



# Where are the jobs?

## Employment patterns across sectors and occupations<sup>1</sup>

Labour markets are evolving and adapting to technological advances, innovations in business and production processes and the emergence of new economic activities, the demand for new services and the data revolution. Global employment has been increasing for many decades now, and is expected to continue doing so at least in the near future. But where is this employment being created? Which sectors and occupations are growing? Where are jobs being lost?

This brief casts light on the trends in employment by sector and occupation, by focusing first on the broad sectors and occupations at the global level before moving on to analysing regional patterns. More detailed categories of economic activity and occupation are then investigated to provide more in-depth information. Finally, the link between trends in sectors and occupations and the educational level of the workforce is assessed.

### Employment by broad sector and occupation

Global trend of rising share of employment in services and high-skilled employment projected to continue

Data on employment by sector describe the main activity of the establishment where a person works or the activity contributing most to the value added of the entity (irrespective of the person's specific duties or functions), while occupational data refer to the skills required in the job or position held. The employment distribution among the three broad sectors of economic activity (agriculture, industry and services) and among the main occupations provides valuable information on the degree and nature of economic development. Typically, as economies develop, the workforce shifts from a great concentration of employment in agriculture (mainly labour-intensive and with a low skill level), to increased employment in industry and then in services, while the distribution of workers across the skills spectrum shifts from a concentration of low-skilled workers to increasing shares of workers with medium and high skill levels.

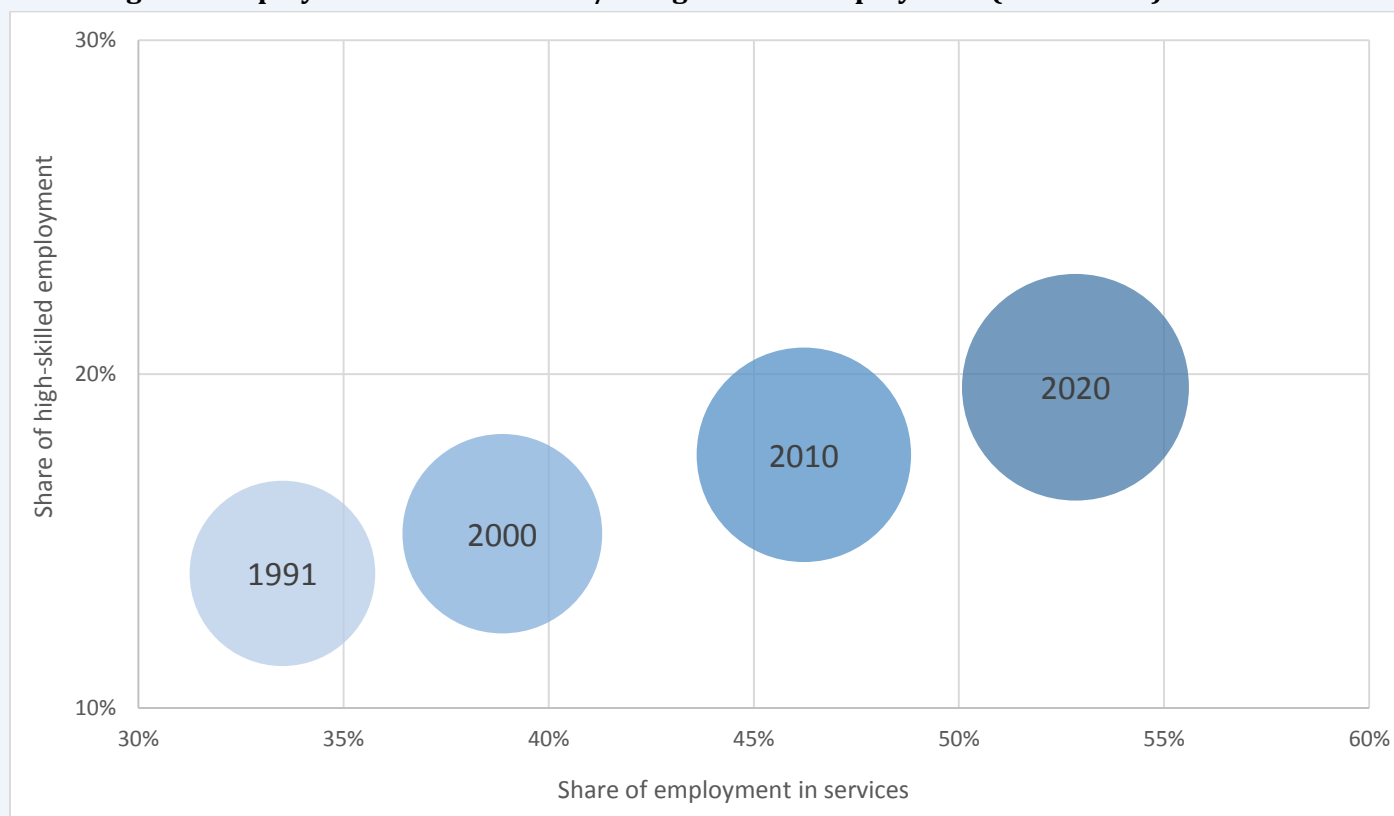
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<sup>1</sup> This brief was prepared by Rosina Gammarano, Economist in the Data Production and Analysis Unit, ILO Department of Statistics.

In a majority of countries (over 58 per cent of the 189 countries and territories for which ILO estimates from November 2017 are available), services represented over half of national employment in 2017, and in around 72 per cent of these 189 countries, services was the largest sector in terms of employment. In around 20 per cent of countries, the majority of employment is in agriculture, and in over 24 per cent of countries, agriculture was the largest sector. In terms of the occupational distribution, in around 81 per cent of countries, more than half of all workers held positions requiring a medium skill level, and in around 93 per cent of countries medium-skilled jobs represented the highest share of employment.

