Technical annex - World Employment and Social Outlook: May 2025 Update

Estimates of employment elasticities and employment changes

Data: To calculate the elasticity of employment relative to output growth, we merge country-by-year data on employment (in thousands) and Gross Domestic Product (GDP) for the period 2014-2024.

Data on GDP for the years 2014-2024 are expressed in constant 2021 international $ at purchasing power parity (PPP) and are based on the latest data from the IMF World Economic Outlook, April 2025 edition.

Employment figures refer to the total population of adults aged 15 or above. To calculate the elasticity of employment to GDP growth, the analysis relies as much as possible on country-reported data points on employment as available from the ILO Harmonized Microdata collection, a unique collection of harmonized surveys with detailed information on workers and the characteristics of their jobs. The methodological approach leverages five different econometric models that either estimate a log-log relationship between employment and GDP or estimate the relationship between annual growth rates in employment and annual growth rates in GDP. Log-log regressions are estimated using real data for countries with at least two real-data points during the 2014-2024 period, and modelled estimates for employment for countries with less than two real data points. Similarly, growth-growth regressions are estimated using real data for countries with at least six real-data points during the same period of interest, and modelled estimates for employment for countries with less than six real data points. Additionally, depending on the econometric specification adopted, the models either estimate country-specific, region-specific, or income-group specific coefficients for these relationships.

The generic equation to be estimated can be written as follows:

$$\mathrm{f}(EMP_{cgt}) = \alpha_c + \sum_{g=1}^{G} \beta_{cg} \mathrm{f}(GDP_{cgt}) \times \mathbb{I}(group_g) + \varepsilon_{cgt}$$

Where $\mathrm{f}(EMP_{cgt})$ is either the logarithm or the annual growth rate of employment in country *c* in group *g* at time *t* and $\mathrm{f}(GDP_{ct})$ is the equivalent transformation of country *c*'s GDP for year *t*; α_c are country fixed effects; $\mathbb{I}(group_g)$ are interaction terms with either country-specific, region-specific, or income-group specific indicators, depending on the relationship of interest; and ε_{ct} is an error term. β_{cg} are the coefficients of interest, that represent the elasticity of employment to GDP at either the country, regional or income-group level.

To reduce measurement and estimation errors due to data availability constraints, in a second step the country-specific coefficients obtained from the five different models described above are averaged to obtain an average measure of the responsiveness of employment to GDP for each country over the 2014-2024 period ($\hat{\beta}_c$).

Based on these average country-specific elasticities, projected changes in employment for 2025 for each country are calculated as:

$$\Delta EMP^{2025}{}_c = (\hat{\beta}_c \times GDP_{gr}{}_c^{2025}) \times EMP^{2024}{}_c$$

Where $EMP^{2024}{}_c$ is country c's employment estimates for 2024 from the latest ILO Modelled Estimates update; $GDP_{gr}{}_c^{2025}$ corresponds to the estimate for GDP growth in 2025 for country *c* from the IMF World Economic Outlook projections; and β_c is the country-specific average elasticity that was derived from the econometric models.

To quantify the impact of the recent geopolitical and economic uncertainty, projected changes in employment are calculated using GDP growth estimates from GDP growth projections based on both the October 2024 and April 2025

editions of the IMF World Economic Outlook. A comparison between the two numbers reflects the impact of revisions to GDP growth forecasts on projected employment changes for 2025.[1]

To calculate employment changes at the regional and global level, country-specific projected employment changes for 2025 are aggregated at the relevant level.

Estimates of the number of jobs exposed to trade with the United States

The estimate of employment related to trade with the United States is based on input-output modelling. Multi-country, multi-sector input-output tables allow to estimate the value added required throughout the domestic and foreign supply chain to satisfy a certain final demand. The methodology involves multiplying the technical requirement matrix, also called Leontief inverse, with an appropriate demand vector (Timmer et. Al, 2015). For each country and sector, the method yields the share of value added required to satisfy total private and public consumption and investment in the United States. For all countries outside of the United States this value-added share is linked to the United States through international trade. The analysis in this report uses the multiregional input-output tables of the Asian Development Bank (ADB) in its 72 economies version for the year 2023.[2]

The share of employment linked through trade to the US within each of the 35 sectors included in the ADB database is assumed to be the same as the share of value added that has been established to be linked through trade.[3] Employment per sector is derived from the ILO Harmonized Microdata repository, with missing values estimated using an equivalent methodology as is used for the ILO modelled estimates (ILO, 2025).

Estimates of occupational dynamics

International Standards Classification of Occupations (ISCO-08)

Most of the analysis in this report uses the International Standard Classification of Occupations (ISCO-08) at the level of its ten major groups. Due to limited data availability, the major group “0. Armed Forces Occupations” is excluded from the analysis. Additionally, because of reliability concerns in distinguishing between certain types of occupations, major group 6 (Skilled agricultural, forestry and fishery workers) and major group 9 (Elementary occupations) are combined into a single category.

ISCO-08 major groups can be classified by skill level, following international standards (see Table TA1). According to this classification, high-skill occupations typically require tertiary education or equivalent competencies. Medium-skill occupations generally require upper secondary or post-secondary non-tertiary education, while low-skill roles typically require lower secondary education or less and often involve routine manual tasks. As shown in Table TA1, major group 6 is officially considered medium-skill; however, due to classification uncertainties, it is treated jointly with group 9 in this analysis and this combined group is referred to as “low-/medium-skill occupations”.

