the ILO definition of earnings adopted by the 12th International Conference of Labour Statisticians (ILO, 1973). They include:

(1) Direct wages and salaries for time worked, or work done. These cover: (i) straight-time pay of time-rated workers; (ii) incentive pay of time-rated workers; (iii) earnings of piece-workers (excluding overtime premiums); (iv) premium pay for overtime, shift, night and holiday work; and (v) commissions paid to sales and other personnel. Included are: premiums for seniority and special skills; geographical zone differentials; responsibility premiums; dirt, danger and discomfort allowances; payments under guaranteed wage systems; cost-of-living allowances; and other allowances.

(2) Remuneration for time not worked comprises: direct payments to employees in respect of public holidays; annual vacations; and other time off with pay granted by the employer.

(3) Bonuses and gratuities cover: seasonal and end-of-year bonuses; additional payments in respect of vacation periods (supplementary to normal pay); and profit-sharing bonuses.

Earnings include cash earnings and in-kind payments, but the two should be distinguished from each other.

Labour cost and compensation of employees are related concepts, both of which are broader than earnings. For example, labour cost is the cost incurred by the employer in the employment of labour and includes, as well as earnings, other elements such as: food, drink, fuel and other payments in kind, and cost of workers' housing borne by employers; employers' social security expenditure; cost of vocational training; cost of welfare services (e.g. canteen, recreational facilities);* labour costs not classified elsewhere (e.g. cost of work clothes); and taxes regarded as labour cost (e.g. taxes on employment or payrolls). For a detailed description of these elements, see ILO, 1966.

* Defined from the employer perspective.

Source: ILO, 1973.

Census approach

The methodology used for the global and regional estimates is a census method with non-response. In the census approach, the objective is to find wage data for all countries and to develop an explicit treatment in the case of total non-response (see "Treatment of total non-response" below). We have tried to collect wage data for a total of 188 countries and territories, grouped into six separate regions.[3] To enable easier comparison with regional employment trends, our regional groupings are compatible with those used in the ILO's Global Employment Trends Model (GET Model) (see Appendix II, table A1; Appendix III, tables A2 and A3). Tables A4 and A5 indicate global and regional coverage (see Appendix IV).

3. Excluding countries and territories for which data on employment are not available from the ILO's Global Employment Trends Model (GET Model), more specifically some small countries and territories (e.g. the Holy See and the Channel Islands) that have no discernible impact on global or regional trends.

Treatment of item non-response

In some countries for which we found data, the statistical series were incomplete, in the sense that data for some years were missing. Table A5 provides coverage information for each year from 2007 to 2017. As expected, the coverage of the database becomes lower for the most recent years since some statistical offices were still processing these data at the time of preparing this report.

While the coverage in the most recent year is good in the developed economies and in Eastern Europe and Central Asia, in other regions, such as the Arab States and Africa, it is less so. For this reason, regional growth rates are flagged as "provisional estimates" when they are based on coverage of around 75 per cent and as "tentative estimates" when the underlying coverage of our database is between 30 per cent and 60 per cent, to draw attention to the fact that they might be revised once more data become available.

To address this kind of item non-response (i.e. gaps in the spread of countries for which we have data) a "model-based framework" is used to predict missing values.[4] This is necessary in order to hold the set of responding countries constant over time and so avoid the undesired effects associated with an unstable sample. Several complementary approaches were used, depending on the nature of the missing data points; these are described in detail in Appendix I to the 2010/11 edition of the *Global Wage Report* (ILO, 2010a).

Treatment of total non-response

Response weights

To adjust for total non-response (when no time series wage data are available for a given country), a "design-based framework" was used in which non-response was considered as a sampling problem. Because non-responding countries may have wage characteristics that differ from those of responding countries, non-response may introduce a bias into the final estimates. A standard approach to reduce the adverse effect of non-response is to calculate the propensity of response of different countries and then weight the data from responding countries by the inverse of their response propensity.[5] This implies that no imputations are made for non-responding countries.

In this framework, each country responds with a probability φ_j and it is assumed that countries respond independently of each other (Poisson sampling design). With the probabilities of response, φ_j, it is then possible to estimate the total, Y, of any variable y_j:

$$Y=\sum_{j\in U} y_j \qquad (1)$$

4. This is in line with standard survey methodology, where a model-based framework is generally used for item non-response, while a design-based framework is used for questionnaire non-response.

5. For a discussion of the missing data problem, see also ILO, 2010b, p. 8.

by the estimator

$$\hat{Y}=\sum_{j\in R}\frac{y_j}{\phi_j} \tag{2}$$

where U is the population and R is the set of respondents. This estimator is unbiased if the assumptions are true (see Tillé, 2001). In our case, U is the universe of all countries and territories listed in table A1 and R is those "responding" countries for which we could find time series wage data.

The difficulty, however, is that the response propensity of country j, φ_j, is generally not known and must itself be estimated. Many methods are available in the literature to estimate the response propensity (see e.g. Tillé, 2001). In our case, the response propensity was estimated by relating the response or non-response of a given country to its number of employees and its labour productivity (or GDP per person employed in 2011 US$PPP). This is based on the observation that wage statistics are more readily available for richer and larger countries than for poorer and smaller countries. The number of employees and labour productivity are used since these variables are also used for calibration and size weighting (see below).[6]

For this purpose, we estimated a logistic regression with fixed effects as follows:

$$prob(response)=\Lambda(\alpha_h+\beta_1 x_{j2008}+\beta_2 n_{j2008}) \tag{3}$$

where x_{j2008} is ln(GDP per person employed in 2011 US$PPP) of country j in the year 2008, n_{j2008} is ln(number of employees) in 2008, and Λ denotes the logistic cumulative distribution function (CDF).[7] The year 2008 is chosen because it is the midpoint between 1999 and 2017. The fixed effects, α_h, are dummies for each of the regions with incomplete data (Asia and the Pacific, Latin America and the Caribbean, Arab States, Africa), while the two remaining regions with complete data form the omitted benchmark category. The logistic regression had a universe of $N = 188$ cases and produced a pseudo $R^2 = 0.401$. The estimated parameters were then used to calculate the propensity of response of country j, φ_j.

The response weight for country y j, φ_j, is then given by the inverse of a country's response propensity:

$$\varphi_j=\frac{1}{\phi_j} \tag{4}$$

Calibration factors

The final adjustment process, generally called calibration (Särndal and Deville, 1992), is undertaken to ensure consistency of the estimate with known aggregates. This procedure ensures appropriate representation of the different regions in the final global estimate. In the present context, a single variable "number of employees", n, in a given year t was considered for calibration. In this simple case, the calibration factors, γ_{jt}, are given by

$$\gamma_{jt}=\frac{n_{ht}}{\hat{n}_{ht}}, j\in h \tag{5}$$

6. An alternative specification with GDP per capita and population size produced very similar results.

7. Data for the number of persons employed and the number of employees are from KILM (ILO, 2017), and data on GDP in 2011 US$PPP from the World Bank's World Development Indicators.

where h represents the region to which country j belongs, n_{ht} is the known number of employees in that region in year t, and $\hat{n}_{ht}$ is an estimate of total number of employees in the region and the same year, obtained as a sum product of the uncalibrated weights and the employment data from the responding countries within each region.[8]

The resulting calibration factors for the year 2017 were 1.00 (Europe and Central Asia), 0.99 (Asia and the Pacific), 1.01 (Americas), 0.97 (Africa) and 1.10 (Arab States). Since all calibration factors are either equal to or very close to 1, these results show that estimates $\hat{n}_{ht}$ were already very close to the known number of employees, n_{ht}, in each region. Note that the calibration process was repeated for each year so that the weight of each region in the global estimate changes over time in proportion to its approximate share in the global wage bill.

Calibrated response weights

The calibrated response weights, φ'_{jt}, are then obtained by multiplying the initial response weight with the calibration factor:

$$\varphi'_{jt} = \varphi_j \times \gamma_{jt} \tag{6}$$

The regional estimate of the number of employees based on the calibrated response weights is equal to the known total number of employees in that region in a given year. Thus, the calibrated response weights adjust for differences in non-response between regions. The calibrated response weights are equal to 1 in the regions where wage data were available for all countries (Europe and Central Asia). They are larger than 1 for small countries and countries with lower labour productivity since these are under-represented among responding countries.

Estimating global and regional trends

One intuitive way to think of a global (or regional) wage trend is in terms of the evolution of the world's (or a region's) average wage. This would be in line with the concept used for other well-known estimates, such as regional GDP per capita growth (published by the World Bank) or the change in labour productivity (or GDP per person employed).

The global average wage, $\bar{y}_t$, at the point in time t can be obtained by dividing the sum of the national wage bills by the global number of employees:

$$\bar{y}_t = \frac{\sum_j n_{jt} \times \bar{y}_{jt}}{\sum_j n_{jt}} \tag{7}$$

where n_{jt} is the number of employees in country j and $\bar{y}_{jt}$ is the corresponding average wage of employees in country j, both at time t.

8. The estimate, $\hat{n}_h$, of the number of employees in region h is obtained by multiplying the number of employees in countries from the region for which we have wage data with the uncalibrated weights, and then summing up across the region.

The same can be repeated for the preceding time period t+1 to obtain $\bar{y}^*_{t+1}$, using the deflated wages $\bar{y}^*_{jt+1}$ and the number of employees n_{t+1}. It is then straightforward to calculate the growth rate of the global average wage, r.

However, while this is a conceptually appealing way to estimate global wage trends, it involves some difficulties that we cannot at present overcome. In particular, aggregating national wages, as done in equation (7), requires them to be converted into a common currency, such as US$PPP. This conversion would make the estimates sensitive to revisions in PPP conversion factors. It would also require that national wage statistics be harmonized to a single concept of wages in order to make the level strictly comparable.[9]

More importantly, the change in the global average wage would also be influenced by composition effects that occur when the share of employees shifts between countries. For instance, if the number of paid employees falls in a country with high wages but expands (or stays constant) in a country of similar size with low wages, this would result in a fall of the global average wage (when wage levels stay constant in all countries). This effect makes changes in the global average wage difficult to interpret, as one would have to differentiate which part is due to changes in national average wages and which part is due to composition effects.

We therefore gave preference to an alternative specification to calculate global wage trends that maintains the intuitive appeal of the concept presented above but avoids its practical challenges. To ease interpretation, we also want to exclude effects that are due to changes in the composition of the world's employee population. We therefore avoid the danger of producing a statistical artefact of falling global average wages that could be caused by a shift in employment to low-wage countries (even when wages within countries are actually growing).

When the number of employees in each country is held constant, the global wage growth rate can be expressed as a weighted average of the wage growth rates in the individual countries:

$$r_t = \sum_j w_{jt} \times r_{jt} \tag{8}$$

where r_{jt} is wage growth in country j at point in time t and the country weight, w_{jt}, is the share of country j in the global wage bill, as given by:

$$w_{jt} = n_{jt} \times \bar{y}_{jt} / \sum_j n_{jt} \times \bar{y}_{jt} \tag{9}$$

While we have data for the number of employees, n_{jt}, in all countries and relevant points in time from the ILO's Global Employment Trends Model, we cannot estimate equation (9) directly since our wage data are not in a common currency. However, we can again draw on standard economic theory which suggests that average wages vary roughly in line with labour productivity across countries.[10]

9. See, for example, the work done mainly for industrialized countries by the International Labor Comparisons programme of the US Bureau of Labor Statistics (see: http://www.bls.gov/fls/). Since we do not compare levels but focus on change over time in individual countries, data requirements are less demanding in our context.

10. See also ILO, 2008, p. 15, for the association between wage levels and GDP per capita. Notwithstanding this, wage developments can diverge from trends in labour productivity in the short and medium term.

We can thus estimate $\bar{y}_j$ as a fixed proportion of labour productivity, *LP*:

$$\hat{\bar{y}}_{jt} = \alpha \times LP_{jt} \tag{10}$$

where α is the average ratio of wages over labour productivity. We can therefore estimate the weight as

$$\hat{w}_{jt} = n_{jt} \times \alpha \times LP_{jt} / \sum_j n_{jt} \times \alpha \times LP_{jt} \tag{11}$$

which is equal to

$$\hat{w}_{jt} = n_{jt} \times LP_{jt} / \sum_j n_{jt} \times LP_{jt} \tag{12}$$

Substituting $\hat{w}_{jt}$ for w_{jt} and introducing the calibrated response weight, φ'_j, into equation (8) gives us the final equation used to estimate global wage growth:

$$r_t = \frac{\sum_j \varphi'_j \times \hat{w}_{jt} \times r_{jt}}{\sum_j \varphi'_j \times \hat{w}_{jt}} \tag{13}$$

and for regional wage growth:

$$r_{ht} = \frac{\sum_j \varphi'_j \times \hat{w}_{jt} \times r_{jt}}{\sum_j \varphi'_j \times \hat{w}_{jt}}, j \in h \tag{13'}$$

where *h* is the region to which country *j* belongs. As can be seen from equations (13) and (13'), global and regional wage growth rates are the weighted averages of the national wage trends, where φ'_j corrects for differences in response propensities between countries.

Differences in global and regional estimates between editions of the Global Wage Report

Since 2010, when the publication of regional and global wage growth estimates using the methodology outlined above began, there have been slight revisions to the historical estimates. While these revisions are relatively minor in some regions, such as Europe and Central Asia, and Asia and the Pacific, they are more frequent and sometimes substantial in others. The revisions to regional estimates can be explained by several factors, briefly highlighted here.

- **Improvements and revisions to surveys which collect wage data.** Improvements and revisions to existing wage data and surveys often occur. They may include a change in the geographical coverage (e.g. from urban to national), a change in sector coverage (e.g. from manufacturing to all sectors), a change in employee coverage (e.g. from full-time employees only to all employees), etc. To the extent that these changes influence the growth in wages they may also influence the regional estimate.
- **Exclusions.** In Latin America, Argentina (since the 2012/13 edition of the *Global Wage Report* (ILO, 2012)) has been excluded because it identified inconsistencies in its wage series until 2015. The Bolivarian Republic of Venezuela (since the 2016/17 edition) has been excluded for lack of consistent wage and inflation data.

- **Availability of new data from non-response and response countries.** Particularly in emerging and developing economies, there is often a lag in the process time for data and/or their public availability. When new or older series are made available, they are incorporated into the regional estimates.
- **Revision of other data sources used to calculate the estimates.** Over time, revisions to the CPI, total employment, total employees and labour productivity can also influence regional and country estimates.