These patterns are clear in the global data as well: in 2017, services represented 51 per cent of global employment, and almost 66 per cent of global employment had a medium skill level. When it comes to the trends, both the share of employment in services and the share of high-skilled employment have continuously increased at the global level since the 1990's, while global employment has steadily expanded. These upward trends are expected to continue in the near future (see figure below).<sup>2</sup>

### Share of global employment in services and/or high-skilled employment (1991-2020)

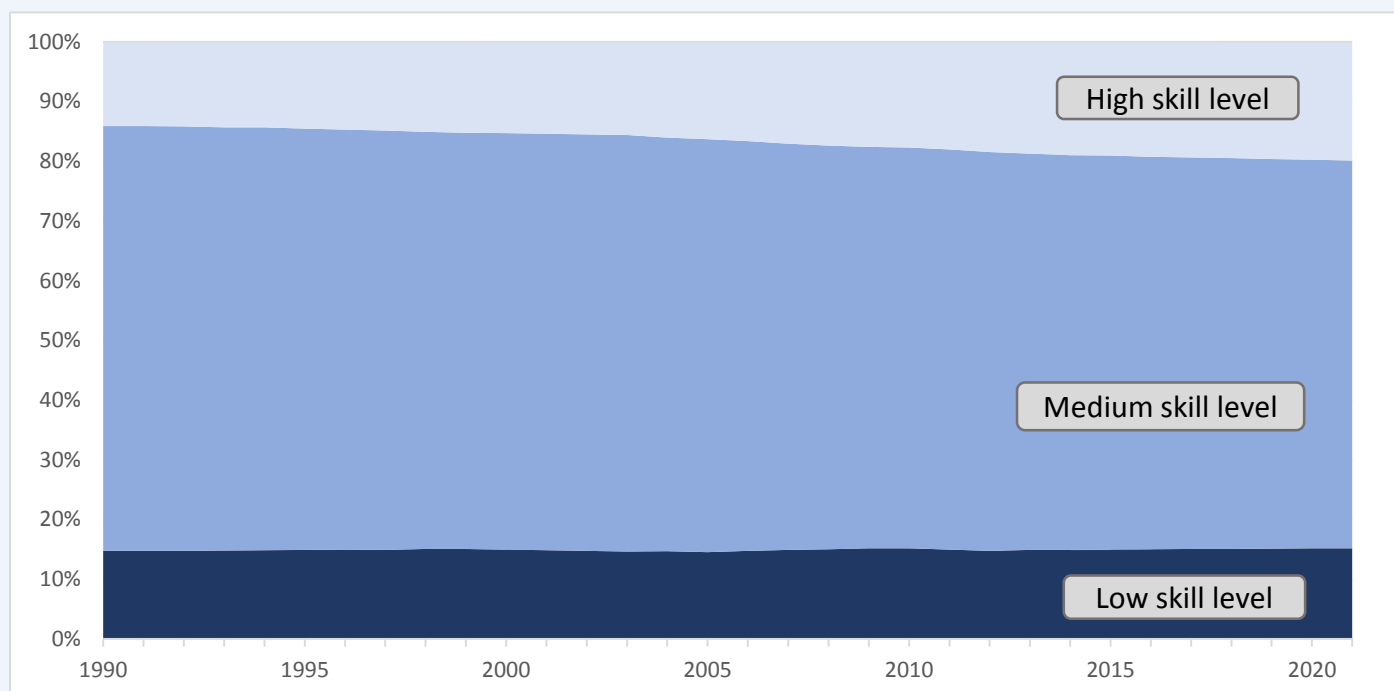
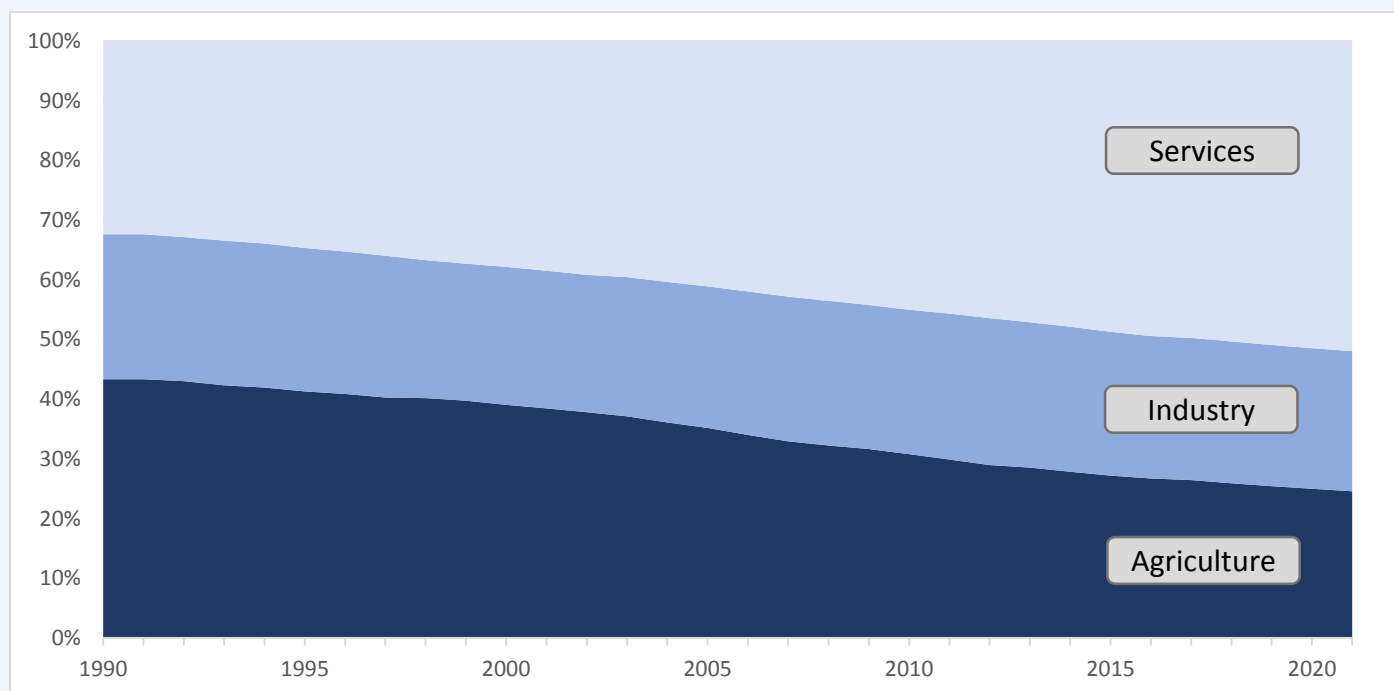


Source: ILOSTAT, ILO Estimates and Projections, November 2017. Note: The bubbles are sized proportionately according to the size of employment. In all figures included in this brief, services refer to sections G to U of the ISIC Rev.4 and G to Q of the ISIC Rev.3, and high skill level refers to categories 1 to 3 of the ISCO-08 or ISCO-88.

