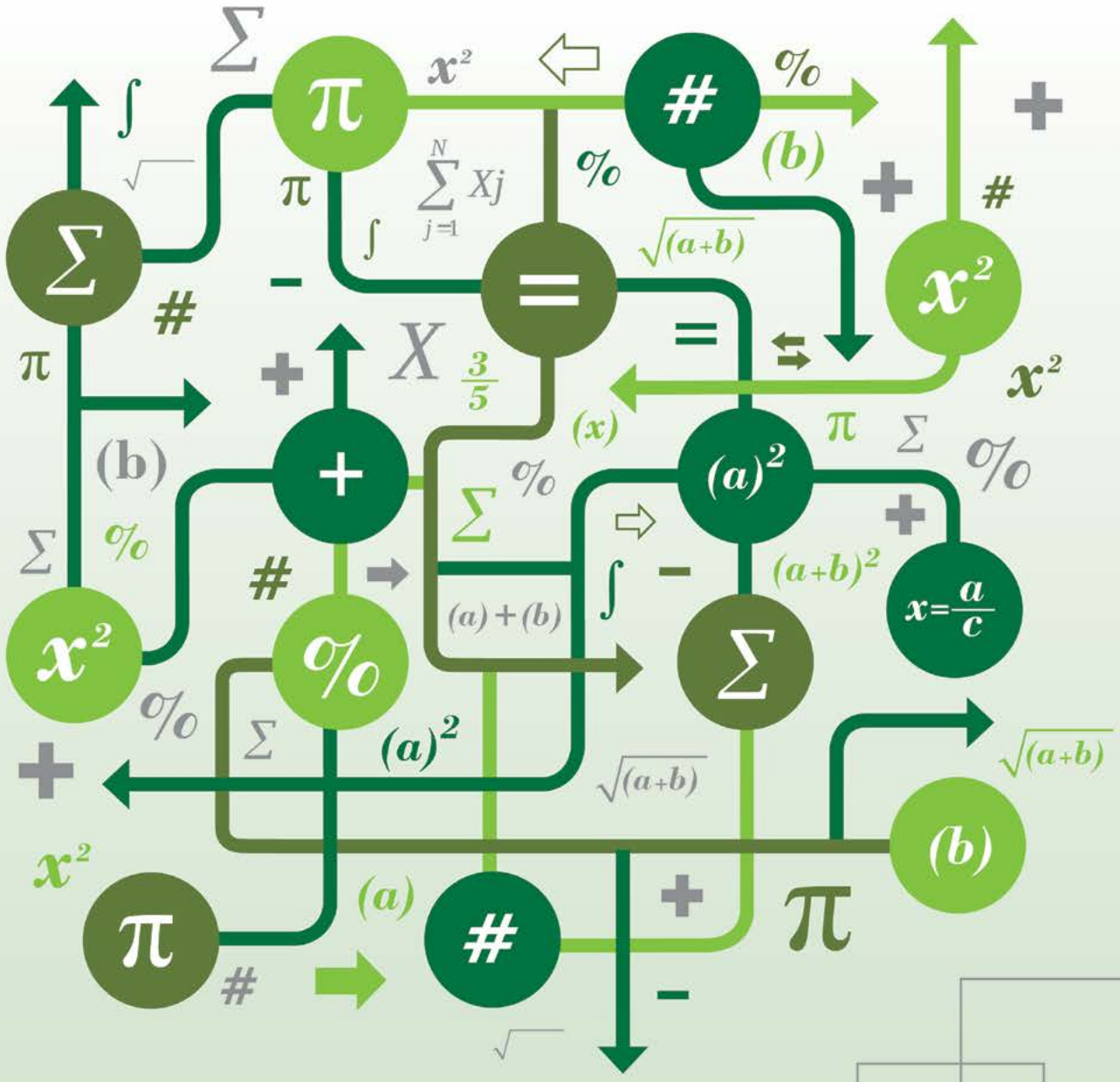
International Labour Office

YOUTH LABOUR MARKET ANALYSIS

A TRAINING PACKAGE ON YOUTH LABOUR MARKET INFORMATION



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YOUTH LABOUR MARKET ANALYSIS

A TRAINING PACKAGE ON YOUTH LABOUR MARKET INFORMATION

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This package was developed to support managers and practitioners engaged in the implementation of youth employment programmes. The material that is contained in the package was validated by the managers of 15 joint programmes on youth employment and migration during two international workshops that took place in early 2011. It was subsequently used for the implementation of labour market information activities of some joint programmes on youth employment and migration of the MDG-F.