[1] For oil-exporting countries, there is a strong relationship between oil price forecasts and projected GDP growth, but a smaller relationship between employment growth and oil price changes. To calculate employment growth changes in oil-exporting countries, in the analysis revised growth rate estimates for GDP are used that account for the excess volatility induced by large revisions in oil-price expectations at the beginning of 2025.

[2] The database can be found at https://kidb.adb.org/globalization.

[3] This assumption implies equal productivity between jobs linked to trade and those not linked to trade within a sector and country. Unfortunately, no database of productivity differentials with appropriate coverage exists. There is some evidence that exporting firms are more productive, which would imply an overestimate of employment linked through trade. It should be noted though that many firms might only supply locally to larger exporting firms, a fact that renders a proper estimation of productivity differentials very difficult.

▶ Table TA1. ISCO-08 major groups and skill levels

ISCO-08	Skill level
1. Managers	High-skill
2. Professionals	High-skill
3. Technicians and associate professionals	High-skill
4. Clerical support workers	Medium-skill
5. Service and sales workers	Medium-skill
6. Skilled agricultural, forestry and fishery workers	Medium-skill
7. Craft and related trades workers	Medium-skill
8. Plant and machine operators, and assemblers	Medium-skill
9. Elementary occupations	Low-skill

Note: The table illustrate the correspondence between ISCO-08 major groups of occupations and skill levels.
Source: International Standard Classification of Occupations (ISCO)

Educational (mis)match: Data coverage

The analysis of occupational dynamics and educational mismatches over the last decade leverages data from the ILO Harmonized Microdata collection. The analysis is limited to country-surveys that contain detailed information on the occupational classification of workers, based on the ISCO-08 occupational taxonomy, as well as workers' educational attainment, based on the International Standard Classification of Education (ISCED).[4] Moreover, the sample is restricted to countries that have at least one survey with the required level of granularity for the years between 2010 and 2014, and one survey for the years between 2020 and 2024. This leads to a final analysis sample that includes detailed microdata from 59 countries.

The set of 59 countries included in the analysis, while not representative of the global population, accounts for 22.0 per cent of global employment in 2023. These countries differ from global figures in some ways. Their average GDP per capita is higher (33,392 international dollars) than the global average (20,034 international dollars). In line with this higher level of economic development, the share of informal employment is notably lower in the analysis sample (38.7 per cent) than the global estimate (57.5 per cent). However, these countries show only slight differences in employment-to-population ratio (57.8 per cent vs 55.9 per cent globally) and share of female employment (40.5 per cent vs. 39.8 percent globally). Table TA2 below shows the number of countries covered in the analysis sample across country income groups, as well as the share of employment that they account for within their income group.

[4] Details on the ISCO classification are available here: International Standard Classification of Occupations (ISCO) - ILOSTAT. Details on the International Standard Classification of Education are available here: International Standard Classification of Education (ISCED) - ILOSTAT

▶ Table TA2. Country coverage for available microdata with occupational and educational breakdowns, by income group

Income group	ISCO 1 available data	ILO modelled estimates	Employment coverage
Low income	4	28	31.1%
Lower-middle income	14	53	17.3%
Upper-middle income	9	48	1.7%
High income	32	60	68.9%
Totals	59	189	22.0%

Note: ISCO-1 level available data countries are further limited to those countries that have at least one survey with the required ISCO-1 level breakdown and by level of education for the years between 2010 and 2014, and one survey for the years between 2020 and 2024. The golbal employment coverage uses year 2023 as reference.

Source: Authors' calculations based on ILO Harmonized Microdata collection.

Educational (mis)match: Definitions

Table TA3 shows the correspondence between ISCO-08 major group skill requirements and the levels of educational attainment (based on the ISCED classification). This table can be used to assess whether workers are over-educated, well matched or under-educated for their occupation. For example, a worker with a bachelor's degree in an occupation classified as requiring only upper secondary education (e.g. service and sales workers) would be considered over-educated. Conversely, someone with only primary education employed as a professional would be classified as under-educated. This classification is used throughout the report to track trends in education mismatch and to assess how well the educational attainment of workers aligns with the changing structure of occupations.

▶ Table TA3. Correspondence table between education and occupation based on ISCO-08 educational requirements

Educational matching

Undereducated | Matched | Overeducated

	Early childhood education or less	Primary education	Secondary or non tertiary education	Short-cycle tertiary education	Bachelor, equivalent, or beyond
1. Managers					
2. Professionals					
3. Technicians and Associate Professionals					
4. Clerical support workers					
5. Service and sales workers					
6. Skilled agricultural, forestry and fishery workers					
7. Craft and related trades workers					
8. Plant and machine operators, and assemblers					
9. Elementary occupations					

There are ten education levels that are grouped into five broad categories. "Early childhood education or less" includes (X) no schooling, (0) early childhood education. (1) "Primary education" is a standalone group. "Secondary or non tertiary education" includes (2) lower secondary education, (3) upper secondary education, (4) post-secondary non-tertiary education. (5) "Short-cycle tertiary education" is a standalone group. "Bachelor, equivalent, or beyond" includes (6) bachelor or equivalent level, (7) master or equivalent level, (8) doctoral or equivalent level.

Source: Education and Mismatch Indicators