As shown in the following figures, these gains in the share of employment in services and the share of high-skilled employment are mainly explained by a decline in the relative importance of agricultural employment and medium-skilled employment, respectively. The (albeit moderate) increase in the share of low-skilled employment suggests that elementary occupations remain widespread in all economic sectors, and that it is easier for the workforce to improve their aggregate skill level once an intermediate level has been achieved (that is, it is easier to go from a medium-skilled to a high-skilled job than from a low-skilled to a medium-skilled job).

<sup>2</sup> Working-age population refers to ages 15 and over in all figures included in this brief.

## Global employment distribution by broad sector and skill level (1991-2021)

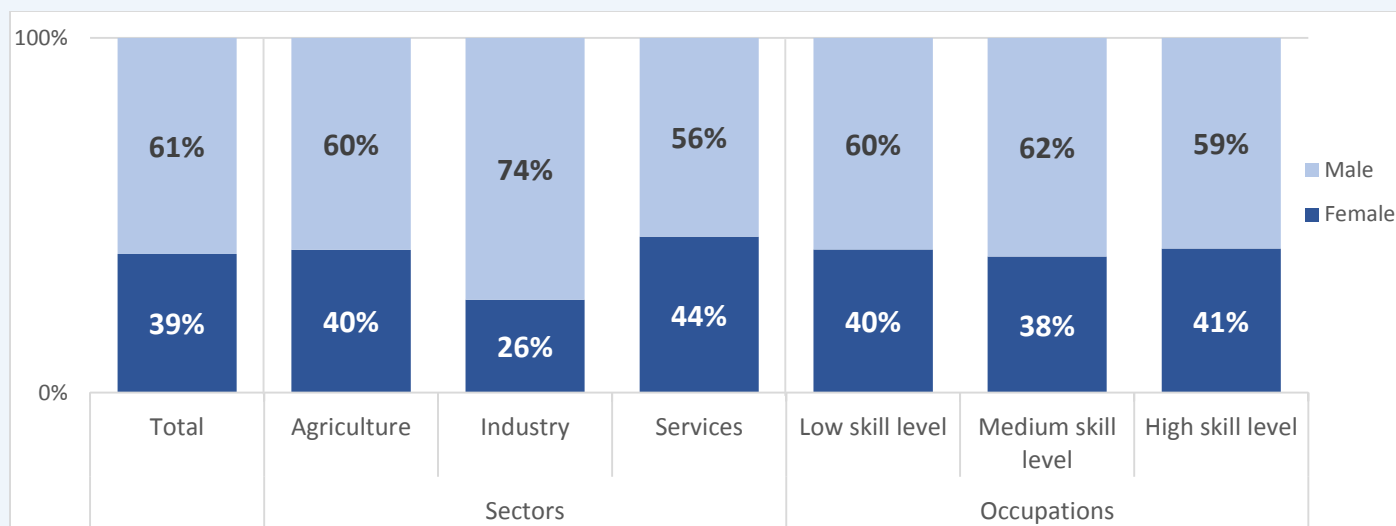


Source: ILOSTAT, ILO Estimates and Projections, November 2017.

It is also enlightening to analyse the trends in global employment (and its distribution by sector and occupation) by sex, so as to assess whether the situation is improving in terms of gender segregation of employment by sector and occupation. The differences in sectoral employment distribution between men and women are long-standing: while both male and female workers are concentrated in services activities, this is most notable for women (over 57 per cent of female employment was in the services sector in 2017, versus 47 per cent of male employment).

Men represented 61 per cent of total global employment in 2017. Although male employment is also predominant in the three broad sectors and in the three main types of occupations, men are strikingly over-represented in industry (as women are in services), with no evident concentration in a given occupation (see figure in the next page).