Appendix II

Real and nominal wage growth, by region and country

Table A1 Country-specific nominal wage and real wage growth, 2013–17

Nominal wage

AFRICA	Currency	2013	2014	2015	2016	2017	Source
Algeria	DZD	36104	37826	39242	39901		Algeria National Statistical Office
Benin	XOF			46596			Institut National de la Statistique et de l'Analyse Economique
Botswana	BWP	5009					Central Statistical Office of Botswana
Burundi	BIF		108800				ILOSTAT
Central African Republic	XAF	149280	152867	161839	161060	176810	Institut Centrafricain des Statistiques et des Etudes Economiques et Sociales
Côte d'Ivoire	XOF	626361	646978	796620			Institut National de la Statistique
Egypt	EGP	3298	3493	3809	4082	4550	Egypt Central Agency for Public Mobilization and Statistics
Eswatini	SZL				4573		ILOSTAT
Ethiopia	ETB	1305					Central Statistic Agency of Ethiopia
Ghana	GHS			884			Ghana Statistical Service
Guinea	GNF	1158310					Ministère de l'Economie et des finances; Ministère de la fonction publique et réforme de l'administration
Kenya	KES	42886	46095	50749	53753	57008	Kenya National Bureau of Statistics
Lesotho	LSL	1590	1701	2145	1899	1988	Lesotho Bureau of Statistics
Madagascar	MGA			64500			National Statistical Institute of Madagascar
Malawi	MWK	13600					National Statistical Office of Malawi
Mali	XOF		72802	66809	78720		ILOSTAT
Mauritius	MUR	23785	24607	25368	26594	27574	Central Statistics Office of Mauritius
Morocco	MAD			4910	5032		Caisse Nationale de Sécurité Sociale du Maroc
Namibia	NAD	6843	6638		6927		ILOSTAT
Nigeria	NGN	39775	48413	45698	52215	50466	Nigeria National Bureau of Statistics
Rwanda	RWF				50923	57306	National Institute of Statistics of Rwanda

Table A1 (cont'd)

Nominal wage

AFRICA	Currency	2013	2014	2015	2016	2017	Source
Senegal	XOF				116476	156074	Ministère de l'Economie, des Finances et du Plan
Seychelles	SCR	8881					ILOSTAT
South Africa	ZAR	15070	15959	16957	18035	19571	Statistics South Africa
Tanzania, United Republic of	TZS	380553	400714	403729			Tanzania National Bureau of Statistics
Tunisia	TND	1287	1334	1389	1581		Tunisian National Institute of Statistics
Uganda	UGX	244506				387469	Uganda Bureau of Statistics
Zambia	ZMW		2344				Central Statistical Office of Zambia
Zimbabwe	USD			764			ILOSTAT

ARAB STATES	Currency	2013	2014	2015	2016	2017	Source
Bahrain	BHD	278	288	293	284	295	Kingdom of Bahrain Labour Market Regulatory Authority
Jordan	JOD	463		484	493		Jordan Department of Statistics
Kuwait	KWD	647	736	795	764		Kuwait Central Statistical Office
Occupied Palestinian Territory	ILS	1744	1805	1803	1855		Palestinian Central Bureau of Statistics
Oman	OMR	378	599	643	696	703	Oman Ministry of the National Economy
Qatar	QAR	9667	10483	10568	10793	11099	Qatar Statistics Authority
Saudi Arabia	SAR	5580	6099	6413			ILOSTAT

AMERICAS	Currency	2013	2014	2015	2016	2017	Source
Belize	BZD			1187	1186		ILOSTAT
Bolivia, Plurinational State of	BOB	2611	2712	2838	2985	3143	ILOSTAT
Brazil	BRL	1608	1728	1878	2004	2121	Brazilian Institute of Geography and Statistics (IBGE)
Canada	CAD	3949	4053	4126	4145	4229	Statistics Canada
Chile	CLP	471552		529048			ILOSTAT
Colombia	COP	1152113	1197101	1202560	1290862		ILO SIALC
Costa Rica	CRC	531926	568158	579249	613977	632926	Central Bank of Costa Rica
Cuba	CUP	471	584	687	740	767	Cuba National Office of Statistics
Dominican Republic	DOP	13538	13661	15309	17128		Oficina Nacional de Estadística
Ecuador	USD	573	586	613	613		ILO SIALC
El Salvador	USD	302	298	300	302	307	Ministry of the Economy and General Direction for Statistics and Census

Table A1 (cont'd)

Nominal wage

AMERICAS	Currency	2013	2014	2015	2016	2017	Source
Guatemala	GTQ	2026	2184	2186	2215	2193	Guatemala National Institute of Statistics
Honduras	HNL	6577	6577	6403	6918	6799	Honduras National Statistical Institute
Jamaica	JMD	81408	82740	83784			Statistical Institute of Jamaica
Mexico	MXN	6406	6376	6580	6852	7120	Mexico National Employment Service Job Portal
Nicaragua	NIO	7463	8147	8714	9292	10239	Ministry of Labour of Nicaragua (MITRAB)
Panama	PAB	987	1042	1115	1238		Panama National Institute of Statistics and Census
Paraguay	PYG	2276175	2360196	2478812	2449650		ILO SIALC
Peru	PEN	1312	1388	1432	1534		ILO SIALC
Puerto Rico	USD	2240	2258	2288	2284	2298	US Bureau of Labor Statistics
Trinidad and Tobago	TTD	5139	5434	5561	5758		ILOSTAT
United States	USD	3575	3661	3745	3818	3926	US Bureau of Labor Statistics
Uruguay	UYU	20774	23540	25887	28128		ILO SIALC

ASIA AND THE PACIFIC	Currency	2013	2014	2015	2016	2017	Source
Australia	AUD	4808	4879	4946	5036	5136	Australian Bureau of Statistics
Bangladesh	BDT				12915	12016	Bangladesh Bureau of Statistics
Brunei Darussalam	BND		2092				ILOSTAT
Cambodia	KHR	505186	642000	788000	887,000		National Institute of Statistics
China	CNY	4290	4697	5169	5631	6193	National Bureau of Statistics China
Fiji	FJD				1118		ILOSTAT
Hong Kong (China)	HKD	13807	14240	14848	15271	15703	Census and Statistics Department of Hong Kong
India	INR	9194	10093	10885	11674		Government of India Ministry of Statistics and Programme Implementation
Indonesia	IDR	1917152	1952589	2069306	2552962	2742621	Statistics Indonesia of the Republic of Indonesia
Iran, Islamic Republic of	IRR	5110000	6494583	7769333			Statistical Centre of Iran
Japan	JPY	324000	329600	333300	333700	333800	Japan Ministry of Health, Labour and Welfare
Korea, Republic of	KRW	3110992	3189995	3300091	3424726	3518155	Ministry of Labour of Korea
Lao People's Democratic Republic	LAK					2354377	ILOSTAT

Table A1 (cont'd)

Nominal wage

ASIA AND THE PACIFIC	Currency	2013	2014	2015	2016	2017	Source
Macau (China)	MOP	12145	13145	13805	14150	14580	Statistics and Census Service Macao SAR Government
Malaysia	MYR	2659	2775	2947	3112	3300	Department of Statistics of Malaysia
Mongolia	MNT		796600	808000	861900	944500	Mongolia National Statistical Office
Myanmar	MMK			124157		181917	Ministry of Labour, Employment and Social Security
New Zealand	NZD	4169	4294	4424	4645	4784	Statistics New Zealand
Pakistan	PKR	12118	13155	14971			Government of Pakistan Statistics Division
Philippines	PHP	9107	9582	9876	10458		National Statistical Office of the Philippines
Singapore	SGD	4622	4727	4892	5074	5229	Statistics Singapore
Sri Lanka	LKR		24346	28739	31782		Department of Census and Statistics
Taiwan (China)	TWD	45664	47300	48490	48790	49989	National Statistics Republic of China (Taiwan)
Thailand	THB	12003	13244	13487	13729		National Statistical Office of Thailand
Timor-Leste	USD	711					National Directorate of Statistics of Timor-Leste
Viet Nam	VND	4120000	4475000	4656000	4985000	5370500	General Statistics Office of Viet Nam

EUROPE AND CENTRAL ASIA	Currency	2013	2014	2015	2016	2017	Source
Albania	ALL	36993	37323	38148	37341		Albania National Institute of Statistics
Armenia	AMD	146524	158580	171615	174445	195074	National Statistics Service of Armenia
Austria	EUR	4080	4190	4280	4390	4420	Statistics Austria
Azerbaijan	AZN	425	445	467	500	528	State Statistical Committee of the Republic of Azerbaijan
Belarus	BYN	506	605	671	723	815	Republic of Belarus Official Statistics
Belgium	EUR	2974	3079	3082	3091		Belgian Statistical Office
Bosnia and Herzegovina	BAM	1291	1290	1289	1301	1321	Agency of Statistics for Bosnia and Herzegovina
Bulgaria	BGN	775	822	878	948	1060	Bulgarian National Statistical Institute
Croatia	HRK	7926	7951	7978	8037		Republic of Croatia Central Bureau of Statistics
Cyprus	EUR	1945	1892	1882	1879	1892	Statistical Service of Cyprus
Czech Republic	CZK	26211	26802	27811	29061	31109	Czech Statistical Office
Denmark	DKK	38525	38958	39575	40102	40954	Statistics Denmark

Table A1 (cont'd)

Nominal wage

EUROPE AND CENTRAL ASIA	Currency	2013	2014	2015	2016	2017	Source
Estonia	EUR	949	1005	1065	1146	1221	Statistics Estonia
Finland	EUR	3284	3308	3333	3368	3395	Statistics Finland
France	EUR	2830	2864	2928			INSEE – National Institute of Statistics and Economic Studies
Georgia	GEL	773	818	900	940	999	National Statistics Office of Georgia
Germany	EUR	2564	2636	2709	2775	2849	Federal Statistical Office of Germany
Greece	EUR	1406	1389	1357	1344	1346	Eurostat
Hungary	HUF	230 714	237 695	247 924	263 171	297 017	Hungarian Central Statistics Office
Iceland	ISK	398 000	412 000	441 000	488 000		Statistics Iceland
Ireland	EUR	2998	3008	3043	3077	3137	Central Statistics Office of Ireland
Israel	ILS	9030	9317	9503	9724		Israel Central Bureau of Statistics
Italy	EUR	2140	2148	2176	2191	2194	Italy National Bureau of Statistics
Kazakhstan	KZT	109 141	121 021	126 021	142 898	150 827	Agency of Statistics of Kazakhstan
Kyrgyzstan	KGS	11 341	12 285	13 483	14 847	15 670	National Statistical Committee of the Kyrgyz Republic
Latvia	EUR	716	765	818	859	926	Statistics Latvia
Lithuania	EUR	646	677	714	774	840	Statistics Lithuania
Luxembourg	EUR	4455	4577	4727	4772	4919	STATEC Luxembourg
Malta	EUR	1321	1341	1380	1438	1497	Malta National Statistics Office
Moldova, Republic of	MDL	3674	4090	4538	4998	5587	National Bureau of Statistics Moldova
Montenegro	EUR	726	723	725	751	765	Statistical Office of Montenegro
Netherlands	EUR	2337	2359	2405	2436	2460	Statistics Netherlands
Norway	NOK	41 000	42 300	42 600	43 300	44 310	Statistics Norway
Poland	PLN	3659	3777	3908	4052	4272	Central Statistical Office of Poland
Portugal	EUR	881	878	884	895	913	Ministry of Labour, Solidarity and Social Security
Romania	RON	2163	2328	2555	2809	3223	Romanian National Institute of Statistics
Russian Federation	RUB	29 792	32 495	34 030	36 709	39 144	Russia Federal State Statistics Service
Serbia	RSD	60 708	61 426	61 145	63 474	65 976	Statistical Office of the Republic of Serbia
Slovakia	EUR	824	858	883	912	954	Statistical Office of the Slovak Republic
Slovenia	EUR	1523	1546	1556	1585	1627	Statistical Office of the Republic of Slovenia

Table A1 (cont'd)

Nominal wage

EUROPE AND CENTRAL ASIA	Currency	2013	2014	2015	2016	2017	Source
Spain	EUR	1884	1882	1902	1898	1900	Spain National Statistics Institute
Sweden	SEK	30600	31400	32000	32800	33700	Statistics Sweden
Switzerland	CHF		7308		7491		Swiss Federal Statistical Office
Tajikistan	TJS	695	816	879	962		State Committee on Statistics of Tajikistan
The former Yugoslav Republic of Macedonia	MKD	31025	31325	32173	32822	33688	Republic of Macedonia State Statistical Office
Turkey	TRY		2207				Turkish Statistical Institute
Turkmenistan	TMT	1047	1153	1263	1381	1403	State Committee of Turkmenistan Statistics
Ukraine	UAH	3282	3480	4195	5183	7104	State Committee of Statistics of Ukraine
United Kingdom	GBP	2172	2173	2198	2275	2334	United Kingdom National Statistics
Uzbekistan	UZS				1293800	1453200	State Committee of the Republic of Uzbekistan on Statistics

Table A1 (cont'd)

Real wage

AFRICA	2013	2014	2015	2016	2017
Algeria	10.1	1.8	–1.0	–4.4	
Benin	2.1	2.1	2.1		
Botswana	–1.6				
Central African Republic	–5.2	–8.2	1.3	–4.9	5.5
Côte d'Ivoire	0.4	2.8	21.6		
Egypt	11.0	–3.8	–1.7	–2.8	–9.8
Ethiopia	–0.6				
Ghana	15.2				
Guinea	6.5				
Kenya	10.7	0.1	2.9	0.1	–2.9
Lesotho	3.3	2.3	20.9	–16.6	–0.6
Madagascar	–1.1	–1.1	–1.1		
Malawi	–8.4	6.1	4.9		
Mali			–9.5	20	
Mauritius	8.9	0.2	1.8	3.8	0
Morocco	0.3	1.7	1.5	0.8	
Mozambique	4.5	17.9	14.0	–0.6	–4.0
Namibia	15.2	–7.9	–2.8	–2.8	
Nigeria	–1.3	12.7	–13.4	–1.2	–17.0
Rwanda					7.3
Senegal					32.3
South Africa	0	–0.3	2.1	–0.1	3.1
Tanzania, United Republic of	–1.1	–0.8	–4.6		
Tunisia	0.1	0.5	1.5	2.4	1.3
Uganda	–11.1	21.2	16.2	1.4	–8.3
Zambia	9.6	9.6			
Zimbabwe	11.6	–10.6	5.9		

ARAB STATES	2013	2014	2015	2016	2017
Bahrain	–4.4	1.0	0.1	–5.9	2.5
Jordan	1.1	1.2	1.2	2.7	
Kuwait	–7.1	10.2	4.2	–7.1	–0.6
Occupied Palestinian Territory	–0.8	1.7	–1.5	3.1	3.9
Oman	6.7	56.9	7.3	7.1	–0.6
Qatar	8.2	4.9	–1.0	–0.5	2.4
Saudi Arabia	5.6	9.3	5.2		

Table A1 (cont'd)

Real wage

AMERICAS	2013	2014	2015	2016	2017
Belize				–0.7	
Bolivia, Plurinational State of	1.1	1.6	0.6	1.5	2.4
Brazil	3.3	1.1	–0.3	–1.9	2.3
Canada	0.8	0.7	0.7	–0.9	0.4
Chile	3.9	1.8	1.8	1.4	3.1
Colombia	2.6	0.5	1.2	–1.1	1.8
Costa Rica	1.6	2.2	1.1	6.0	1.5
Dominican Republic	1.1	–2.0	11.1	10.1	
Ecuador	8.8	–1.3	0.7	–1.7	
El Salvador	7.6	–2.4	1.4	0.1	0.5
Guatemala	3.3	4.2	–2.2	–2.9	–5.2
Honduras	2.4	2.4	–0.4	–0.4	–5.4
Jamaica	–5.3	–6.1	–2.3		
Mexico	–0.6	–4.3	0.5	1.3	–2.0
Nicaragua	–0.4	3.0	2.8	3.0	4.7
Panama	16.1	2.9	6.9	10.1	6.1
Paraguay	2.3	0.2	1.3	0.9	0.4
Peru	0.4	4.4	–1.6	0.8	–0.2
Puerto Rico	–1.2	0.2	2.1	0.1	–1.1
Trinidad and Tobago	–1.9	0	–2.2	0.5	
United States*	0.4	0.8	2.2	0.7	0.7
Uruguay	3.0	3.4	1.6	1.6	2.9

* United States numbers are based on BLS CEU0500000012.