The development of the package it is the resultant of a project that involved the preparation of a technical paper and a set of learning modules. This project was coordinated by Mr Gianni Rosas, Senior Youth Employment Specialist of the ILO. Mr Farhad Mehran, Senior Labour Statistician, prepared the technical paper on data requirements and analysis for youth employment policy and programme development. Ms Valli' Corbanese, Senior Youth Employment Expert, adapted the content of this paper and developed the training modules for the package.

The helpful comments and suggestions on the draft technical paper provided by Gianni Rosas, Sara Elder, ILO's Youth Employment Specialist, and Sophia Lawrence, ILO's Labour Statistician, are acknowledged. Gratitude is also expressed to the colleagues of the Secretariat of the MDG-F for their support during the validation workshops and the finalization of this training package.

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Introduction

Objective of the training package and target audience

A comprehensive analysis of the youth labour market is vital for the design of sound and evidence-based youth employment policies. The objective of this training material, therefore, is to provide guidance on the data required and how they may be analysed for the assessment of youth employment at national level.

This training material can be used as a reference tool by the staff of labour market institutions engaged in promoting youth employment at national or local level. It also addresses the needs of analysts of worker and employer organizations, and of independent researchers wishing to undertake data collection and analysis on national youth employment.

Introduction

Structure and content

The material is organized into two broad areas. Module 1 deals with data requirements and availability (which data to look for and what to do if these are not readily available). Modules 2 to 6 deal with data analysis and evaluation (how to analyse the available data and how to interpret the results). Within each broad area, the training modules address the issues of data collection and analysis on youth labour supply, labour demand and conditions of work.

Modules 2 and 3 examine youth labour supply within the labour force framework, in line with ILO international standards concerning statistics on economically active populations, employment, unemployment and underemployment, and its proposed extension for the measurement of labour under-utilization.

Modules 4 to 5 examine youth labour demand using a mirror framework developed around the concepts of jobs and vacancies using data drawn from establishment surveys. Module 6 discusses the measurement and analysis of youth conditions of work, based on the framework of decent work indicators. Finally, Module 7 explores the measurement and analysis of labour force flow data.

Icons used in this training material

Glossary

These sections offer brief explanations of terms used in the training modules.

Additional reading

These sections list the main references used in the training modules for those interested in learning more about the topic.

Examples

These sections use examples to illustrate how the principles, concepts and methods presented in the training modules are applied in practice.

Exercise

These sections present learning activities which allow readers to verify their understanding of the topic (suggested answers can be found at the end of each exercise).

Tips

These sections provide helpful suggestions on how to deal with specific issues relating to the analysis of labour market data.

Module ONE

Sources of youth employment data

At the end of this module, readers will be able to:

- identify the main sources of youth employment data at national level;
- combine different data sources to collect the range of data required; and
- list the main youth labour market indicators needed to analyse the youth employment situation at national level.

Learning exercises:

None.

Duration:

120 minutes.

Labour force surveys

Availability of information on the youth labour market is essential to identify youth employment challenges at national and local level, and to shape policies and programmes to address them. The basic data requirements for the measurement and analysis of youth employment are: a system that comprises national labour force surveys (LFS), regular establishment surveys and administrative records on labour. In many countries, however, availability of labour statistics is modest, especially with regard to specific population categories such as young people (aged 15–24 years old). In response, this module offers a number of potential approaches for users to consider when the full range of data is not available.

A labour force survey (LFS) is a sample survey of households and individuals run by national statistical offices on a regular basis to obtain data on the number of employed, unemployed and underemployed.

These surveys cover basic demographic characteristics of individual household members (e.g. sex, age, educational attainment, marital status), and core labour force variables such as activity status (e.g. employed, unemployed, not economically active), hours of work, main occupation, branch of economic activity, status in employment, reason for not seeking work, job-search methods and past work experience.