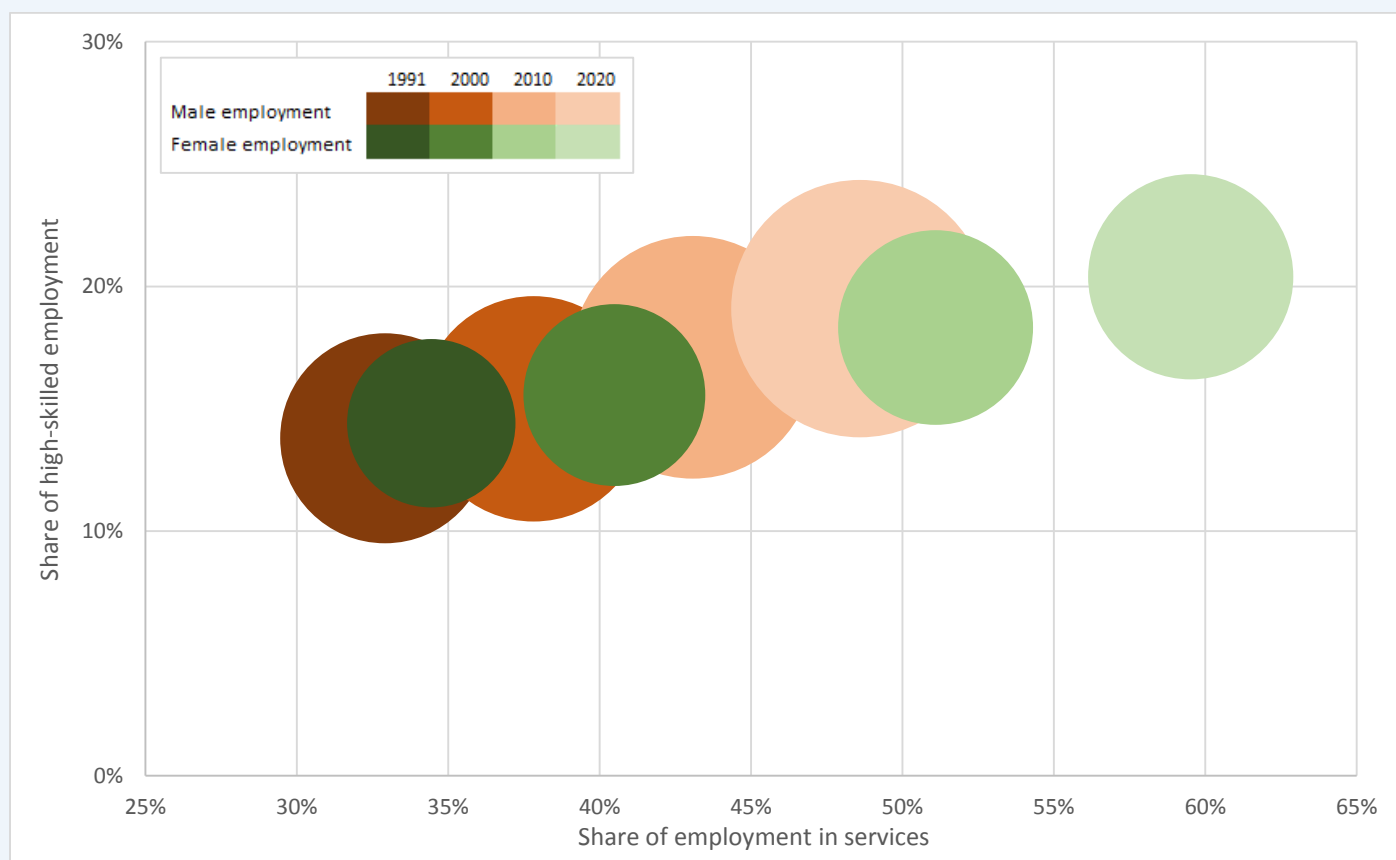
## Distribution by sex of global employment by sector and occupation, 2017



Source: ILOSTAT, ILO Estimates and Projections, November 2017.

In the last decade, male employment grew faster than employment among women, and this pattern is expected to continue, although the share of employment in services is expected to expand more rapidly for women, further increasing their over-representation in this sector. It is noteworthy that women are improving their level of skills more swiftly than men, with the share of high-skilled employment being consistently and increasingly higher among women than among men.

## Share of global employment in services and/or high-skilled employment (1991-2020)



Source: ILOSTAT, ILO Estimates and Projections, November 2017. Note: The bubbles are sized proportionately according to the size of employment.

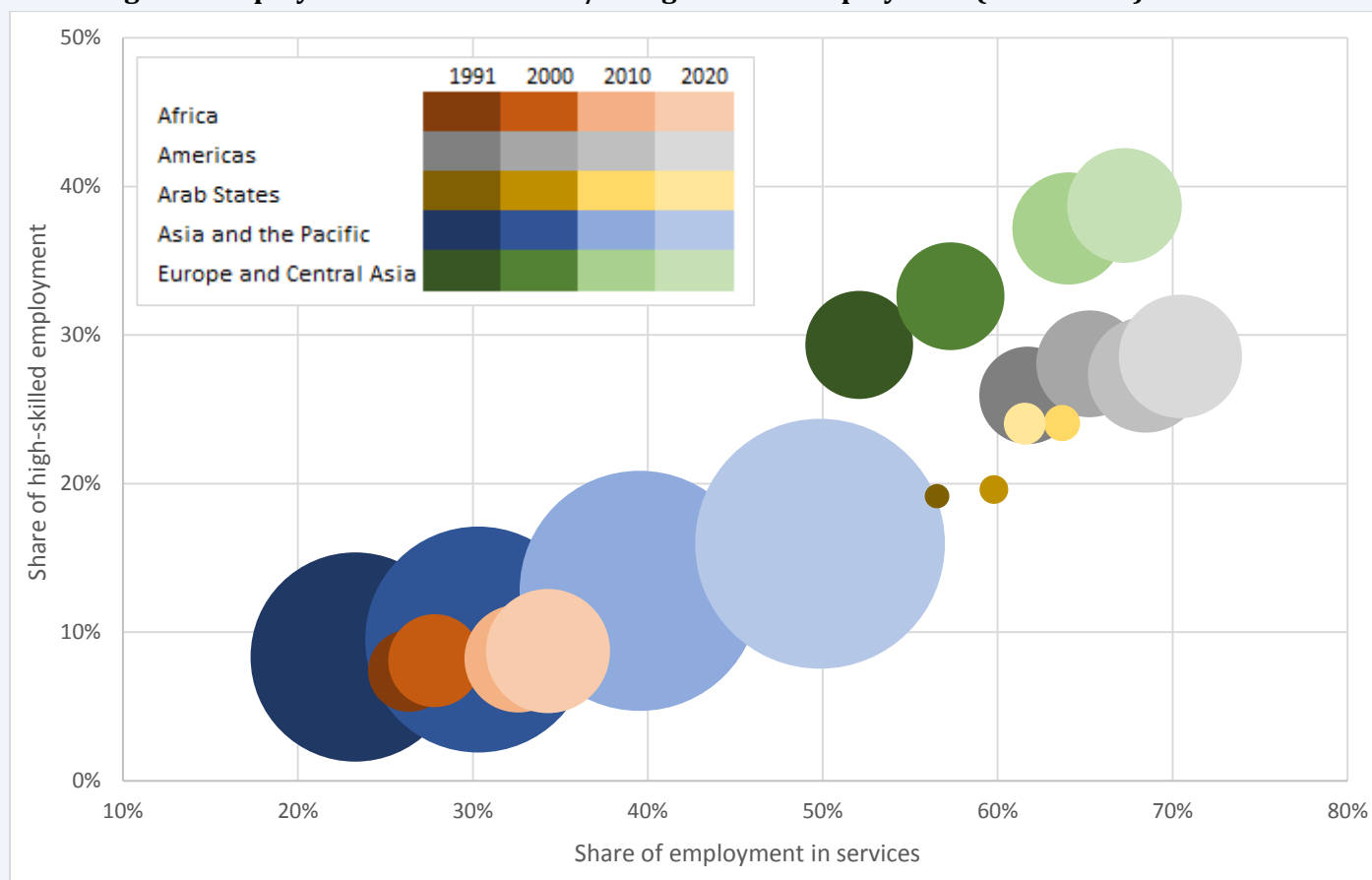
## Regional patterns of employment by sector and occupation