ASIA AND THE PACIFIC	2013	2014	2015	2016	2017
Australia	1.5	–1.0	–0.1	0.6	0
Bangladesh	6.2	2.4	3.5	3.6	3.0
Cambodia	21.9	22.4	21.3	9.3	
China	9.0	6.0	6.7	5.5	5.6
Hong Kong (China)	–0.2	–1.2	1.2	0.4	1.3
India	5.2	5.7	5.4		
Indonesia	10.1	–4.3	–0.4	19.2	3.5
Iran, Islamic Republic of	–4.7	13.7	7.5		
Japan	–0.8	–1.0	0.3	0.2	–0.4
Korea, Republic of	2.5	1.2	2.7	2.8	0.8
Macau (China)	1.6	2.1	0.4	0.1	1.8
Malaysia	4.7	1.2	4.0	3.4	2.2
Mongolia	7.9	7.9	–4.2	6.2	4.7
Myanmar				14.9	14.9
Nepal	–0.2	–3.1	0.7	0.9	5.0
New Zealand	3.2	1.8	2.7	4.3	1.1
Pakistan	2.3	–0.1	8.9		
Philippines	2.0	1.6	2.4	4.6	
Singapore	1.9	1.2	4.0	4.3	2.5
Sri Lanka	10.8	16.3	15.5	6.3	
Taiwan (China)	–0.6	2.4	2.8	–0.8	1.8
Thailand	5.8	8.3	2.8	1.6	
Timor-Leste	43.8				
Viet Nam	2.9	4.3	4.8	4.3	4.1

Table A1 (cont'd)

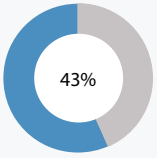
Real wage

EUROPE AND CENTRAL ASIA	2013	2014	2015	2016	2017
Albania	–3.8	–0.7	0.3	–3.3	
Armenia	1.0	11.2	7.5	6.9	11.8
Austria	0.1	1.2	1.3	1.6	–1.5
Azerbaijan	4.2	3.2	1.0	–4.8	–6.4
Belarus	16.4	1.3	–2.3	–3.8	6.2
Belgium	–0.6	3.0	–0.5	–1.5	–0.3
Bosnia and Herzegovina	0.2	0.8	1.0	2.1	0.3
Bulgaria	5.6	7.7	8.0	9.5	10.5
Croatia	–1.4	0.5	0.8	1.8	3.9
Cyprus	–1.8	–1.3	1.6	1.2	0.2
Czech Republic	–0.7	1.9	3.4	3.8	4.5
Denmark	0.3	0.6	1.1	1.1	1.0
Estonia	3.6	5.4	5.9	6.8	2.8
Finland	0.2	–0.5	0.9	0.7	0
France	2.1	0.6	2.1	0.8	0.1
Georgia	9.1	2.7	5.8	2.2	0.2
Germany	0.5	2.0	2.6	2.1	0.9
Greece	–9.3	1.9	0.2	1.3	–3.5
Hungary	1.7	3.2	4.4	5.7	10.3
Iceland	4.9	3.1	7.5	7.0	6.3
Ireland	–1.0	0	1.2	1.3	1.7
Israel	1.4	2.7	2.6	2.9	3.0
Italy	–0.3	0.2	1.2	0.7	–1.2
Kazakhstan	1.6	3.9	–2.4	–0.9	–2.1
Kyrgyzstan	–0.8	0.7	3.1	9.7	2.3
Latvia	4.5	6.1	6.7	4.9	4.8

EUROPE AND CENTRAL ASIA	2013	2014	2015	2016	2017
Lithuania	4.5	4.6	6.1	7.6	4.7
Luxembourg	0.6	2.1	2.8	0.7	1.4
Malta	1.0	0.7	1.7	3.3	2.8
Moldova, Republic of	3.7	5.9	1.0	3.0	4.9
Montenegro	–2.3	0.3	–1.3	3.9	–0.5
Netherlands	–1.0	0.6	1.7	1.2	–0.3
Norway	1.4	1.1	–1.4	–1.8	0.4
Poland	2.7	3.3	4.4	4.3	3.4
Portugal	-0.3	-0.3	0.3	0.6	0.4
Romania	0.8	6.4	10.2	11.8	12.8
Russian Federation	4.8	1.2	–9.4	0.8	2.9
Serbia	–1.9	–1.7	–2.4	–1.7	0.9
Slovakia	1.0	4.2	3.2	3.8	4.1
Slovenia	–2.0	0.9	1.2	1.9	1.3
Spain	–1.4	0	1.6	–0.1	–1.8
Sweden	2.5	2.8	2.0	1.5	1.1
Switzerland	1.0	0.8	1.5	1.1	–0.1
Tajikistan	19.1	10.7	7.7		
The former Yugoslav Republic of Macedonia	–1.6	1.3	3.0	2.3	1.3
Turkey	6.4	6.1	5.6	7.6	1.2
Turkmenistan	3.9	3.8	2.0	5.4	-5.9
Ukraine	8.2	–6.5	–20.2	9.0	19.1
United Kingdom	–0.5	–1.4	1.1	2.8	–0.1
Uzbekistan					–0.2

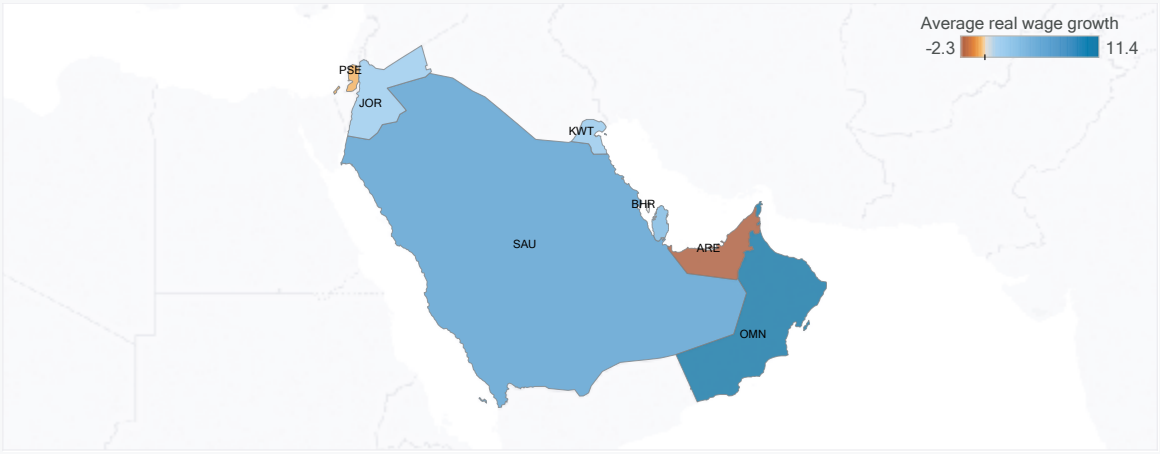
Figure A2 Real wage growth, by region and country, 2008–17

ARAB STATES

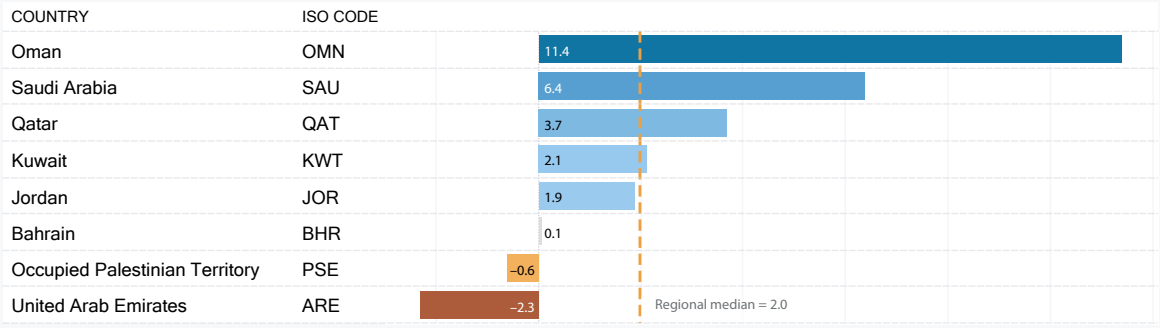


Real wage growth increase in the past ten years (2008-17) in Arab States

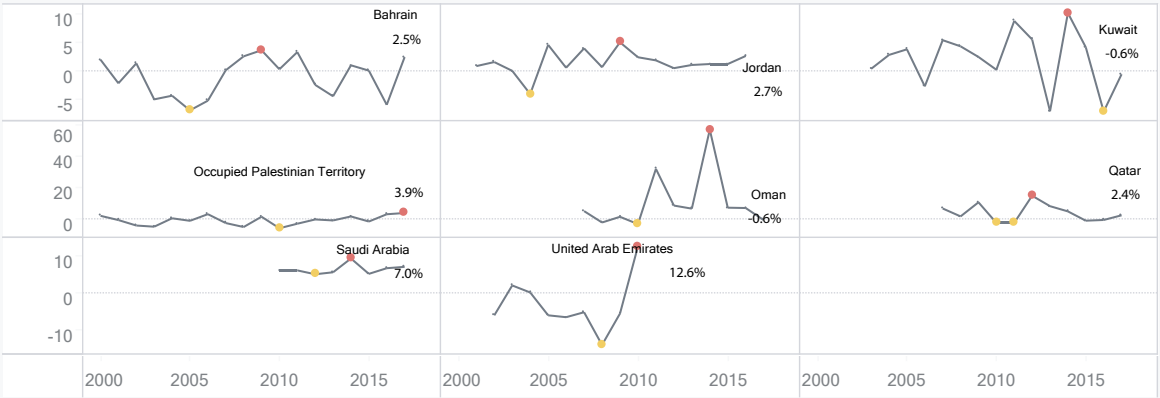
Average real wage growth in Arab States, 2008-17



Average real wage growth in Arab States by country, 2008-17



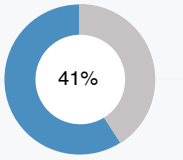
Annual real wage growth in Arab States by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

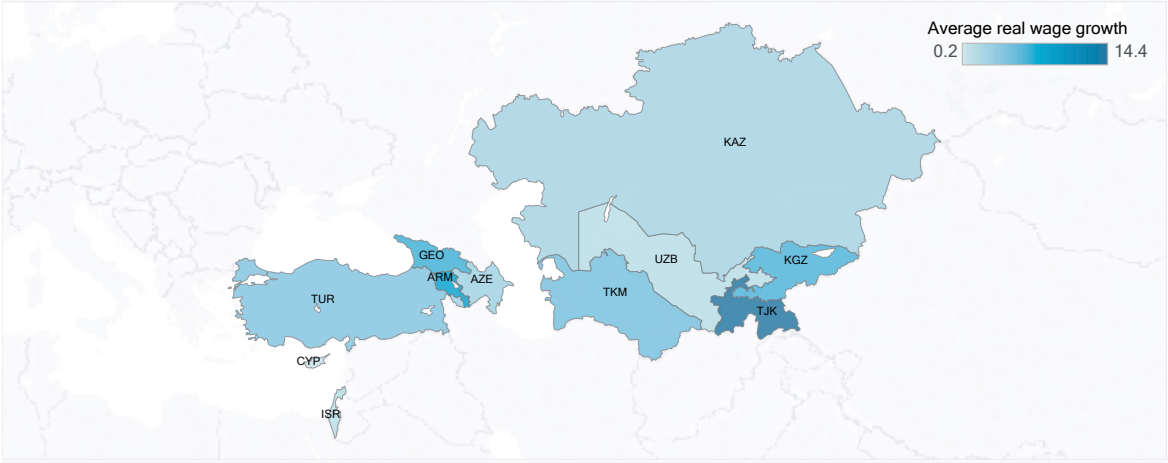
Figure A2 (cont'd)

CENTRAL AND WESTERN ASIA

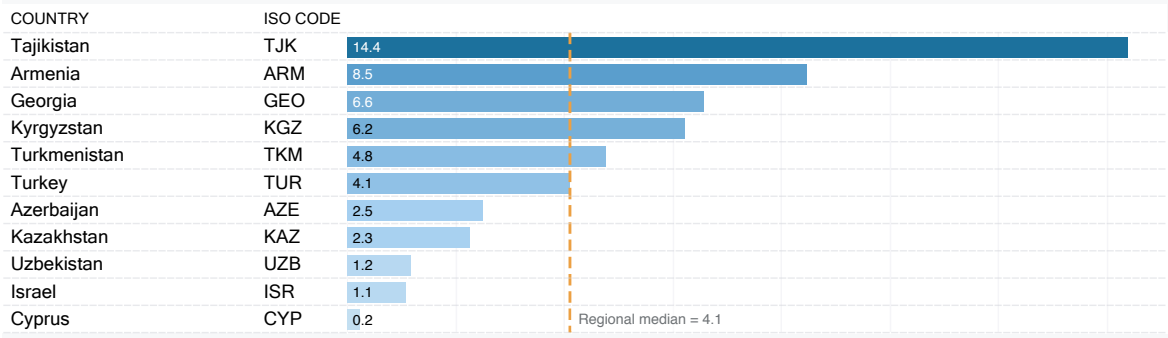


Real wage growth increase in the past ten years (2008-17) in Central and Western Asia

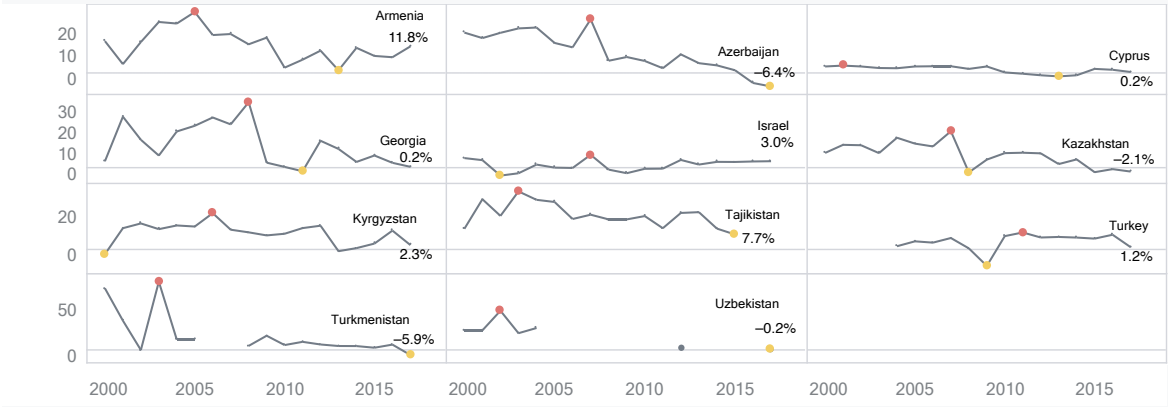
Average real wage growth in Central and Western Asia, 2008-17



Average real wage growth in Central and Western Asia by country, 2008-17



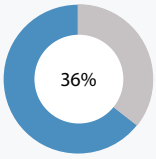
Annual real wage growth in Central and Western Asia by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

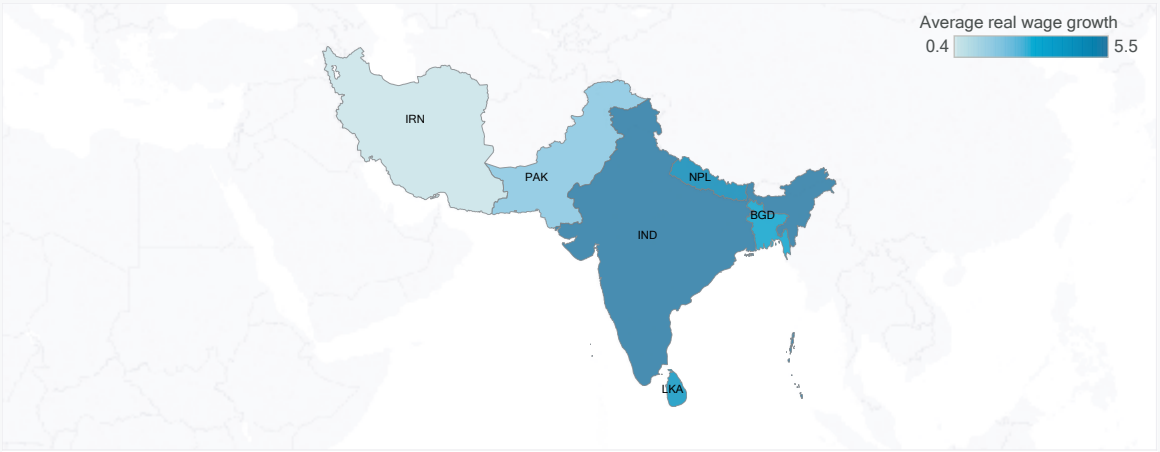
Figure A2 (cont'd)