More than 170 countries have conducted labour force surveys to date, but not all are run on a regular basis with sufficient back history to permit the analysis of trends.

The first step in examining the sources of youth labour market data, therefore, is to check whether the country has a national labour force survey programme or has carried out a recent labour force survey.

Labour force surveys: Main strengths and limitations

Labour force surveys have a key role in the collection of employment and unemployment data. The information gathered on key labour market variables, such as employment, unemployment and inactivity, can be linked to other topics covered by the survey, for example, education and income.

By measuring changes between and within labour force categories, labour force surveys can be designed to provide not only stock data for a given point in time, but also data on flows and gross changes over time.

The periodicity of the survey should be annual or semi-annual (during peak and slack season). When the survey is not carried out on a regular basis, the resulting youth employment analysis may be negatively affected.

When there are time lags between data collection and dissemination this may undermine the timeliness of analysis.

Since these surveys are household-based they can cover virtually the entire population, all branches of economic activity, all sectors of the economy and all categories of workers – including the self-employed, unpaid family workers, casual workers, young people combining work and school, and workers in the informal economy. An essential feature of labour force surveys is that they allow mutually exclusive measurement of the employed, unemployed and economically inactive.

The longer the labour force survey programme, the longer the time series of employment and unemployment data that can be used, and the richer the historical analysis.

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If there have been changes in methodology over the years, figures collected before and after the change may not be comparable. Even a slight change in the wording of a questionnaire, in data collection methods or in the sample design may cause a significant variation in estimates.

National labour force survey programme

An increasing number of countries conduct regular labour force surveys at national level. The periodicity of the survey can be annual, semi-annual, quarterly or monthly. Certain countries, like India, conduct major labour force surveys every five years with annual updates integrated into other household surveys. Other countries, like most European Union states, conduct quarterly labour force surveys with the sample uniformly spread over the quarter so as to produce monthly estimates. ILO international standards recommend that countries collect and compile statistics twice a year, coinciding with the agricultural peak and slack seasons.

In addition to periodicity, the length of the labour force survey programme and the availability of the latest data should be checked. The length of the programme refers to the start date of the programme relative to the current date. The longer the LFS programme, the longer the time series of employment and unemployment data.[1]

Another element to verify is the occurrence of any major changes in the survey methodology, especially any modifications in the concepts and definitions of the core labour force variables. This is best achieved by reviewing the survey questionnaires for the period of the survey programme. If there have been major changes, the data should be appropriately flagged or – where feasible – adjusted to build a consistent time series for the period. The construction of harmonized time series of labour force data with changing concepts and definitions requires re-processing of the original raw figures (this should be done by the national statistical office itself).

The sample design of the survey programme is also an important feature to verify. The sample size and design determine the degree of precision of the survey estimates. If the survey design includes a rotation sampling scheme, the labour force survey programme can provide not only stock data, but also flow figures across labour force categories and, in particular, between school and work (see Module 7).

[1] Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the Thirteenth International Conference of Labour Statisticians, 1982.

Recent ad hoc labour force survey

A country with no national labour force survey programme may have carried out one or more ad hoc labour force surveys, which can be used to analyse youth employment. A general consideration when analysing youth employment on the basis of a single labour force survey is its timing. The results may differ significantly depending on whether the survey was carried out during school months or during vacation periods.
A recent labour force survey provides a rich dataset to analyse the structure of youth employment. It also provides information on youth unemployment, hours of work and earnings, and on differences between youth in school and dropouts.

Such a survey allows the testing of hypotheses regarding factors affecting youth employment, for example, whether married youth are more likely to be employed than single ones, or whether young school dropouts are more likely to be unemployed than those who completed their education.

To estimate trends and analyse the evolution of youth employment, data from at least two labour force surveys are needed. When these are not available, it is possible to analyse youth employment trends by comparing data from a recent labour force survey with the results of population census.

Population censuses usually cover the same areas of population, use the same type of measurement units (households and individuals), and employ the same concepts and definitions as labour force surveys. There are, however, significant differences, not only in terms of survey scale (complete enumeration versus sampling), but also in terms of differences in methodology, implementation and objectives. The primary objective of a census is to obtain brief, but complete information on the size and basic characteristics of the population, with maximum possible detail for local areas and particular groups of individuals. As a result, only selected topics on economic characteristics are researched in a population census, and the questions used are less extensive than those used for a labour force survey.