Disparities in stages of development across regions evident in the shares of employment in services and high-skilled employment

The patterns and trends observed at the global level mask significant differences across regions. In fact, although the levels of global employment are clearly driven by employment trends in Asia and the Pacific (accounting for 58 per cent of global employment in 2017), it is mainly Europe and Central Asia and the Americas (and to a certain extent, the Arab States) which lead in terms of the largest shares of employment in services and high-skilled employment, typically associated with more advanced stages of development (see figure below). Africa and Asia and the Pacific are lagging behind in this regard, with 53 per cent and 29 per cent of employment in agriculture in 2017, respectively, compared to a world average of 26 per cent, and only 9 per cent and 15 per cent of high-skilled employment, respectively, compared to a global average of 19 per cent.

As the upward trend in the share of services employment and of high-skilled employment are projected to continue in all regions, the regional disparities are not expected to change significantly in the near future.

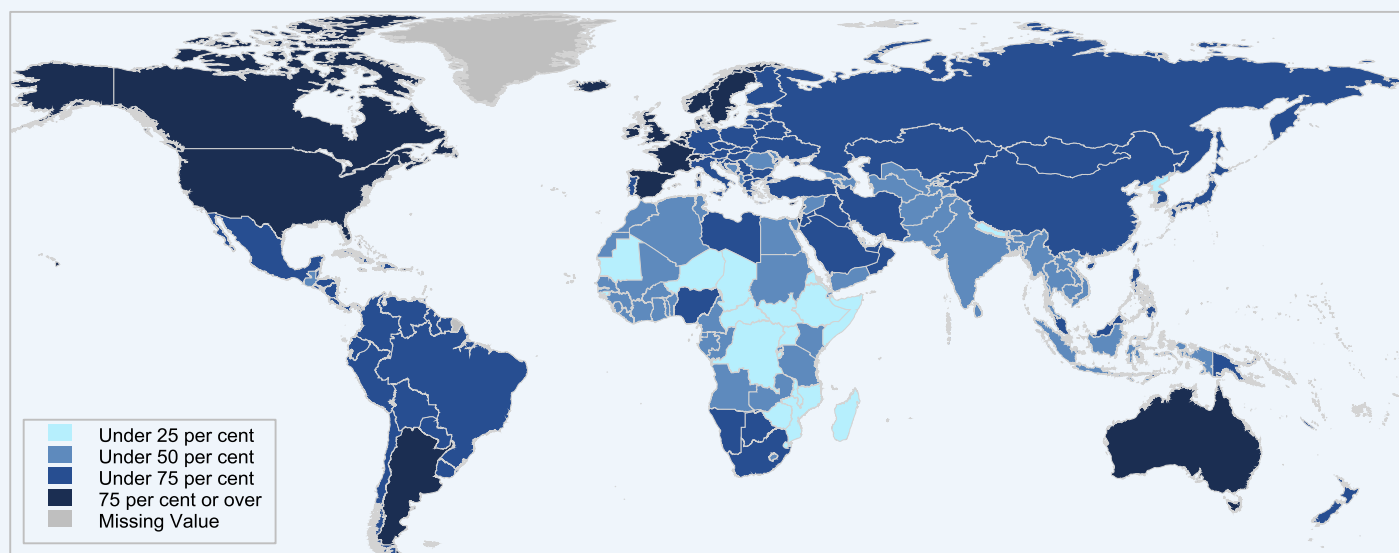
### Share of global employment in services and/or high-skilled employment (1991-2020)



Source: ILOSTAT, ILO Estimates and Projections, November 2017. Note: The bubbles are sized proportionately according to the size of employment.

Naturally, there are also some differences across countries within the same region. Even though the share of employment in services is considerable in Europe and Central Asia and the Americas, it is far higher in Western Europe and North America. Within Asia and the Pacific, Australia has a much larger share of services employment than the rest of the region. The South of the African continent (and to a certain extent, the North) also have a larger proportion of services employment than the rest of Africa (see figure in the following page).

## Share of employment in services, 2017

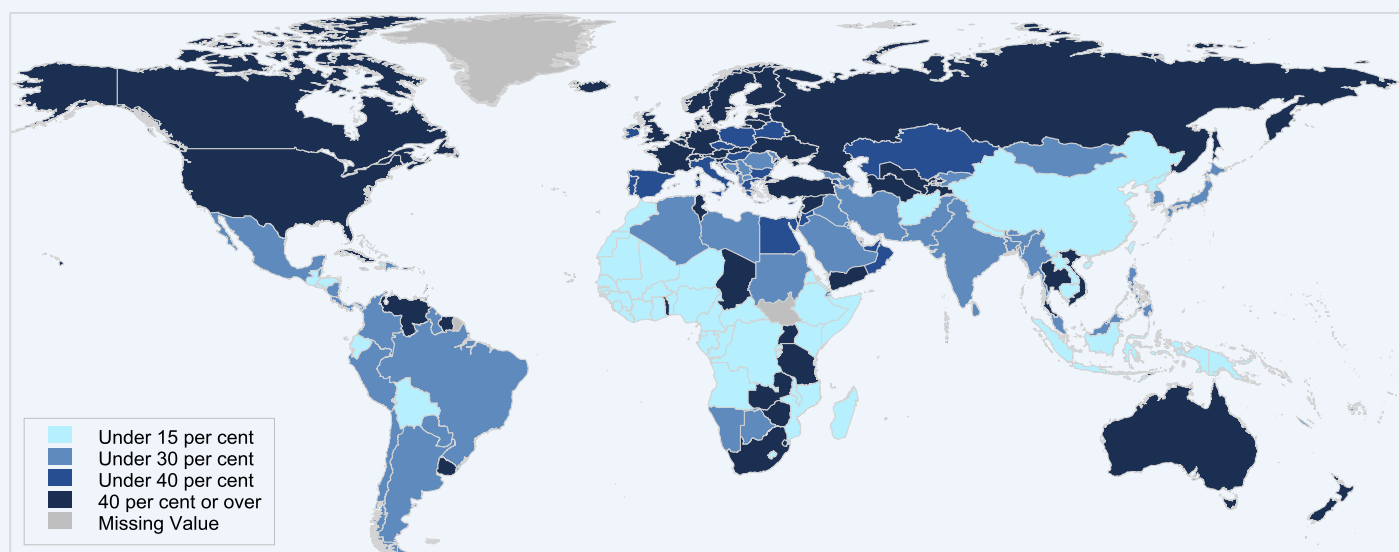


Source: ILOSTAT, ILO Estimates and Projections, November 2017.