SOUTHERN ASIA

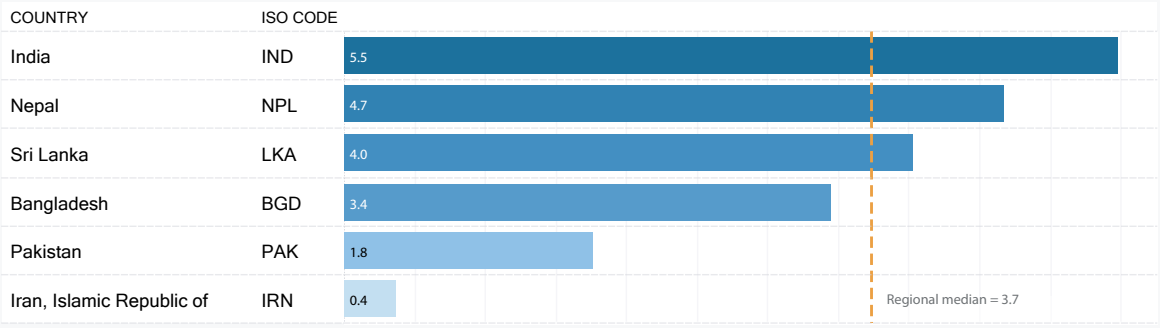


Real wage growth increase in the past ten years (2008-17) in Southern Asia

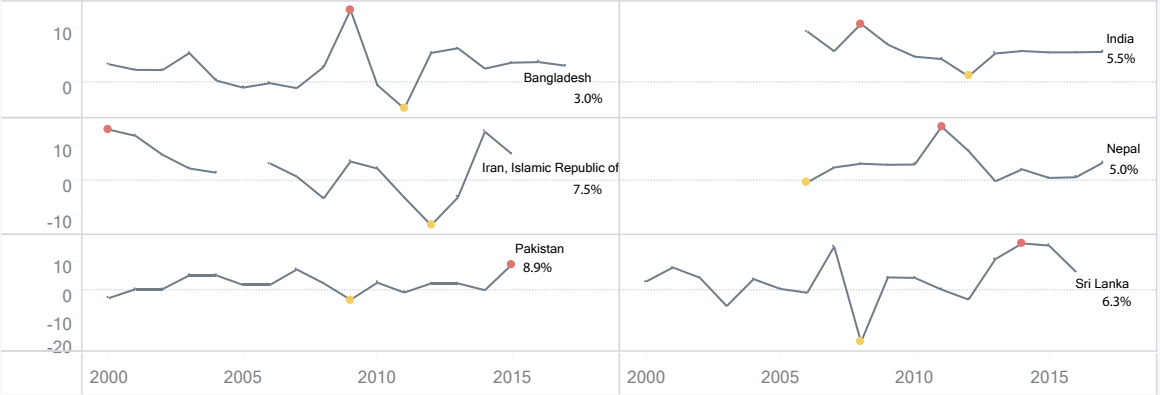
Average real wage growth in Southern Asia, 2008-17



Average real wage growth in Southern Asia by country, 2008-17



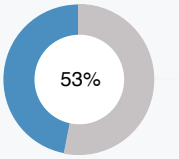
Annual real wage growth in Southern Asia by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

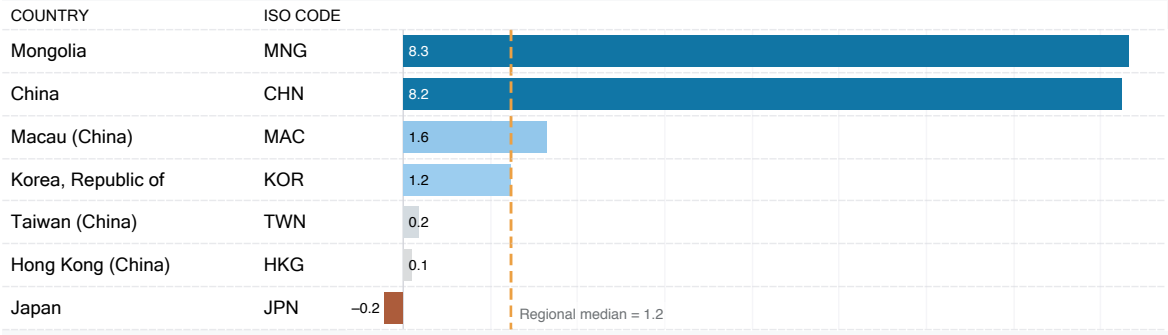
EASTERN ASIA



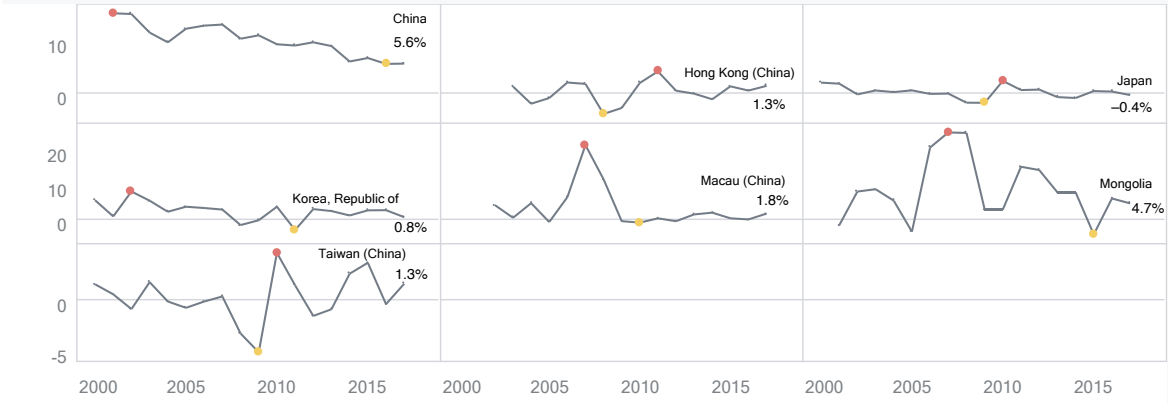
Real wage growth increase in the past ten years (2008-17) in Eastern Asia

Average real wage growth in Eastern Asia, 2008-17

Average real wage growth in Eastern Asia by country, 2008-17



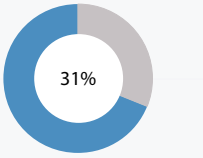
Annual real wage growth in Eastern Asia by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

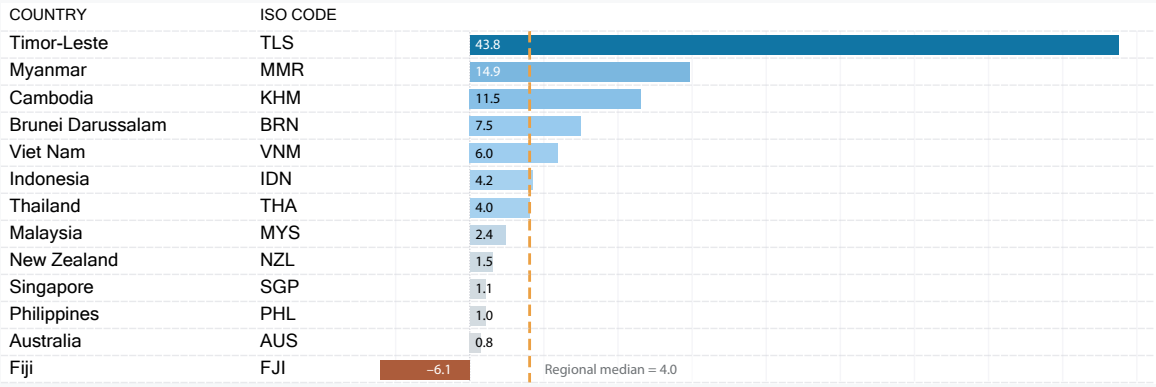
SOUTH-EASTERN ASIA AND THE PACIFIC



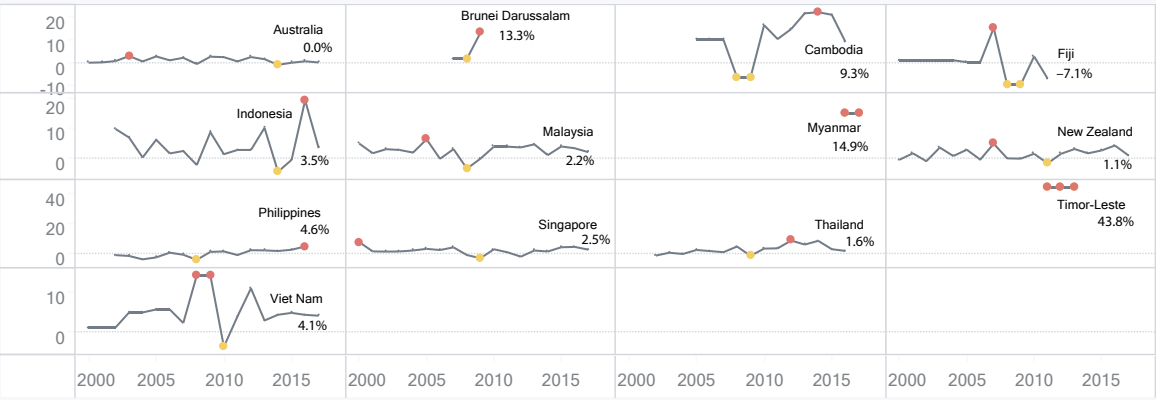
Real wage growth increase
in the past ten years (2008-17)
in South-Eastern Asia and the Pacific

Average real wage growth in South-Eastern Asia and the Pacific, 2008-17

Average real wage growth in South-Eastern Asia and the Pacific by country, 2008-17



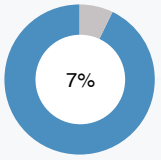
Annual real wage growth in South-Eastern Asia and the Pacific by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

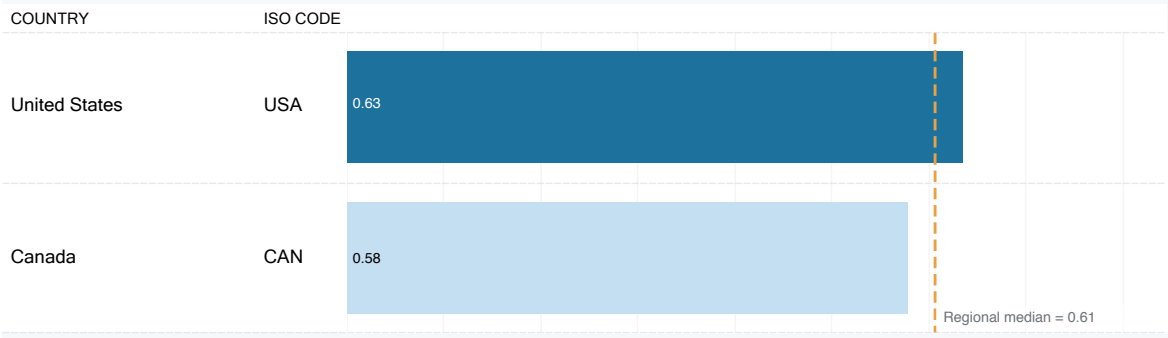
NORTHERN AMERICA



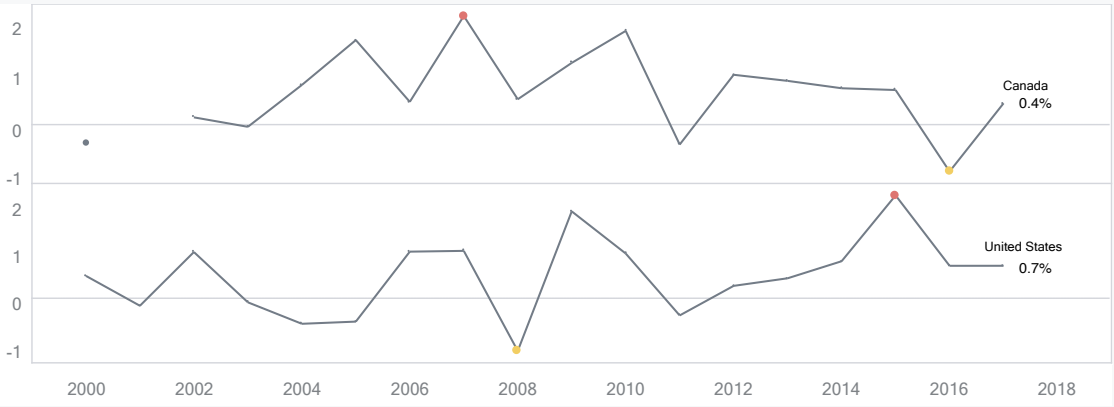
Real wage growth increase in the past ten years (2008-17) in Northern America

Average real wage growth in Northern America, 2008-17

Average real wage growth in Northern America by country, 2008-17



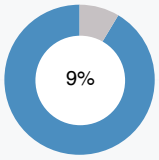
Annual real wage growth in Northern America by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

LATIN AMERICA AND THE CARIBBEAN



Real wage growth increase
in the past ten years (2008-17)
in Latin America and the Caribbean

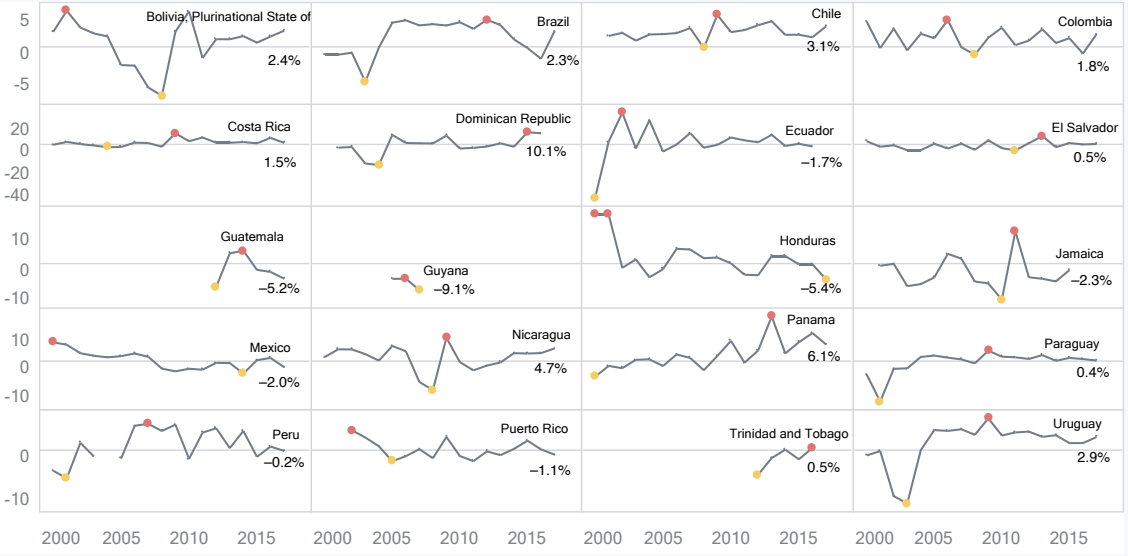
Average real wage growth in Latin America and the Caribbean by country, 2008-17

COUNTRY	ISO CODE	
Panama	PAN	5.2
Uruguay	URY	3.5
Costa Rica	CRI	3.1
Chile	CHL	2.4
Dominican Republic	DOM	2.3
Brazil	BRA	2.2
Peru	PER	2.1
Ecuador	ECU	1.7
Paraguay	PRY	1.2
Colombia	COL	0.9
Nicaragua	NIC	0.6
Bolivia, Plurinational State of	BOL	0.6
El Salvador	SLV	–0.1
Puerto Rico	PRI	–0.3
Honduras	HND	–0.6
Mexico	MEX	–1.7
Guatemala	GTM	–1.8
Trinidad and Tobago	TTO	–1.9
Jamaica	JAM	–4.1