If the employment data from the population census are substantially different from those derived from the labour force survey, data from the two preceding population censuses may be used to measure trends, and the results applied to the labour force survey data to obtain aggregate estimates of employment change.

Alternatively, instead of population censuses, one may combine the results of the ad hoc labour force survey with data from other national household surveys, carried out in the recent past, that cover employment and unemployment characteristics of household members (e.g. household income and expenditure surveys, demographic surveys, health surveys or general multi-purpose living standards surveys).

No recent labour force survey

When there is no recent labour force survey, a preliminary analysis of youth employment can be made using figures drawn from population censuses or other national household surveys.

A better procedure, however, is to attach a labour force module to an existing household-based survey programme. The objective of attaching an LFS module to existing surveys is to measure employment and unemployment using concepts and methods as close as possible to those employed in a fully fledged labour force survey. This approach may be a cost-effective means to gather essential information on the youth labour force and its characteristics, especially if a fully fledged labour force survey cannot be undertaken.

The module approach, however, has certain drawbacks. First, there are limits to the number of labour force items that can be inserted into surveys focused on other topics. Care must be taken to ensure that such additions do not affect the quality of the data gathered. Second, it is necessary to ensure that the topics included in the survey are compatible in terms of concepts, definitions, survey methods, reference periods, coverage and other design requirements. For instance, it is not always possible to achieve compatibility between a labour force module that uses a one-week reference period and a labour migration survey that uses a longer reference period.

Another approach is to integrate labour force data collection into a multi-subject survey that combines a number of detailed topics, for example, the World Bank's Living Standards Measurement Study (LSMS). These surveys can, however, suffer from a number of drawbacks, such as increased length of interviews, heavier response burden, increasing non-sampling errors, reduced efficiency of design, and delays in data processing. Some of these problems may be tackled by using different sub-samples or by organizing data processing separately for different sets of topics. An alternative approach is to conduct a specially designed survey, such as the ILO School-to-Work Transition Survey.