Note: The boundaries shown on this map do not imply endorsement or acceptance by ILO.

The intra-regional patterns of the share of employment in services are mirrored in the share of high-skilled employment. Indeed, North America, Western Europe and Australia also have the largest proportions of high-skilled employment in their respective regions (see figure below).

## Share of high-skilled employment, 2017



Source: ILOSTAT, ILO Estimates and Projections, November 2017.

Note: The boundaries shown on this map do not imply endorsement or acceptance by ILO.

## Detailed sectors and occupations

Jobs creation in administrative and support services, tourism, information and communication go hand in hand with an increase in positions for professionals, technicians and sales workers

As interesting as the study of trends in the employment distribution by broad sectors and main skill levels may be, it fails to convey information on shifts within these vast categories.

In fact, to have a better understanding of the economic activities in which employment is being generated and labour demand is focused, it is useful to refer to employment statistics by more detailed economic activities. The study of detailed sectoral data (based on 1-digit level categories of the latest version of the International Standard Industrial Classification of All Economic Activities (ISIC Rev.4)) confirms the patterns observed in the three broad sectors (significant decrease in agriculture, more

modest decrease in industrial activities and rapidly growing services sector), but it also reveals notable changes within sectors. In the last decade, tourism seems to have boomed, with the share of employment in tourism-related activities increasing in the vast majority of countries with available data, including transportation (section H), accommodation and food services (section I), and tour operators (comprised in section N). Not surprisingly, with continuous technological advances and the increasingly ubiquitous Internet, information and communication technologies (section J and some related activities comprised in section N) keep gaining ground in terms of jobs creation, but to a lesser extent (or at least in fewer countries) than professional, scientific and technical activities (section M), which include legal, accounting, architectural, engineering, advertising and veterinary activities, among others. The real estate sector (section L, and rental and leasing activities under section N) is also contributing to job growth, given that its relative share of employment increased between 2005 and 2015 in 62 per cent of countries with available data. However, the most widespread upsurge is that of administrative and support service activities (section N), which cover various activities such as employment services, security services, landscaping and business support. The share of employment in section N has expanded in the last decade in 80 per cent of countries with available data (see table below).

#### Percentage of countries where the share of employment increased from 2005 to 2015, ISIC sections

| Economic activities (sections of the International Standard Industrial Classification of All Economic Activities, Rev.4)      | Total |   | Male  |   | Female |   |
|-------------------------------------------------------------------------------------------------------------------------------|-------|---|-------|---|--------|---|
| A. Agriculture, forestry and fishing                                                                                          | 19.7% | ↓ | 25.8% | ↗ | 16.7%  | ↓ |
| B. Mining and quarrying                                                                                                       | 31.8% | ↗ | 37.9% | ↗ | 31.8%  | ↗ |
| C. Manufacturing                                                                                                              | 34.8% | ↗ | 50.0% | ↗ | 31.8%  | ↗ |
| D. Electricity, gas, steam and air conditioning supply                                                                        | 31.8% | ↗ | 37.9% | ↗ | 33.3%  | ↗ |
| E. Water supply; sewerage, waste management and remediation activities                                                        | 47.0% | ↗ | 48.5% | ↗ | 39.4%  | ↗ |
| F. Construction                                                                                                               | 48.5% | ↗ | 54.5% | ↗ | 42.4%  | ↗ |
| G. Wholesale and retail trade; repair of motor vehicles and motorcycles                                                       | 45.5% | ↗ | 42.4% | ↗ | 43.9%  | ↗ |
| H. Transportation and storage                                                                                                 | 50.0% | ↗ | 51.5% | ↗ | 47.0%  | ↗ |
| I. Accommodation and food service activities                                                                                  | 77.3% | ↑ | 75.8% | ↑ | 66.7%  | ↗ |
| J. Information and communication                                                                                              | 69.7% | ↗ | 72.7% | ↗ | 56.1%  | ↗ |
| K. Financial and insurance activities                                                                                         | 40.9% | ↗ | 42.4% | ↗ | 47.0%  | ↗ |
| L. Real estate activities                                                                                                     | 62.1% | ↗ | 56.1% | ↗ | 48.5%  | ↗ |
| M. Professional, scientific and technical activities                                                                          | 74.2% | ↗ | 72.7% | ↗ | 74.2%  | ↗ |
| N. Administrative and support service activities                                                                              | 80.3% | ↑ | 71.2% | ↗ | 78.8%  | ↑ |
| O. Public administration and defence; compulsory social security                                                              | 50.0% | ↗ | 45.5% | ↗ | 53.0%  | ↗ |
| P. Education                                                                                                                  | 53.0% | ↗ | 48.5% | ↗ | 62.1%  | ↗ |
| Q. Human health and social work activities                                                                                    | 66.7% | ↗ | 66.7% | ↗ | 63.6%  | ↗ |
| R. Arts, entertainment and recreation                                                                                         | 60.6% | ↗ | 68.2% | ↗ | 60.6%  | ↗ |
| S. Other service activities                                                                                                   | 56.1% | ↗ | 54.5% | ↗ | 62.1%  | ↗ |
| T. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use | 34.8% | ↗ | 28.8% | ↗ | 33.3%  | ↗ |
| U. Activities of extraterritorial organizations and bodies                                                                    | 27.3% | ↗ | 25.8% | ↗ | 25.8%  | ↗ |

**Legend - Out of all countries with available data, the share in employment increased in:**

|                                    |   |                                    |   |
|------------------------------------|---|------------------------------------|---|
| 75 per cent or over                | ↑ | 25 per cent or over (but under 50) | ↗ |
| 50 per cent or over (but under 75) | ↗ | under 25 per cent                  | ↓ |

Source: ILOSTAT (country-level data). Note: Refers to the difference in percentage points in the share of employment in each economic activity from 2005 to 2015 (or the closest years available), based on 66 countries with available data according to the ISIC Rev. 4. Agriculture refers to section A, industry to sections B to F and services to sections G to O.