Regional median = 0.9

Average real wage growth in Latin America and the Caribbean, 2008-17

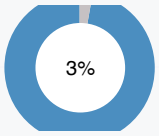
Annual real wage growth in Latin America and the Caribbean by country, 2000 -17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

NORTHERN, SOUTHERN AND WESTERN EUROPE



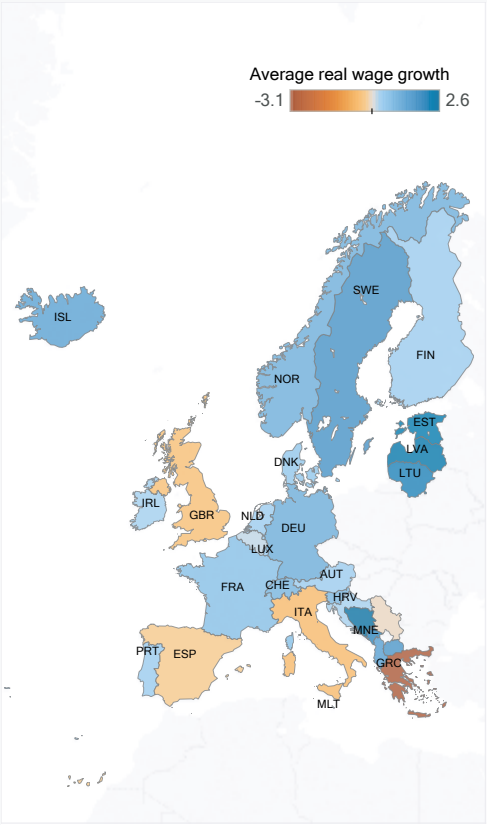
Real wage growth increase
in the past ten years (2008-17)
in Northern, Southern and Western Europe

Average real wage growth in Northern, Southern and Western Europe by country, 2008-17

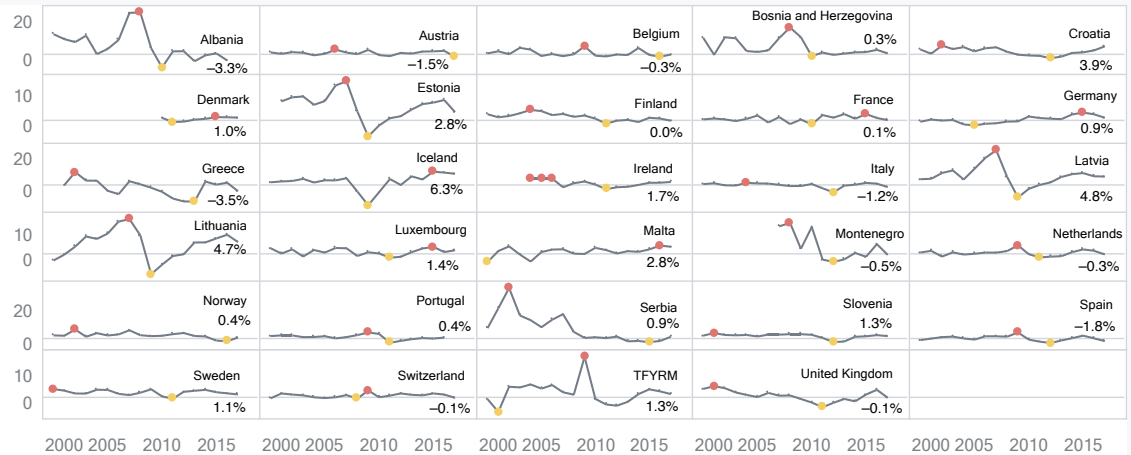
COUNTRY	ISO CODE	
Bosnia and Herzegovina	BIH	2.6
Latvia	LVA	2.4
Estonia	EST	2.3
Lithuania	LTU	2.1
Montenegro	MNE	2.0
Sweden	SWE	1.7
TFYRM	MKD	1.6
Albania	ALB	1.4
Malta	MLT	1.3
Iceland	ISL	1.3
Germany	DEU	1.0
Norway	NOR	1.0
Switzerland	CHE	0.9
Slovenia	SVN	0.8
France	FRA	0.7
Denmark	DNK	0.5
Luxembourg	LUX	0.4
Portugal	PRT	0.4
Finland	FIN	0.4
Netherlands	NLD	0.4
Austria	AUT	0.3
Ireland	IRL	0.3
Croatia	HRV	0.2
Belgium	BEL	0.1
Serbia	SRB	−0.1
Spain	ESP	−0.3
United Kingdom	GBR	−0.5
Italy	ITA	−0.6
Greece	GRC	−3.1

Regional median = 0.7

Average real wage growth in Northern, Southern and Western Europe, 2008-17



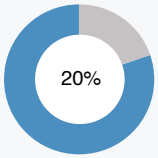
Annual real wage growth in Northern, Southern and Western Europe by country, 2000-17



Note: 1. Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.
2. TFYRM refers to "The former Yugoslav Republic of Macedonia".

Figure A2 (cont'd)

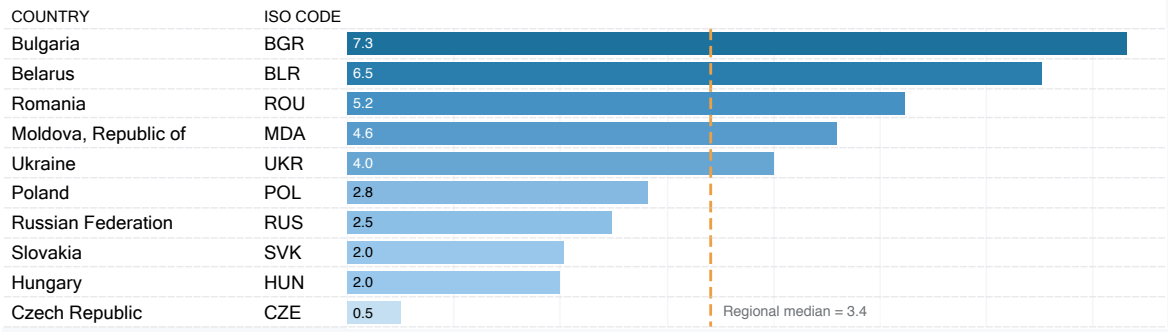
EASTERN EUROPE



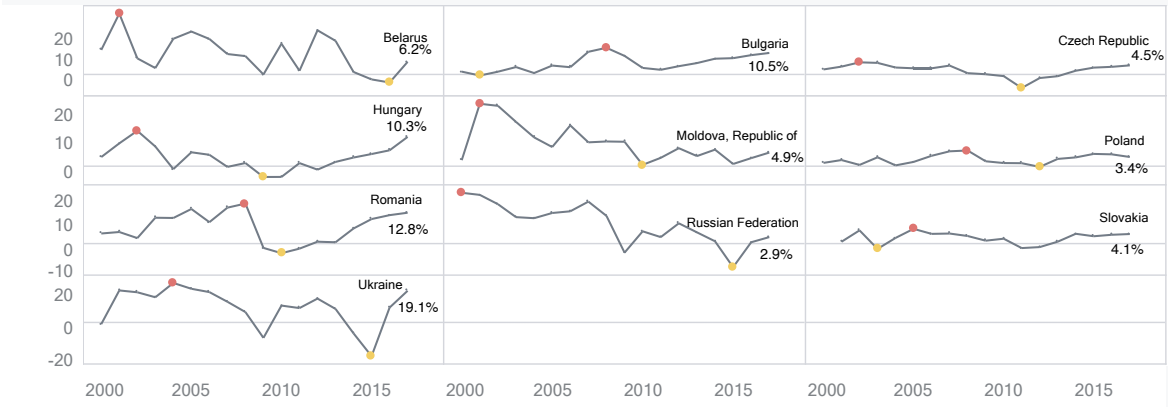
Real wage growth increase in the past ten years (2008-17) in Eastern Europe

Average real wage growth in Eastern Europe, 2008-17

Average real wage growth in Eastern Europe by country, 2008-17



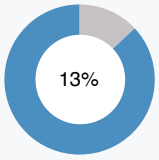
Annual real wage growth in Eastern Europe by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

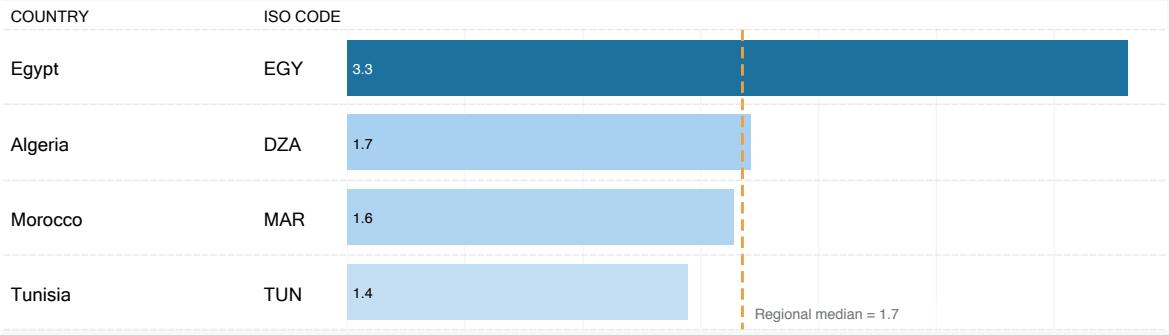
NORTHERN AFRICA



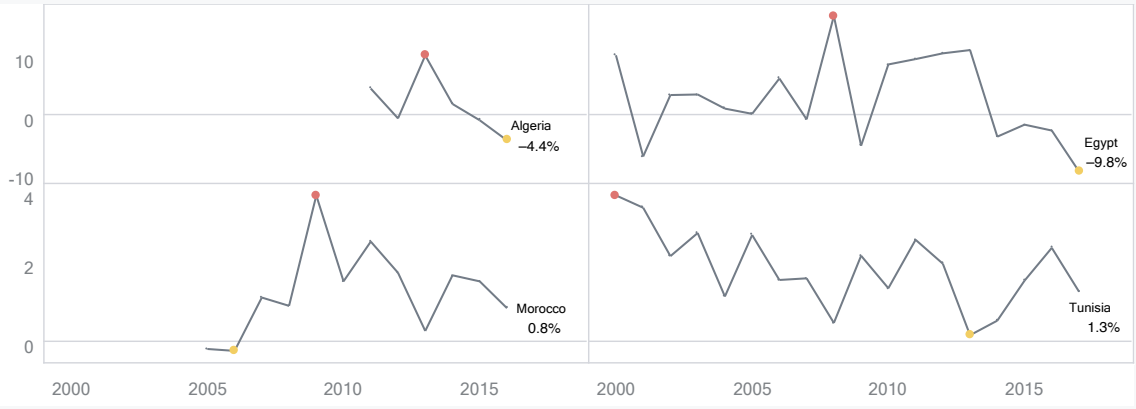
Real wage growth increase in the past ten years (2008-17) in Northern Africa

Average real wage growth in Northern Africa, 2008-17

Average real wage growth in Northern Africa by country, 2008-17



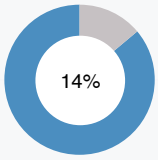
Annual real wage growth in Northern Africa by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Figure A2 (cont'd)

SUB-SAHARAN AFRICA



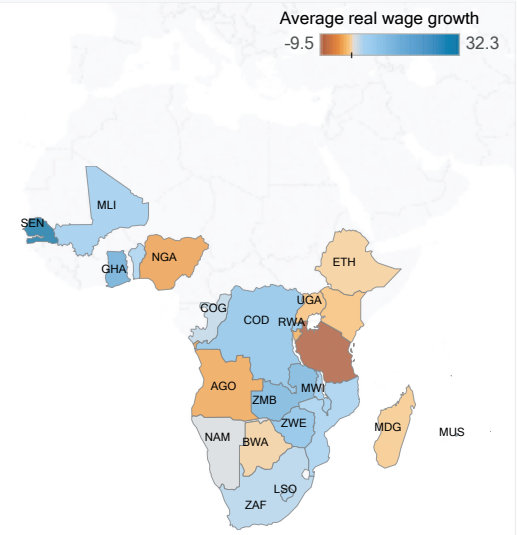
Real wage growth increase in the past ten years (2008-17) in Sub-Saharan Africa

Average real wage growth in Sub-Saharan Africa by country, 2008-17

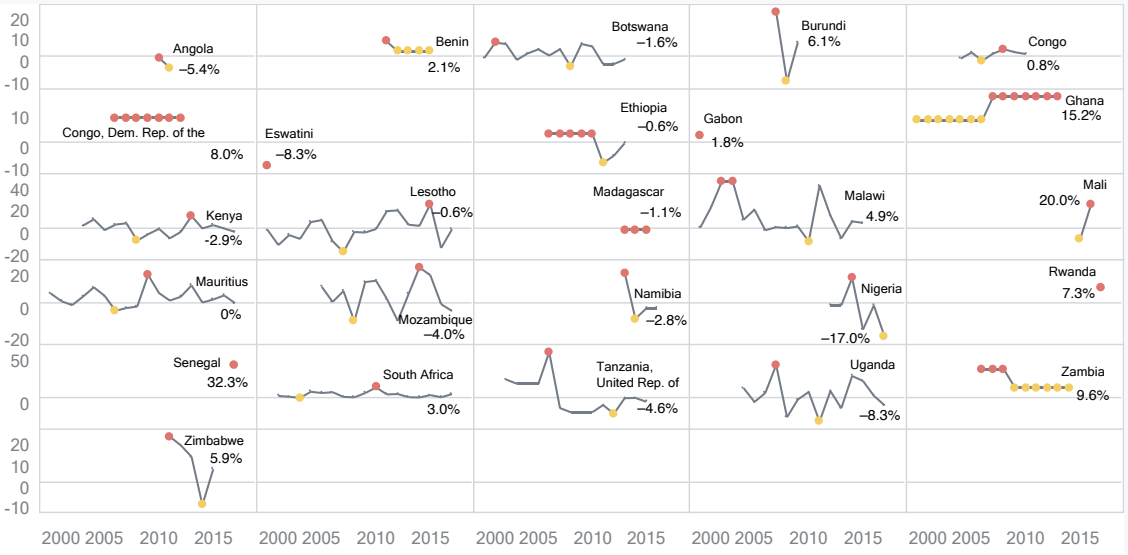
COUNTRY	ISO CODE	
Senegal	SEN	32.3
Ghana	GHA	15.2
Zambia	ZMB	12.1
Zimbabwe	ZWE	8.9
Congo, Dem. Rep. of the	COD	8.0
Rwanda	RWA	7.3
Mali	MLI	5.2
Malawi	MWI	5.2
Mozambique	MOZ	3.7
Mauritius	MUS	3.6
Lesotho	LSO	3.3
Benin	BEN	3.0
South Africa	ZAF	2.4
Congo	COG	1.8
Namibia	NAM	0.4
Botswana	BWA	−0.7
Ethiopia	ETH	−0.8
Madagascar	MDG	−1.1
Kenya	KEN	−1.6
Uganda	UGA	−1.6
Burundi	BDI	−2.7
Angola	AGO	−3.1
Nigeria	NGA	−3.6
Tanzania, United Rep. of	TZA	−9.5

Regional median = 2.7

Average real wage growth in Sub-Saharan Africa, 2008-17



Annual real wage growth in Sub-Saharan Africa by country, 2000-17



Note: Figure shows 2017 or latest available real wage growth rate; red dot ● highest real wage growth, yellow dot ● lowest real wage growth.