Figure 1.1.
Labour force survey programme and options

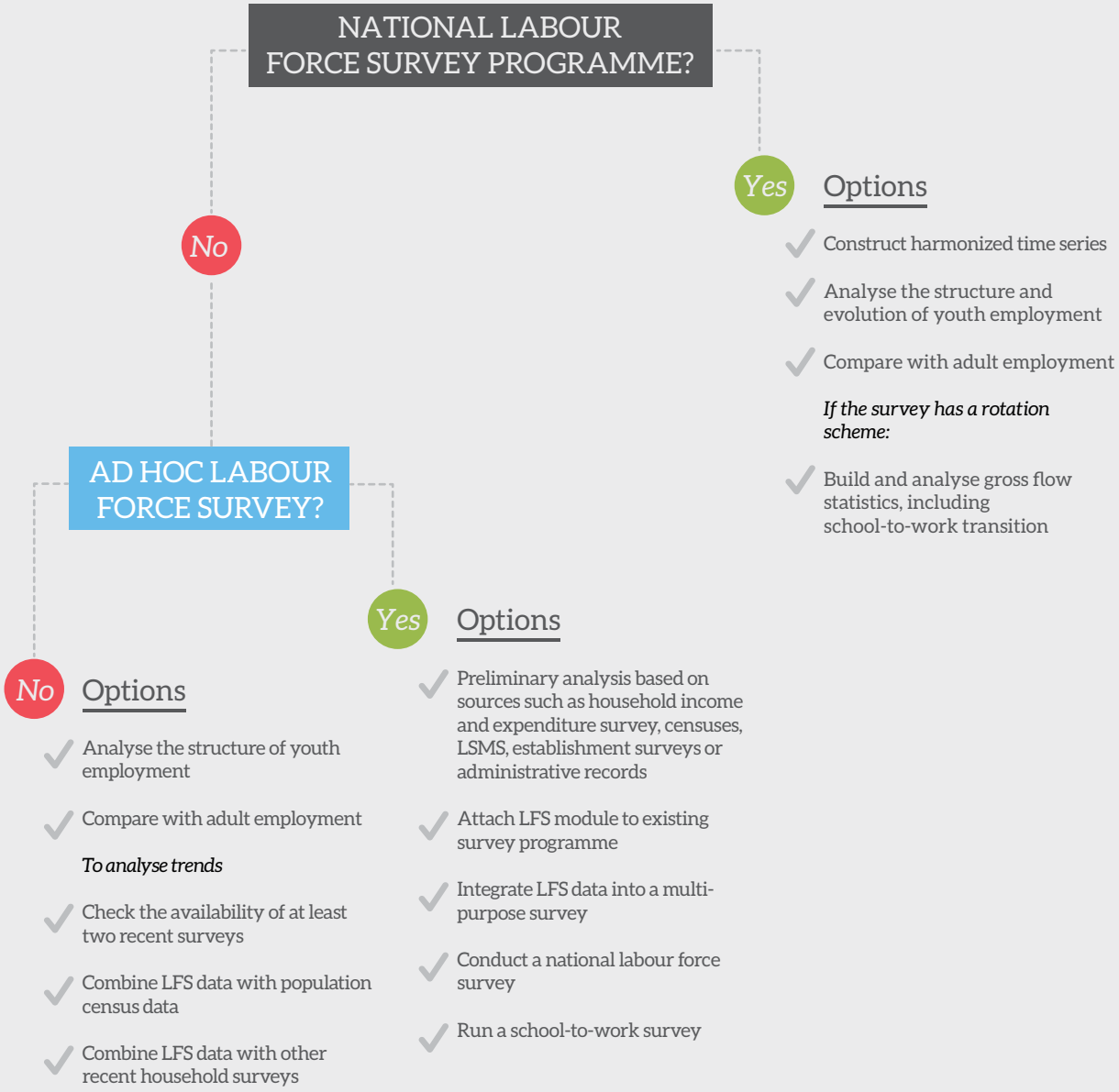


Figure 1.1 summarizes the use of national labour force surveys and the options that may be considered when such a programme is not available.

Establishment surveys

Data on youth employment may also be obtained from establishment surveys, as distinct from labour force surveys and household surveys in general. An establishment survey is a survey of businesses to obtain data on their characteristics and operations. They differ from household surveys with regard to the units of measurement and the scope of the information collected. While data obtained from household-based surveys concern primarily the supply side of labour, data from establishment-based surveys are more appropriate for analysis of labour demand.

There are different types of establishment surveys each designed to obtain specific information (e.g. on production, employment and average earnings; skill level and wages; jobs and vacancies; future employment prospects and so on).

Establishment surveys: Main strengths and limitations

Establishment surveys are characterized by very specific coverage and content, and can provide more reliable information on topics such as earnings, skills, occupation and industry than labour force surveys. These surveys also usually collect information on future labour demand, and hiring and firing practices.

Establishment surveys have limited ability to cover small establishments. List frames are generally not available for small businesses, which are characterized by high fluctuations and often lack recognizable features. The only feasible approach to cover small establishments is the conventional household survey using multi-stage sampling of areas with special listing of establishment units.

Establishment surveys are less costly than labour force surveys. This is because the establishments tend to be congregated together and are thus easier to contact. In addition, establishment surveys can make use of cheaper methods of data collection, such as telephone interviews, whereas labour force surveys often use more expensive methods such as face-to-face interviewing. In the case of establishment surveys, information on individuals employed in a large establishment can also be provided by a single respondent, further reducing costs.

Characteristics of individual workers such as age, educational level and marital status are often not available or not sufficiently accurate at the establishment level. Therefore, measurement of youth employment on the basis of establishment surveys often requires two levels of sampling. At the first level, a sample of establishments is drawn from a list frame, and then a second-level sampling is carried out to draw a sample of workers from all individuals employed in sample establishments. In such cases, it is important to ensure the consistency of the sampling weights of the workers and those of the establishments.

Surveys on employment and earnings

Establishment surveys on employment and earnings form the core element of national statistical programmes on labour-related surveys. Such surveys provide data on the number of paid employees, the average wages paid, and in some cases, the average number of hours worked. These surveys do not generally collect data at the level of individual employees and, therefore, do not provide specific data on young workers.