The preceding table also shows that the relative importance of employment in finance and insurance (section K) has declined in the past decade in 59 per cent of countries with available data, perhaps reflecting the role of the banking and financial sector in the latest global economic crisis and/or the effect of technological change on job growth in these activities. Finance and trade (section G) are the only market services whose share in employment shrunk in over half of countries with available data. The only non-market services witnessing a reduction of their employment share from 2005 to 2015 were activities of households and extraterritorial bodies (sections T and U).

Analysing the gender patterns of trends in the employment distribution by detailed economic activity is also very telling. In fact, the table in the previous page reveals that, although the share in total and female employment of all industrial activities has gone down in the majority of countries under study during the last decade, the share of male employment in manufacturing and construction (sections C and F) has managed to rise in 50 and 55 per cent of these countries, respectively, further enhancing a male-dominated industry. When it comes to the services sector, it is worth noting that the share in female employment of transportation and storage and real estate activities has decreased in the majority of countries under study, despite the fact that these activities have expanded their share in total and male employment in most countries. Furthermore, while the employment share of public administration, defence, compulsory social security and education has increased overall and for females, it has declined for men.

Similarly, to have a more accurate picture of employment patterns by occupation, it is convenient to analyse employment statistics by occupation based on at least the 1-digit level categories of the latest version of the International Standard Classification of Occupations (ISCO-08). Indeed, the table below uncovers some interesting patterns, most strikingly that the increase in the global share of high-skilled employment is being driven by growing shares of professionals and technicians (major groups 2 and 3) while the share of managers (major group 1) declined in the majority of countries under study between 2010 and 2015. At the same time, in contrast to the decrease in the global share of medium-skilled employment, the share of service and sales workers (major group 5) rose from 2010 to 2015 in most countries with data.

#### Percentage of countries where the share of employment increased from 2010 to 2015, major ISCO occupational groups

| Occupations (major groups of the 2008 International Standard Classification of Occupations) | Total |   | Male  |   | Female |   |
|---------------------------------------------------------------------------------------------|-------|---|-------|---|--------|---|
| 1. Managers                                                                                 | 40.6% | ↘ | 35.9% | ↘ | 45.3%  | ↘ |
| 2. Professionals                                                                            | 81.3% | ↗ | 73.4% | ↗ | 84.4%  | ↗ |
| 3. Technicians and associate professionals                                                  | 51.6% | ↗ | 51.6% | ↗ | 48.4%  | ↘ |
| 4. Clerical support workers                                                                 | 31.3% | ↘ | 43.8% | ↘ | 28.1%  | ↘ |
| 5. Service and sales workers                                                                | 54.7% | ↗ | 57.8% | ↗ | 56.3%  | ↗ |
| 6. Skilled agricultural, forestry and fishery workers                                       | 25.0% | ↘ | 34.4% | ↘ | 23.4%  | ↘ |
| 7. Craft and related trades workers                                                         | 40.6% | ↘ | 37.5% | ↘ | 46.9%  | ↘ |
| 8. Plant and machine operators, and assemblers                                              | 29.7% | ↘ | 39.1% | ↘ | 31.3%  | ↘ |
| 9. Elementary occupations                                                                   | 40.6% | ↘ | 46.9% | ↘ | 34.4%  | ↘ |
| 0. Armed forces occupations                                                                 | 28.1% | ↘ | 31.3% | ↘ | 14.1%  | ↘ |

| Legend - Out of all countries with available data, the share in employment increased in: |   |                                    |   |
|------------------------------------------------------------------------------------------|---|------------------------------------|---|
| 75 per cent or over                                                                      | ↗ | 25 per cent or over (but under 50) | ↘ |
| 50 per cent or over (but under 75)                                                       | ↗ | under 25 per cent                  | ↘ |

Source: ILOSTAT (country-level data). Note: Refers to the difference in percentage points in the share of employment in each occupation from 2010 to 2015 (or the closest years available), based on 64 countries with available data according to the ISCO-08. A high skill level refers to major groups 1 to 3, a medium skill level to major groups 4 to 8 and a low skill level to major group 9.

Another salient fact from this table is that the share of managers declined from 2010 to 2015 among men in considerably more countries than among women, a favourable trend in terms of reducing gender segregation in managerial positions.

The patterns observed in the employment distribution by occupation are in line with those of the employment distribution by economic activity: the advancement in stages of development, the innovations in production processes, the growing importance of information and communication technology, the upsurge of tourism, and many other global phenomena all have an impact in both the sectorial and occupational employment distributions, making them follow the same direction.

## Employment by education

Improving levels of educational attainment of the workforce in line with jobs that increasingly demand higher skills and capabilities