Appendix III

Country and territory groupings, by region and income level

Table A2 Country and territory groupings by region

Region	Subregion – broad	Countries
Africa	Northern Africa	Algeria, Egypt, Libya, Morocco, Sudan, Tunisia
	Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Réunion, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, United Republic of Tanzania, Togo, Uganda, Zambia, Zimbabwe
Americas	Latin America and the Caribbean	Argentina, Bahamas, Barbados, Belize, Plurinational State of Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Suriname, Trinidad and Tobago, Uruguay, Bolivarian Republic of Venezuela
	Northern America	Canada, United States
Arab States	Arab States	Bahrain, Iraq, Jordan, Kuwait, Lebanon, Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen
Asia and the Pacific	Eastern Asia	China, Hong Kong (China), Japan, Democratic People's Republic of Korea, Republic of Korea, Macau (China), Mongolia, Taiwan (China)
	South-Eastern Asia and the Pacific	Australia, Brunei, Cambodia, Fiji, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, New Zealand, Papua New Guinea, Philippines, Singapore, Solomon Islands, Thailand, Timor-Leste, Viet Nam
	Southern Asia	Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Republic of Maldives, Nepal, Pakistan, Sri Lanka
Europe and Central Asia	Northern, Southern and Western Europe	Albania, Austria, Belgium, Bosnia and Herzegovina, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Norway, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, United Kingdom
	Eastern Europe	Belarus, Bulgaria, Czech Republic, Hungary, Republic of Moldova, Poland, Romania, Russian Federation, Slovakia, Ukraine
	Central and Western Asia	Armenia, Azerbaijan, Cyprus, Georgia, Israel, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey, Turkmenistan, Uzbekistan

Table A3 Country and territory groupings by income level

Developed countries (high-income)	Emerging countries (upper-middle income)	Emerging countries (lower-middle income)	Developing countries (low-income)
Andorra	Albania	Angola	Afghanistan
Antigua and Barbuda	Algeria	Bangladesh	Benin
Argentina	Armenia	Bhutan	Burkina Faso
Australia	Azerbaijan	Bolivia, Plurinational State of	Burundi
Austria	Belarus	Cabo Verde	Central African Republic
Bahamas	Belize	Cambodia	Chad
Bahrain	Bosnia and Herzegovina	Cameroon	Comoros
Barbados	Botswana	Congo	Congo, Democratic Republic of the
Belgium	Brazil	Côte d'Ivoire	Eritrea
Brunei Darussalam	Bulgaria	Djibouti	Ethiopia
Canada	China	Egypt	The Gambia
Channel Islands	Colombia	El Salvador	Guinea
Chile	Cook Islands	Eswatini	Guinea-Bissau
Croatia	Costa Rica	Georgia	Haiti
Cyprus	Cuba	Ghana	Korea, Democratic People's Republic of
Czech Republic	Dominica	Honduras	Liberia
Denmark	Dominican Republic	India	Madagascar
Estonia	Ecuador	Indonesia	Malawi
Finland	Equatorial Guinea	Kenya	Mali
France	Fiji	Kiribati	Mozambique
French Guiana	Gabon	Kyrgyzstan	Nepal
French Polynesia	Grenada	Lao People's Democratic Republic	Niger
Germany	Guadeloupe	Lesotho	Rwanda
Greece	Guatemala	Mauritania	Senegal
Greenland	Guyana	Micronesia, Federated States of	Sierra Leone
Guam	Iran, Islamic Republic of	Moldova, Republic of	Somalia
Hong Kong (China)	Iraq	Mongolia	South Sudan
Hungary	Jamaica	Morocco	Syrian Arab Republic
Iceland	Jordan	Myanmar	Tajikistan
Ireland	Kazakhstan	Nicaragua	Tanzania, United Republic of
Israel	Lebanon	Nigeria	Togo
Italy	Libya	Occupied Palestinian Territory	Uganda
Japan	Malaysia	Pakistan	Yemen
Korea, Republic of	Maldives, Republic of	Papua New Guinea	Zimbabwe
Kuwait	Marshall Islands	Philippines	
Latvia	Mauritius	Sao Tome and Principe	
Liechtenstein	Mexico	Solomon Islands	

Table A3 (cont'd)

Developed countries (high-income)	Emerging countries (upper-middle income)	Emerging countries (lower-middle income)
Lithuania	Montenegro	Sri Lanka
Luxembourg	Namibia	Sudan
Macau (China)	Nauru	Timor-Leste
Malta	Paraguay	Tunisia
Martinique	Peru	Ukraine
Monaco	Romania	Uzbekistan
Netherlands	Russian Federation	Vanuatu
Netherlands Antilles	Saint Lucia	Viet Nam
New Caledonia	Saint Vincent and the Grenadines	Western Sahara
New Zealand	Samoa	Zambia
Norway	Serbia	
Oman	South Africa	
Palau	Suriname	
Panama	Thailand	
Poland	The former Yugoslav Republic of Macedonia	
Portugal	Tonga	
Puerto Rico	Turkey	
Qatar	Turkmenistan	
Réunion	Tuvalu	
Saint Kitts and Nevis	Venezuela, Bolivarian Republic of	
San Marino		
Saudi Arabia		
Seychelles		
Singapore		
Slovakia		
Slovenia		
Spain		
Sweden		
Switzerland		
Taiwan (China)		
Trinidad and Tobago		
United Arab Emirates		
United Kingdom		
United States		
United States Virgin Islands		
Uruguay		

Appendix IV

Coverage of the Global Wage database

Table A4 Coverage of the Global Wage database, 2017 (percentage)

Regional group	Country coverage	Employee coverage	Approximate coverage of total wage bill
Africa	55.6	84.6	91.3
Americas	68.8	95.9	98.4
Arab States	66.7	69.7	84.8
Asia and the Pacific	66.7	98.9	99.7
Europe and Central Asia	98.0	100.0	100.0
World	72.3	98.5	96.8

Note: Country coverage refers to the number of countries for which we found wage data as a percentage of all the countries in the region; employee coverage refers to the number of employees in countries with data available as a percentage of all employees in the region (as of 2017). The approximate coverage of total wages is estimated based on the assumption that wage levels vary across countries in line with labour productivity (i.e. GDP per person employed, as of 2017), expressed in 2011 US$PPP.

Table A5 Coverage of the Global Wage database, 2007–17 (percentage)

Regional group	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Africa	62.0	62.7	64.4	78.7	88.3	85.3	86.3	83.8	83.5	82.4	62.8
Americas	97.4	97.3	97.2	97.4	97.8	97.7	97.8	97.9	98.0	98.2	97.4
Arab States	45.2	45.1	88.0	87.8	69.2	69.3	69.1	69.4	69.7	68.9	65.6
Asia and the Pacific	99.3	99.2	99.2	99.2	99.2	99.2	99.2	99.3	99.7	96.8	91.5
Europe and Central Asia	98.5	98.5	99.6	99.6	100.0	100.0	99.5	99.4	99.4	99.9	98.8
World	95.0	94.9	97.0	97.6	97.4	97.2	97.1	97.1	97.2	96.4	92.2

Note: See text in Part I for estimation of coverage. A country is counted as covered only when a real observation is available from either a primary of a secondary source. Countries are weighted based on the number of employees times average productivity. For the full methodology, see Appendix I.

Appendix V

National data sources

Country	Region	Latest years	Data type	Data source
Albania	Europe and Central Asia	2013	Labour force survey	Instituti i Statistikave Albania (INSTAT)
Argentina	Americas	2015	Encuesta Permanente de Hogares	NSO – latest data from ILO repository or SIALC
Armenia	Europe and Central Asia	2015	Labour force survey	INSTAT National Statistical Service of the Republic of Armenia
Australia	Asia and the Pacific	2016	Household, Income and Labour Dynamics in Australia	Melbourne Institute of Statistics, The University of Melbourne
Austria	Europe and Central Asia	2014	EU-SILC	Eurostat*
Bangladesh	Asia and the Pacific	2017	Labour force survey	Bangladesh Bureau of Statistics
Belgium	Europe and Central Asia	2014	EU-SES	Eurostat*
Brazil	Americas	2015	Pesquisa Nacional por Amostra de Domícilios	NSO – latest data from ILO repository or SIALC
Bulgaria	Europe and Central Asia	2014	EU-SES	Eurostat*
Cabo Verde	Africa	2015	Survey on the minimum wage conducted in joint collaboration between the ILO and the INECV (Instituto Nacional de Estatística Cabo Verde)	Instituto Nacional de Estatística Cabo Verde and the ILO
Canada	Americas	2015	Labour force survey	NSO – data from ILO repository
Chile	Americas	2013	Encuesta Nacional de Empleo	NSO – latest data from ILO repository or SIALC
China	Asia and the Pacific	2013	Chinese Household Income Project	Chinese National Bureau of Statistics
Costa Rica	Americas	2016	Encuesta Continua de Empleo	NSO – latest data from ILO repository or SIALC
Croatia	Europe and Central Asia	2013	EU-SILC	Eurostat*
Cyprus	Europe and Central Asia	2014	EU-SES	Eurostat*
Czech Republic	Europe and Central Asia	2014	EU-SES	Eurostat*
Denmark	Europe and Central Asia	2014	EU-SILC	Eurostat*
Ecuador	Americas	2015	Encuesta Nacional de Empleo, Desempleo y Sub-empleo	NSO – latest data from ILO repository or SIALC
Egypt	Africa	2012	Egypt Labour Market Panel Survey	Economic Research Forum; Central Agency for Public Mobilization and Statistics, Egypt
El Salvador	Americas	2016	Encuesta de Hogares y Propósitos Múltiples	NSO – latest data from ILO repository or SIALC

Country	Region	Latest years	Data type	Data source
Estonia	Europe and Central Asia	2014	EU-SES	Eurostat*
Finland	Europe and Central Asia	2014	EU-SES	Eurostat*
France	Europe and Central Asia	2014	EU-SES	Eurostat*
The Gambia	Africa	2012	Labour force survey	Gambia Bureau of Statistics
Greece	Europe and Central Asia	2014	EU-SILC	Eurostat*
Hungary	Europe and Central Asia	2014	EU-SES	Eurostat*
Iceland	Europe and Central Asia	2013	EU-SILC	Eurostat*
India	Asia and the Pacific	2011–12	Employment and Unemployment Survey, 12th round	NSO – latest data from ILO repository
Indonesia	Asia and the Pacific	2016	Labour force survey (SAKERNAS)	Central Bureau of Statistics, Government of Indonesia
Ireland	Europe and Central Asia	2013	EU-SILC	Eurostat*
Italy	Europe and Central Asia	2014	EU-SES	Eurostat*
Jordan	Arab States	2014	Labour force survey	NSO – latest data from ILO repository or SIALC
Korea, Republic of	Asia and the Pacific	2016	Korean Labour and Income Panel Study	Korea Labor Institute
Latvia	Europe and Central Asia	2014	EU-SES	Eurostat*
Lithuania	Europe and Central Asia	2014	EU-SES	Eurostat*
Luxembourg	Europe and Central Asia	2014	EU-SES	Eurostat*
Madagascar	Africa	2012	National survey on employment and the informal sector	Institut National de la Statistique, Ministry of Economy of Madagascar
Malawi	Africa	2012	Labour force survey	National Statistical Office of Malawi; Ministry of Labour
Malta	Europe and Central Asia	2014	EU-SES	Eurostat*
Mexico	Americas	2016	Encuesta Nacional de Ocupación y Empleo	Instituto Nacional de Estadística y Geografía de México (INEGI)
Mongolia	Asia and the Pacific	2016	Labour force survey	National Statistics Office of Mongolia
Namibia	Africa	2012	Labour force survey	Namibia Statistics Agency
Nepal	Asia and the Pacific	2008	Labour force survey	Central Bureau of Statistics
Netherlands	Europe and Central Asia	2014	EU-SES	Eurostat*
Norway	Europe and Central Asia	2014	EU-SES	Eurostat*
Pakistan	Asia and the Pacific	2015	Labour force survey	Pakistan Bureau of Statistics
Panama	Americas	2016	Encuesta de Mercado Laboral	NSO – latest data from ILO repository or SIALC
Paraguay	Americas	2016	Encuesta Permanente de Hogares	NSO – latest data from ILO repository or SIALC
Peru	Americas	2016	Encuesta Permanente de Empleo	NSO – latest data from ILO repository or SIALC

Country	Region	Latest years	Data type	Data source
Philippines	Asia and the Pacific	2016	Labour force survey	Philippine Statistics Authority
Poland	Europe and Central Asia	2014	EU-SES	Eurostat*
Portugal	Europe and Central Asia	2014	EU-SES	Eurostat*
Romania	Europe and Central Asia	2014	EU-SES	Eurostat*
Russian Federation	Europe and Central Asia	2015	Survey of Income and Participation in Social Programmes	Russian Statistical Agency (ROSTATS)
Sierra Leone	Africa	2014	Labour force survey	Government of Sierra Leone
Slovakia	Europe and Central Asia	2014	EU-SES	Eurostat*
Slovenia	Europe and Central Asia	2014	EU-SES	Eurostat*
South Africa	Africa	2015	Labour force survey	Statistics South Africa
Spain	Europe and Central Asia	2014	EU-SES	Eurostat*
Sri Lanka	Asia and the Pacific	2013	Labour force survey	Department of Census and Statisics, Sri Lanka
Sweden	Europe and Central Asia	2014	EU-SES	Eurostat*
Switzerland	Europe and Central Asia	2016	Swiss Household Panel Survey	Swiss Federal Statistics Office
Tanzania, United Republic of	Africa	2014	Integrated labour force survey	National Bureau of Statistics
Thailand	Asia and the Pacific	2015	Labour force survey	National Statistical Office of Thailand (NSO) – Government of Thailand
Tunisia	Africa	2014	Tunisia Labour Market Panel Survey	Economic Research Forum; Institute of National Statistics of Tunisia
Turkey	Europe and Central Asia	2015	Turkish labour force survey	Turkish Statistical Institute
Ukraine	Europe and Central Asia	2012	Labour force survey	Ukraine State Statistics Office
United Kingdom	Europe and Central Asia	2014	EU-SES	Eurostat*
United States	Americas	2016	Current Population Survey	Bureau of Labor Statistics
Uruguay	Americas	2016	Encuesta Continua de Hogares	NSO – latest data from ILO repository or SIALC
Viet Nam	Asia and the Pacific	2016	Labour and employment survey	General Statistics Office of Viet Nam; Ministry of Planning and Investment of Viet Nam

Note: EU-SES = European Union Structure of Earnings Survey; EU-SILC = European Union Statistics on Income and Living Conditions; INSTAT = Instituti i Statistikave Albania; NSO = National Statistics Office; SIALC = Sistema de información y análisis Laboral de América Latina y el Caribe.

* Part of this report is based on data from Eurostat. We acknowledge and thank Eurostat for providing data from the Structure of Earnings Survey under contract number RPP 252/2015-SES-ILO, and data from EU-SILC under contract number 52/2013-EU-SILC. The responsibility for all conclusions drawn from these data lies entirely with the authors.

Appendix VI

Decomposing the gender pay gap

Part II of this report applies the method proposed by Fortin, Lemieux and Firpo (2011) to identify, measure and decompose the explained and unexplained parts of the gender pay gap. The decomposition attributes a weight to each of the variables that are assumed to be determinants of the gender pay gap and consists of three steps. The first step serves to estimate a counterfactual wage distribution for women – that is, the wage distribution that would characterize women if they were paid the same returns for their labour market characteristics as men. The second step consists in using the counterfactual wage distribution to separate the explained and unexplained parts of the gender pay gap at each quantile of the pay distribution (in our case, the hourly wage distribution). The third and final step consists in applying unconditional quantile regression to estimate the weight attached to each variable that contributes to determining the gender pay gap.

What follows aims to provide a heuristic understanding of unconditional quantile regression, on a step-by-step basis, with reference to the gender pay gap. It may be of particular use to practitioners who have not previously come across unconditional quantile regression. It should not, however, be seen as a full expression for those seeking a more detailed understanding of the properties and relative usefulness of the procedure. For this purpose we recommend that the reader refer to the 2011 paper by Fortin and colleagues and the references therein.

Step 1: Identifying the counterfactual wage distribution

The counterfactual wage distribution for women is the wage structure that would have been realized among women if they had received the same returns as men in relation to their (women's) labour market endowments and attributes. Fortin, Lemieux and Firpo (2011) propose the use of a "weighting factor" to elicit such a counterfactual distribution. Intuitively, the weighting factor assigns higher weights to women whose endowments and attributes make them more similar to men in the labour market, while women whose characteristics make them less similar to men wage employees are assigned a lower weight.