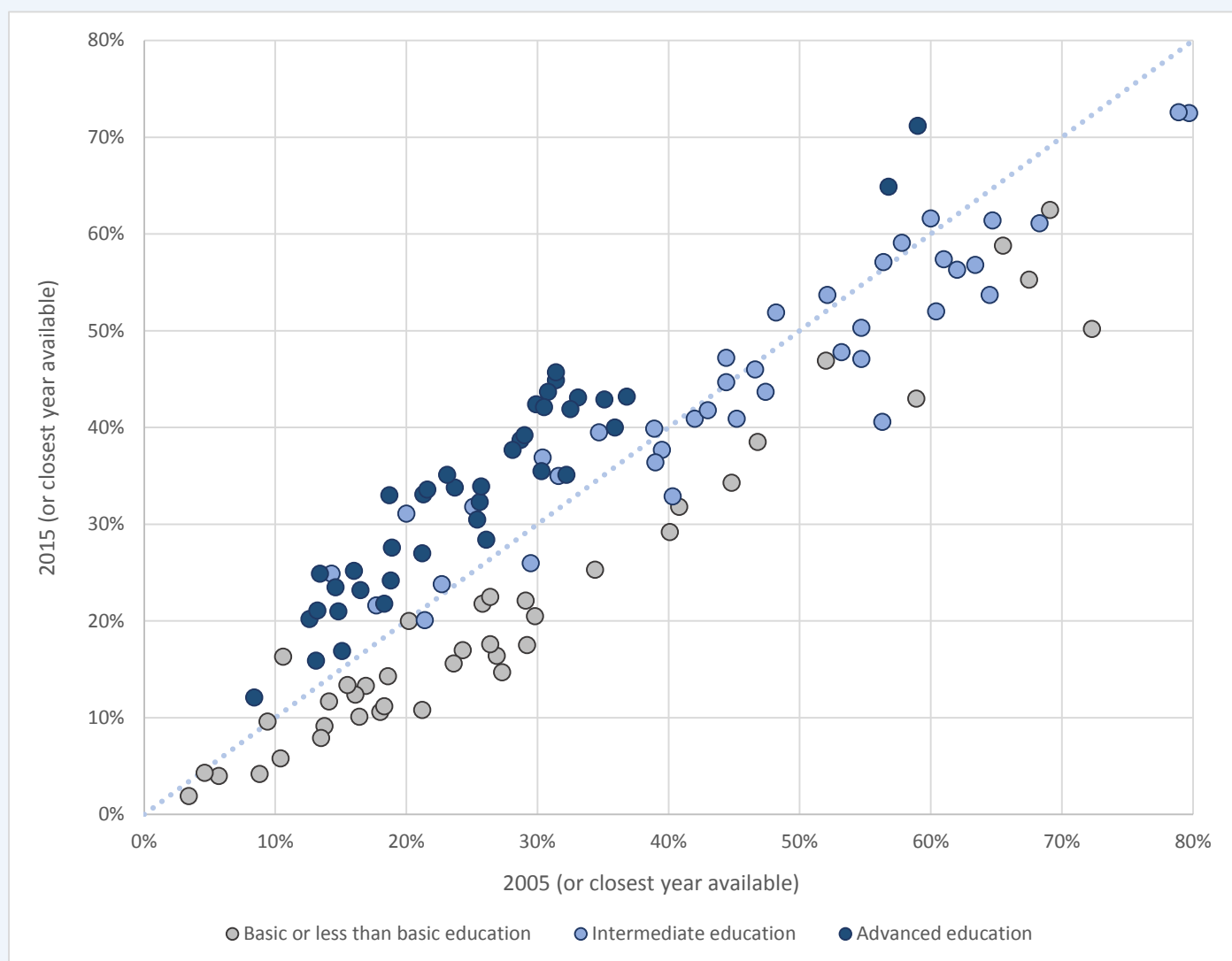
Naturally, the predominant sectors of activity and the level of skills required on the job reflect (and are a reflection of) the educational level of the workforce. As countries move forward in their development stages, with jobs being reallocated from agriculture to industry to services and demanding a higher and higher level of skills, the labour force in general and the employed population in particular improve their levels of educational attainment. These are three factors that evolve together as they are inter-dependent.

In this sense, information on the employed population by level of education provides insights into the human capital dimension of employment, and the extent to which the workforce is ready to fulfil the skills requirements of existing jobs and vacancies.

The figure in the next page demonstrates that, indeed, the educational level of the employed population has followed the upward trend of high-skilled and non-manual employment. In all countries with available data, the share of persons employed with advanced education has increased between 2005 and 2015, while the share of employment with basic or less than basic education has diminished in all these countries but two (Estonia and Norway). The evolution of the share of employment with an intermediate educational level is less straightforward, with more mixed results: it has increased in 43 per cent of countries under study.

This appears natural though, as the improvement in a population's educational level is done gradually, as the years go by, the population ages and the school years are completed. Where it used to be common for people to leave the educational system after reaching a basic level (or less), it is now more widespread to continue to reach (at least) an intermediate educational level, and where it used to be common to leave the educational system after reaching an intermediate level, it is now more common to pursue further studies to achieve an advanced educational level. Thus, although these patterns are visible for the basic and less than basic and advanced educational levels, the conjunction of inflows and outflows obscures the patterns of the intermediate educational level.

## Share of employment by broad level of education, 2005 and 2015



Source: ILOSTAT (country-level data). Note: Data by level of education based on the International Standard Classification of Education (ISCED), with “less than basic” referring to no schooling and early childhood education, “basic” referring to primary education and lower secondary education, “intermediate” referring to upper secondary education and post-secondary non-tertiary education and “advanced” referring to short-cycle tertiary education, bachelor’s or equivalent level, master’s or equivalent level and doctoral or equivalent level.

## Concluding remarks

Global progress towards development evidenced by the upward trend of the shares of employment in services and high-skilled employment, but strong disparities across regions are not expected to disappear soon

Information on the distribution of men and women working across different sectors and occupations is crucial, not only to assess the stage of development each country is at and the main characteristics of its economy and labour market, but also to shed light on the working conditions of employed persons, the opportunities they benefit from in their work life and the types of abilities they are called on to apply in their jobs.

At the global level, the services sector has been gaining ground in terms of its share in employment for many decades now, and this trend is projected to continue, while the relative size of global agricultural employment shrinks.

This goes hand in hand with shifts in the global employment distribution by occupation. Globally, there has been an increase in the past few decades of the share of high-skilled employment, with a diminishing share of medium-skilled employment during the same period. These trends are expected to continue, which means that the level of skills required for jobs is projected to continue to increase on average in the world.

This is reflected by the progressive increase in the educational level of the employed population. The workforce in most countries around the world is pursuing further studies to cope with the growing demand for high-skilled labour.

Understanding these trends is crucial, as they should inform economic and labour market policies. Employment services and educational planning should be designed with these trends in mind, with a view to successfully meeting future skills needs. It is also essential for labour market entrants and jobseekers to be aware of the industries and occupations where the jobs of the future are likely to be.