For each wage worker i in the sample we observe a set of indicators (X) that describes the characteristics of men ($T_i = 1$) and women ($T_i = 0$) in the labour market; for example, X can include age, education, contractual arrangements, etc. The information can be used to estimate the probability of having a particular set of attributes, where a wage employee is a man, that is, $P(X|T=1)$ or a woman, that is, $P(X|T=0)$. It can be shown that $P(X|T=j)=P(T=j|X)/P(T=j)$, for $j=0.1$, where $P(T=j)=P(j)$ simply indicates the probability of being a man ($j=1$) or a woman

(j=0) in the population. Based on this, the individual's specific weighting factor (ω_i) can be constructed as follows:

$$\omega_i = \frac{P(T_i=1|X)}{P(T_i=0|X)} \cdot \frac{P(0)}{P(1)} \quad (1)$$

The terms $P(T_i=1|X)$ and $P(T_i=0|X)$ in expression (1) can be regarded as propensity scores and can be estimated using either a probit or a logit specification. The estimation of either one of these specifications produces coefficients for each of the variables in X. These coefficients can be employed to project the conditional probabilities for each man and each woman wage employee in the sample. Thus, an estimate of $P(T_i=1|X)$ projects the conditional probability of being a man for each wage employee (that is, for both men and women). When the estimated value of $P(T_i=1|X)$ is high for a woman this means that her labour market attributes make her very similar to men wage employees in the population. It also means that the weighting factor constructed using expression (1) will be high.

Once the weighting factor has been constructed, this can be used to "re-weight" the wages observed for women wage employees; these re-weighted values – where the wages of women who are more similar to men are given a higher weight, and those of women less similar to men are given a lower weight – serve to construct an empirical distribution that emulates the wage structure of women if they had received the same returns as men. This is the counterfactual distribution. Thus, if the cumulative density function for women wage employees (f) in the population can be expressed as $F_f(y)=\Sigma_{i\in n(f)} w_i \cdot I\{Y_i \leq y\}$, where Y_i denotes the wage of a woman $i \in n(f)$ in the sample of women $n(f)$, and w_i is the population (frequency) weight, then the counterfactual wage distribution for women can be similarly expressed as $F_C(y)=\Sigma_{i\in n(f)}(\omega_i \cdot w_i) \cdot I\{Y_i \leq y\}$. This shows how the re-weighting factor enters the estimation of the counterfactual for women wage employees. Likewise, we can estimate the cumulative distribution function on wages for men, namely, $F_m(y)=\Sigma_{i\in n(m)} w_i \cdot I\{Y_i \leq y\}$.

In practice, once the re-weighting factor has been estimated, standard software packages can be employed to draw distributional statistics – for example quantiles – directly by simply applying the appropriate weights to the wages of men (w_i, $i \in n(m)$), women (w_i, $i \in n(f)$) and the counterfactual (($\omega_i \cdot w_i$), $i \in n(f)$), respectively. What is more important is to make sure that the corresponding propensity scores are well-approximated by including as much information as possible (indicators in X and several interaction terms between them). This should guarantee that the counterfactual to women are well captured by the re-weighting factor.

In summary, once the re-weighting factor is constructed it is possible to draw quantiles from each of the three empirical wage distributions, namely, from that of men (q_v^m), from that of women (q_v^f) and from that of the counterfactual wage distribution of women (q_v^c). The suffix "v" indicates each one of the nine quantiles (decile threshold values) of a wage distribution, that is, $v=\{1,2,3,\ldots,8,9\}$. For example, for v=5 the quantile values q_5^m, q_5^f and q_5^c indicate the median at the men's, women's and counterfactual to women's wage distributions, respectively.

Step 2: Using the counterfactual wage distribution to identify the explained and unexplained parts of the gender pay gap

Let y_i^g be the natural logarithm of wages observed for group g in the population (hourly wages, say), where $g=m,f,c$ following the notation outlined in the previous step. Drawing quantiles from each of the three distributions of the natural logarithmic transformation, the gender pay gap at the *vth* quantile (Δ^v) can be expressed as follows:

$$\Delta^v = q_v^m - q_v^f \tag{2}$$

Basically, expression (2) shows the distance between two quantiles that have been drawn from two wage distributions of the (natural logarithms of) wages: that of men (q_v^m) and that of women (q_v^f). We can also draw the *vth* quantile from the counterfactual distribution, that is, q_v^c: this would represent the hourly wage at that quantile that women would have earned if they had been paid the same as men for similar endowments and attributes. Using this counterfactual quantile, the following can be constructed:

$$\Delta^v = \underbrace{q_v^m - q_v^c}_{\substack{EXPLAINED\ PART \\ =COMPOSITION\ EFFECT}} + \underbrace{q_v^c - q_v^f}_{\substack{UNEXPLAINED\ PART \\ =STRUCTURAL\ EFFECT}} = \Delta_X^v + \Delta_U^v \tag{3}$$

Since the counterfactual emulates what women should get for sharing the same endowments and attributes as men, the distance between what men get and what women should receive if they have the same endowments and attributes as men is explained by differences in endowments and labour market characteristics. This is why Δ_X^v is called the "explained" part of the gender pay gap, also known as the gender pay gap due to "composition effects". On the other hand, the distance between what women should get (for their endowments and attributes and as emulated by the counterfactual) and what they actually get (for these endowments and attributes) cannot be explained: this is the part Δ_U^v that remains "unexplained", that is, the part that is due to a difference between men's and women's wage structures once we control for differences in labour market characteristics. Since the unexplained part is due to a difference in wage structures, Δ_U^v is also referred to as the "structural effect".

In practical terms, the decomposition of the gender pay gap as expressed in (3) requires, first, the transformation of wages in the sample into logarithmic scales; second, the construction of the re-weighting factor as described in (1); third, the appropriate application of weights – allowing for the re-weighting factor on women's wages to draw the (logarithmic) wage distribution for men, women and the counterfactual; fourth, drawing the quantiles of interest; and fifth and last, applying the simple distance as expressed in (3) to estimate the gender pay gap, and its decomposition, at each selected quantile of the wage distribution.

Step 3: Using unconditional quantile regression to decompose the gender pay gap

Estimating the gender pay gap is an important step because it provides a measure of pay differentials between women and men. But the estimate can be further analysed to identify how each individual's endowments, their job characteristics and workplace attributes – in sum, labour market characteristics – contribute to the formation of the gender pay gap. We start with the assumption that all these labour market attributes, embodied in the set of indicators X, underlie the wage determination process in the labour market. That is, indicators such as age and education, but also working time, contractual conditions, occupational categories, geographical region of the workplace and industrial sector, all contribute to explaining the wage that individuals get in a given country. In essence, the proposed decomposition method (unconditional quantile regression) estimates coefficients for each of the covariates in the set X. Each of these coefficients acts as a weighting factor to estimate the share of the gender pay gap attributable to each covariate in X. Whatever remains of the gender pay gap that cannot be attributed to the covariates is what we call the unexplained part of the gender pay gap.

The method of "unconditional quantile regression" estimates the coefficients for each covariate in X across the wage distribution – that is, at each quantile – while preserving the property of measuring the unconditional effects of the covariates (for example, a change in education) across the population (Koenker and Bassett, 1978).[1] The method of unconditional quantile regression estimates the partial effects that covariates in X have on a transformation of the quantile and not on the quantile itself; the transformation inflicts a small change on the quantile, reflecting the influence that each individual (wage) has on the location of the quantile. Adding this small change (or "influence") to the quantile leads to a random variable – individual dependent – that can be understood as a linear approximation of the quantile. The transformation of the quantile is called the "Recentered Influence Function", or RIF for short. It can be shown that the transformed quantile has the following structure:

$$RIF_i = q_v^g + IF_i,\ i \in n(g) \quad where \quad IF_i = \frac{v - I\{Y_i \leq q_v^g\}}{f_Y(q_v^g)} \tag{4}$$

In expression (4), $I\{Y_i \leq q_v^g\}$ is an identity function that equals 1 for wage values smaller or at the quantile, and 0 otherwise. The term $f_Y(q_v^g)$ is the value of the probability density function at that quantile. Once the RIF variable is constructed,

1. The report shows that the gender pay gap varies significantly across quantiles, so mean regression would not be an appropriate tool to identify the weight that each covariate has in the gender pay gap. An alternative would be to use classic conditional quantile regression (Koenker and Bassett, 1978); but this method estimates coefficients that measure conditional effects (conditional on a subgroup of covariates) and therefore the coefficients do not measure unconditional partial effects. Instead, conditional quantile regression produces coefficients that are conditional and vary in relation to specific subsets of the covariates in the conditional set: this can be seen if one takes partial effects of the functional form of a conditional quantile specification. In contrast, unconditional quantile regression returns coefficients that are in fact partial effects, that is, coefficients that measure the impact of a covariate on the wage structure in the population and not with respect to (conditional on) a subgroup given by other covariates in the conditional set. For a more detailed account, see Fortin, Lemieux and Firpo, 2011.

this is a quantile-specific random variable that reflects changes to the quantile (any quantile) as a result of changes in the underlying distribution which, ultimately, depends on the covariates in X. Thus, applying regression analysis to explain the covariate in (4) – that is, RIF regression – provides a tool to estimate the partial effects of each covariate in X on the (transformation of the) quantile. Fortin, Lemieux and Firpo (2011) show that the estimate of the partial effects each of the k variables in X, namely, $\hat{\beta}_k$, can be obtained using ordinary least squares of RIF_i on X, that is, $RIF^{v}_{i\in g} = \Sigma_k x_{k,g} \beta^{g}_{k} + e_{i\in g}$ for $g = m, f, c$. Once these partial effects are estimated they can be used to project the quantiles for men, women and the counterfactual as expressed in (3), so that the following applies:

$$\begin{aligned} \Delta^{v} &= \Delta^{v}_{X} + \Delta^{v}_{U} \\ &= \bar{X}_m \hat{\beta}^{m,v} - \bar{X}_f \hat{\beta}^{c,v} + \bar{X}_f \hat{\beta}^{c,v} - \bar{X}_f \hat{\beta}^{f,v} \\ &= \underbrace{\left(\bar{X}_m \hat{\beta}^{m,v} - \bar{X}_f \hat{\beta}^{c,v}\right)}_{\Delta^{v}_{X}} + \underbrace{\bar{X}_f \left(\hat{\beta}^{c,v} - \hat{\beta}^{f,v}\right)}_{\Delta^{v}_{U}} \end{aligned} \tag{5}$$

In expression (5), the term $\bar{X}_g$, where $g = m, f, c$, explains the average value of the covariates for each of the populations (women and men, where $g = c$ implies the average value of the covariates for women). Expression (5) shows the decomposition of the gender pay gap in relation to the covariates, at each quantile of the wage distribution. The composition effect (Δ^{v}_{X}) shows clearly as the difference in covariates – considering that the coefficients $\hat{\beta}^{m,v}$ and $\hat{\beta}^{c,v}$ will be very close in value (by construction). Therefore, this is the contribution to the gender pay gap due to differences in covariates between individuals. On the other hand, the structural effect (Δ^{v}_{U}) is the contribution to the gender pay gap due to differences in returns (that is, the difference between $\hat{\beta}^{f,v}$ and $\hat{\beta}^{c,v}$) at that quantile and for a given quantity (average value) of the covariates among women in the population. This difference in returns describes a difference in the structure of wages between women and men that cannot be explained by their covariates and, therefore, it is the unexplained part of the gender pay gap.

Appendix VII

Educational attainments of men and women wage employees by their location and ranking in the hourly wage distribution

The "score in education" is a country-specific value that gives each individual a score to indicate their relative achievement in education in a given country. For all 64 countries for which we have data, individuals declare their educational attainment as a categorical outcome. Typically there will be about five categories: "no formal education", "less than or equal to primary education", "secondary education without high school diploma", "high school completed, including those with some vocational education or training" and "university studies". The "score in education" simply assigns to each individual a value that is related to these categories and increases exponentially for higher educational achievements. Thus, individuals in the first and lowest category (no formal education) are assigned a value of 1; in the second category they are assigned a value of 4; and in the next three categories they are assigned values of 9, 16 and 25, respectively. This exponential increase simply aims at emulating the relative values that would have been given if we had data on the number of years spent in education to achieve a particular level of education. The exponential assignment helps to avoid assuming that the jump between one educational category and the next implies a constant and even effort (which is what the category number alone does). The assigned value is the score that an individual gets to quantify his or her education relative to other wage employees in a given country.

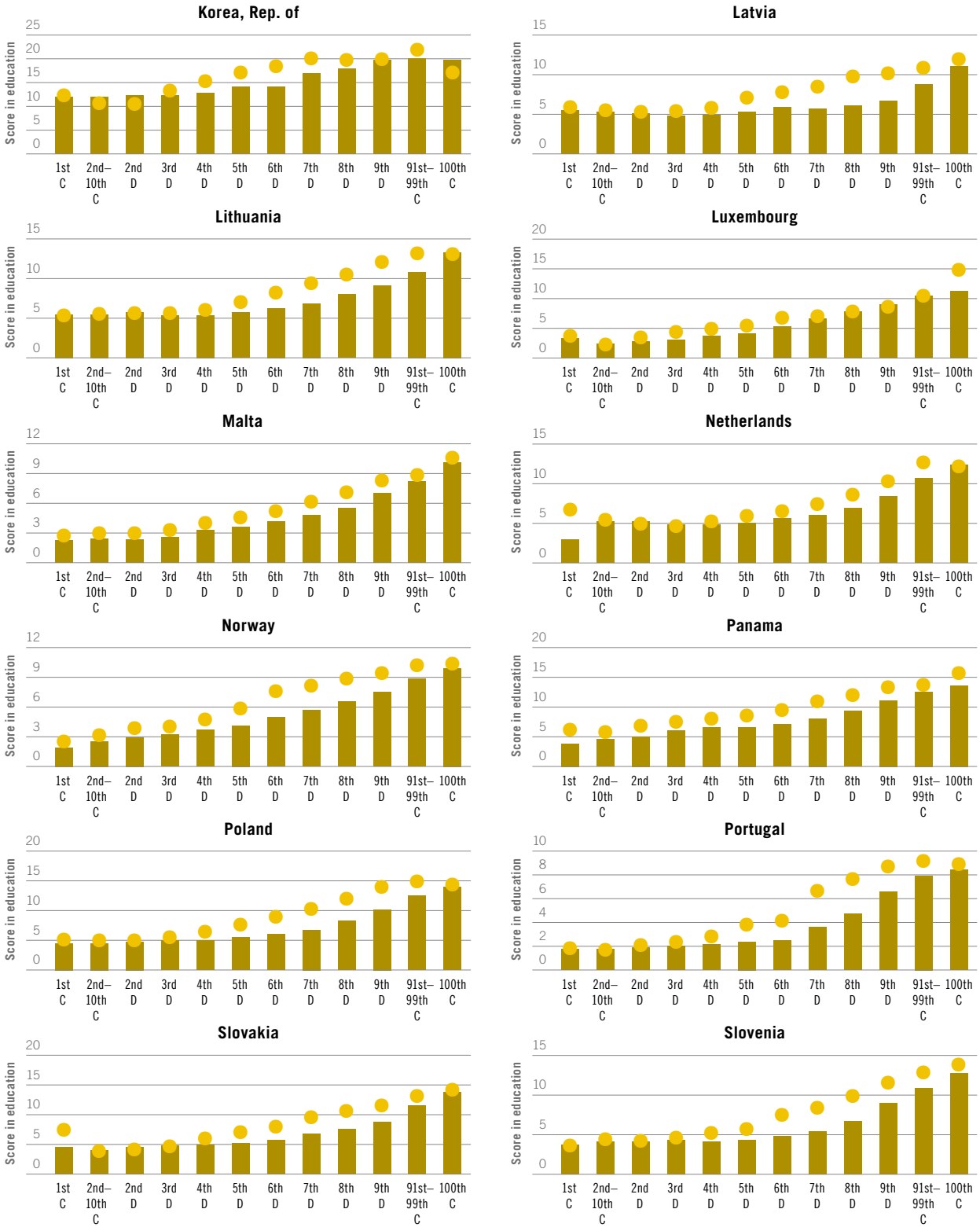
Once the score value is assigned to each individual, we rank all wage employees according to their hourly wages. Then, within each decile of this ranking, we take the weighted average of the "score in education" using the frequency weights in the sample. Each of the charts below shows the plot of the score against the deciles of the hourly wage distribution. To enhance the illustrative power of the examples, the charts are drawn isolating individuals at the top and bottom centiles of the hourly wage distribution to enable a better understanding of the educational attainments of the extreme earners in the population. The charts below show all 64 countries included in our data sets, as described in Appendix V.

Figure A3 Educational attainments of men and women wage employees by their location and ranking in the hourly wage distribution (score in education)

High-income countries

Figure A3 (cont'd)

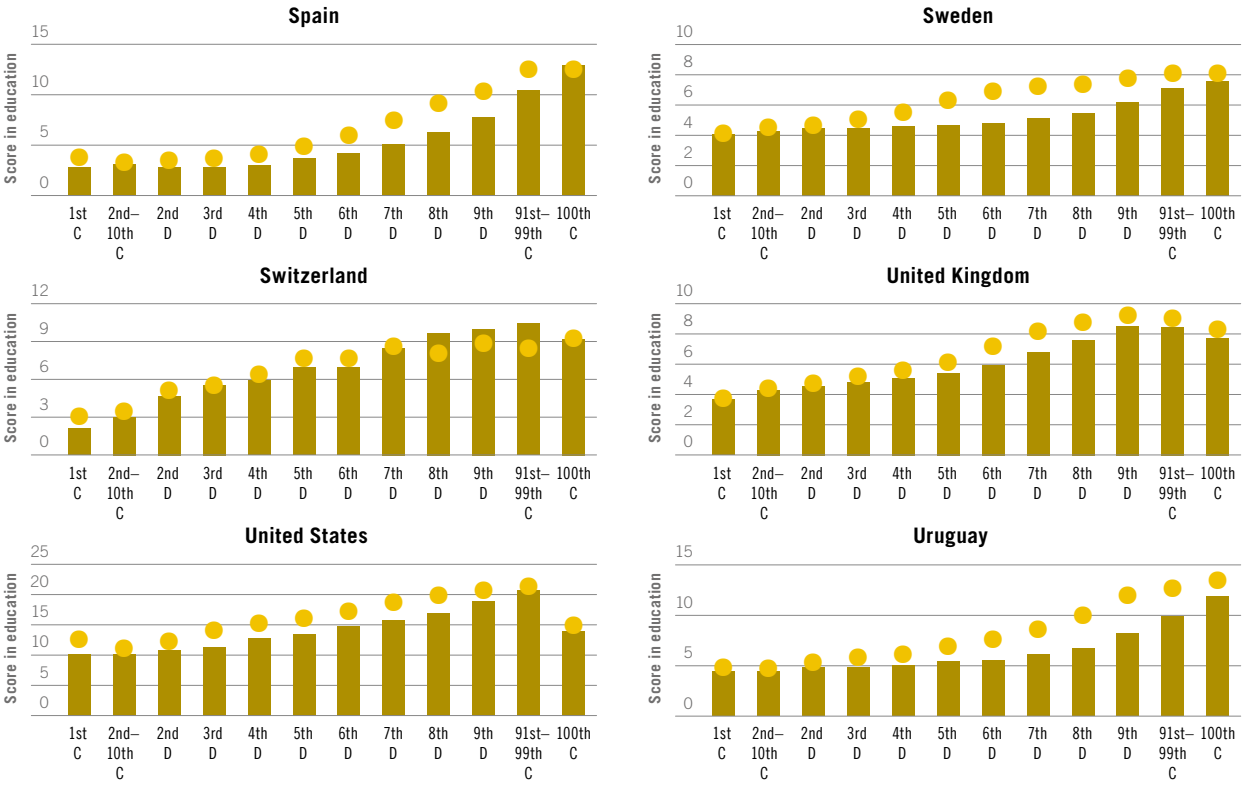
High-income countries (cont'd)



Men Women C = centile / D = decile

Figure A3 (cont'd)

High-income countries (cont'd)



Upper-middle income countries

Men Women C = centile / D = decile

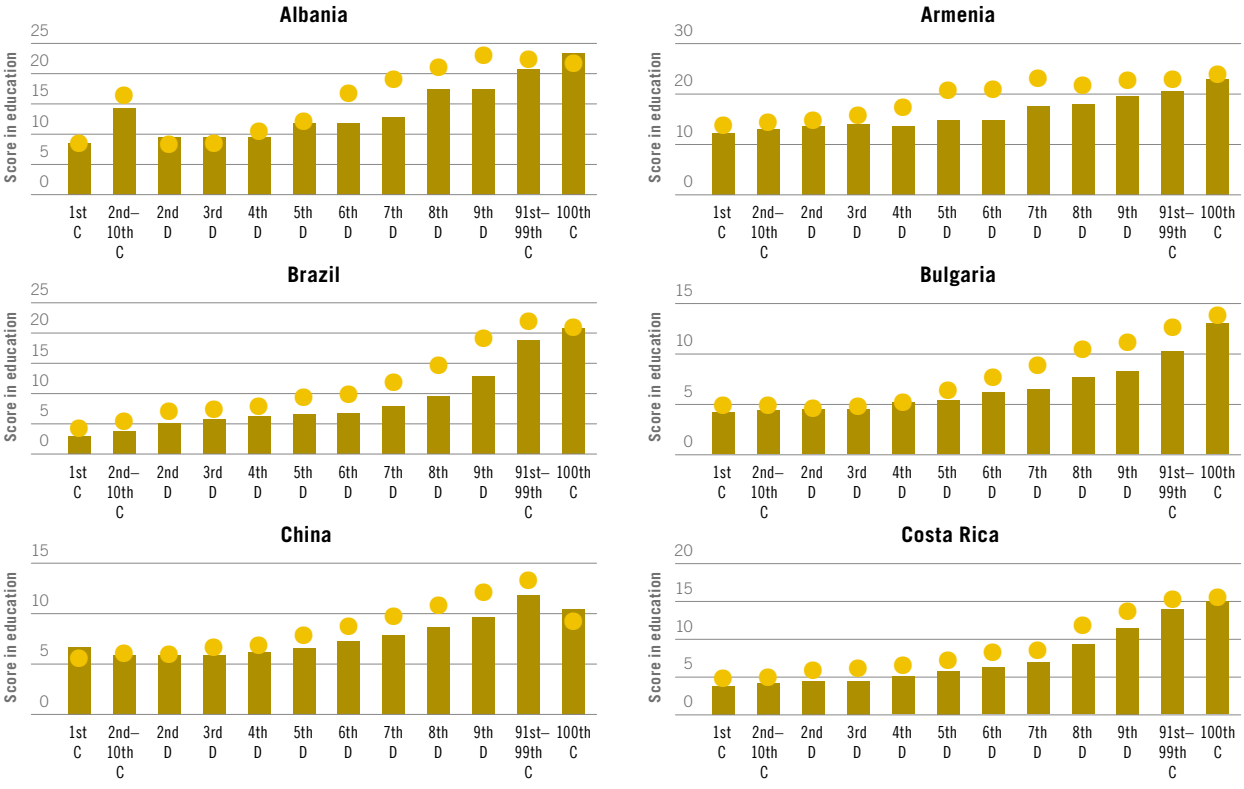


Figure A3 (cont'd)

Upper-middle income countries (cont'd)

Men Women C = centile / D = decile

Figure A3 (cont'd)

Lower-middle and low-income countries

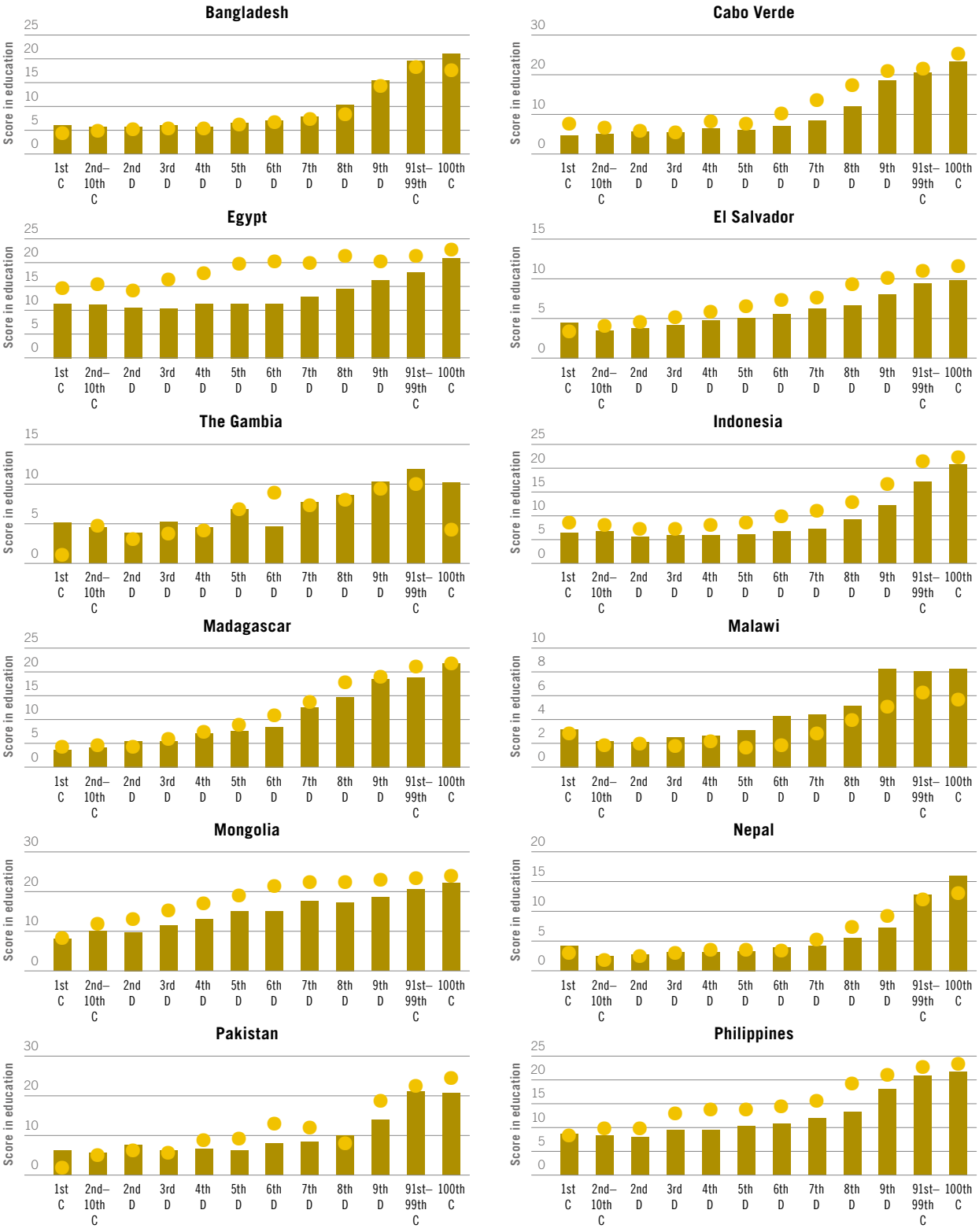
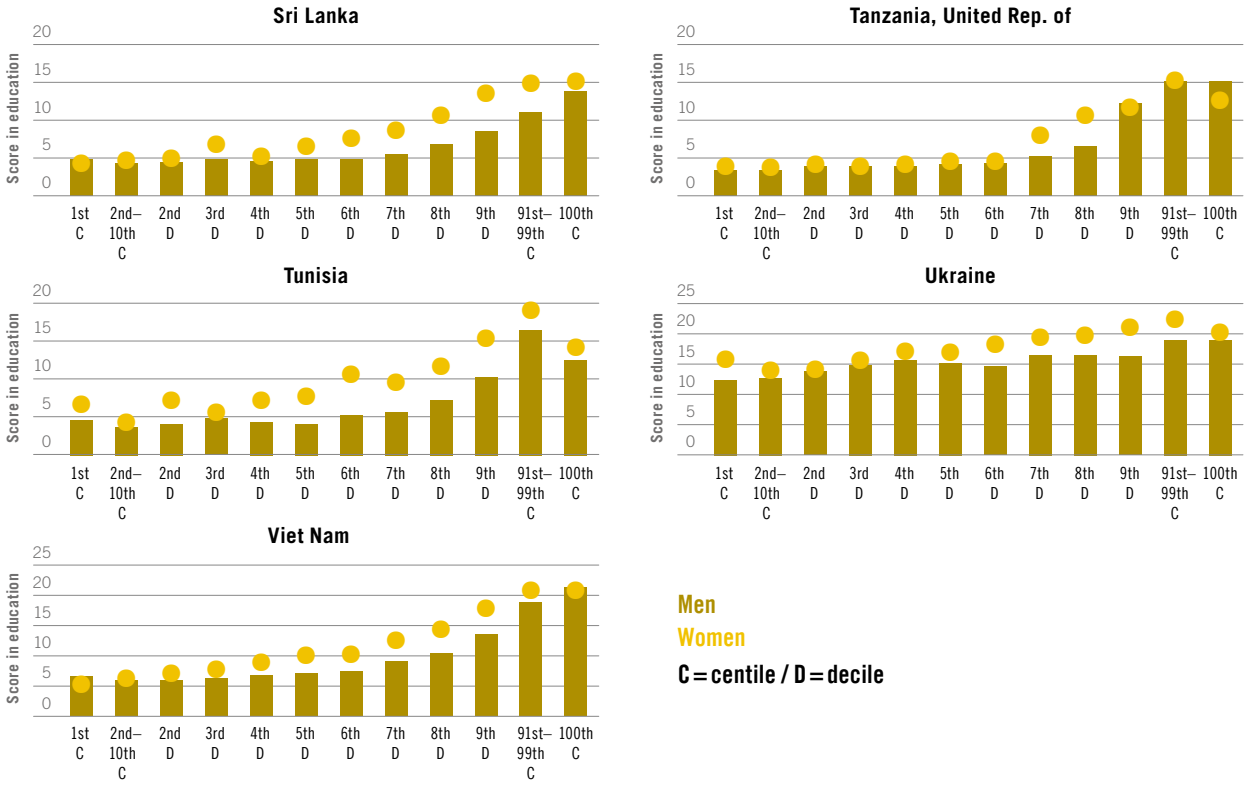


Figure A3 (cont'd)

Lower-middle and low-income countries (cont'd)



Source: ILO estimates using databases described in Appendix V.

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Databases used

- European Commission, AMECO (Annual macro-economic database)
- ILO Global Wage database
- ILOSTAT
- IMF World Economic Outlook database
- OECD Earnings database
- World Bank Open database

For databases used in Part II, please refer to Appendix V, "National data sources".

Global Wage Report 2018/19
What lies behind gender pay gaps

This report examines the evolution of real wages around the world, giving a unique picture of wage trends globally and by region.

The 2018/19 edition analyses the gender pay gap. The report focuses on two main challenges: how to find the most useful means for measurement, and how to break down the gender pay gap in ways that best inform policy-makers and social partners of the factors that underlie it. The report also includes a review of key policy issues regarding wages and the reduction of gender pay gaps in different national circumstances.

“The Global Wage Report is central to the analysis of wage trends and labour market developments as well as to the theoretical debate about the role of labour in the economy. It is an indispensable publication for economists, trade unionists, employers and the interested public.” – Hansjörg Herr, Berlin School of Economics and Law.

ISBN 978-92-2-031346-6