The main objective of establishment surveys on employment and earnings is to provide data to measure trends and short-term changes in industry employment, average earnings and hours of work. These surveys collect data on employment, payroll and, in some countries, hours paid. They often form the main source of current data on employment and wages at detailed industry levels and geographical regions.

Data are generally collected from employers on the basis of payrolls, thus the employees concerned are those receiving pay during the reference period. In some instances, the survey also covers the working proprietors, partners working regularly in the unit and contributing family workers.

The employment data drawn from these establishment surveys provide information on expanding and contracting industries.

The wage data provide information on average weekly or monthly earnings, as well as on average hourly earnings if data on hours of work are also collected. To monitor changes in earnings (and hours of work), real earnings can be calculated using price deflators, such as the Consumer Price Index (CPI). In addition, indices of aggregate weekly or monthly earnings (and weekly hours) can be constructed to monitor wage trends.

Surveys on employment and earnings: Tips

- Establishment surveys may also provide information on the type of jobs that employers require and the type of jobs that are potentially available to young individuals. To obtain these data the questionnaire poses either direct questions on new hiring or indirect questions to employees on the number of months or years of work experience in the establishment. Employees with less than one year with the establishment are considered as new hiring.

- Establishment data may also be used for the analysis of education and training curricula; the development of vocational counselling and guidance programmes; the study of occupations with a high concentration of young workers; the preparation of occupational projections; the evaluation of demand for industry skills and the assessment of competitive wages.

- The data on new hiring may be analysed by size of establishment or by branch of economic activity or any other relevant characteristics of the establishment. If the establishment survey also collects data on individual employees, the analysis of new hiring may be extended to the characteristics of workers (e.g. sex, age, educational attainment, occupation, hours of work and wages).

Surveys on job vacancies

Establishment surveys on job vacancies are specialized surveys designed to measure the total stock of job vacancies across an economy. Job vacancies measure the unsatisfied demand for labour and, in this sense, act as the mirror image of unemployment. While an unemployed person represents an unutilized supply of labour, a vacant job represents an unsatisfied demand for labour. Vacancy data drawn from establishment surveys provide a more comprehensive picture of labour demand than data on job vacancies obtained from the administrative records of the employment service.

The parallel between job vacancies and unemployment provides the basis for a precise definition of job vacancies in line with the three criteria of the international standard definition of unemployment. Thus, a job position is defined as a vacancy if:

- The position is not filled (newly created or unoccupied or identified as becoming vacant in the near future);
- Active steps have been taken to fill the position, such as advertising the vacancy in the media, registering with a public or private employment agency or interviewing potential recruits; and
- It is available for a suitable candidate immediately or in the near future.

Job vacancy data may be analysed by branch of economic activity and size of establishment. In surveys where information on the nature and type of vacancies is collected, a more detailed analysis may be carried out by occupation and wage level, or by type of employment contract (part- and full-time, permanent and temporary).

The number of job vacancies may be linked to the aggregate number of employee jobs in a given occupation to calculate vacancy ratios (e.g. number of vacancies per 1,000 employee jobs in manufacturing). Trends over time may be compared to the corresponding time series on unemployment, allowing one to draw conclusions on the relationship between supply and demand for labour.

United Kingdom: Job vacancy surveys

Since the early 2000s, the United Kingdom has conducted establishment-based surveys on vacancies on a monthly basis by means of telephone data entry by employers. The surveys use a sample of 6,000 businesses, according to a rotation scheme depending on the size of the business.

The survey count includes vacancies for: full-time and part-time positions; permanent and fixed-term jobs; casual workers employed to cover temporary absences such as maternity leave or long-term sickness; and newly created jobs or positions resulting from retirement, resignation or promotion. The count excludes: positions intentionally left vacant of temporarily absent employees who will be returning from paid or unpaid leave; vacancies due to reorganization within the business that are not opened to external applicants; unpaid or involuntary jobs; vacancies for which a job offer has already been accepted; vacancies for work to be undertaken by subcontractors and vacancies for positions outside the country.

Source: UK National Statistics at
www.statistics.gov.uk/hub/labour-market/job-statistics/vacancies

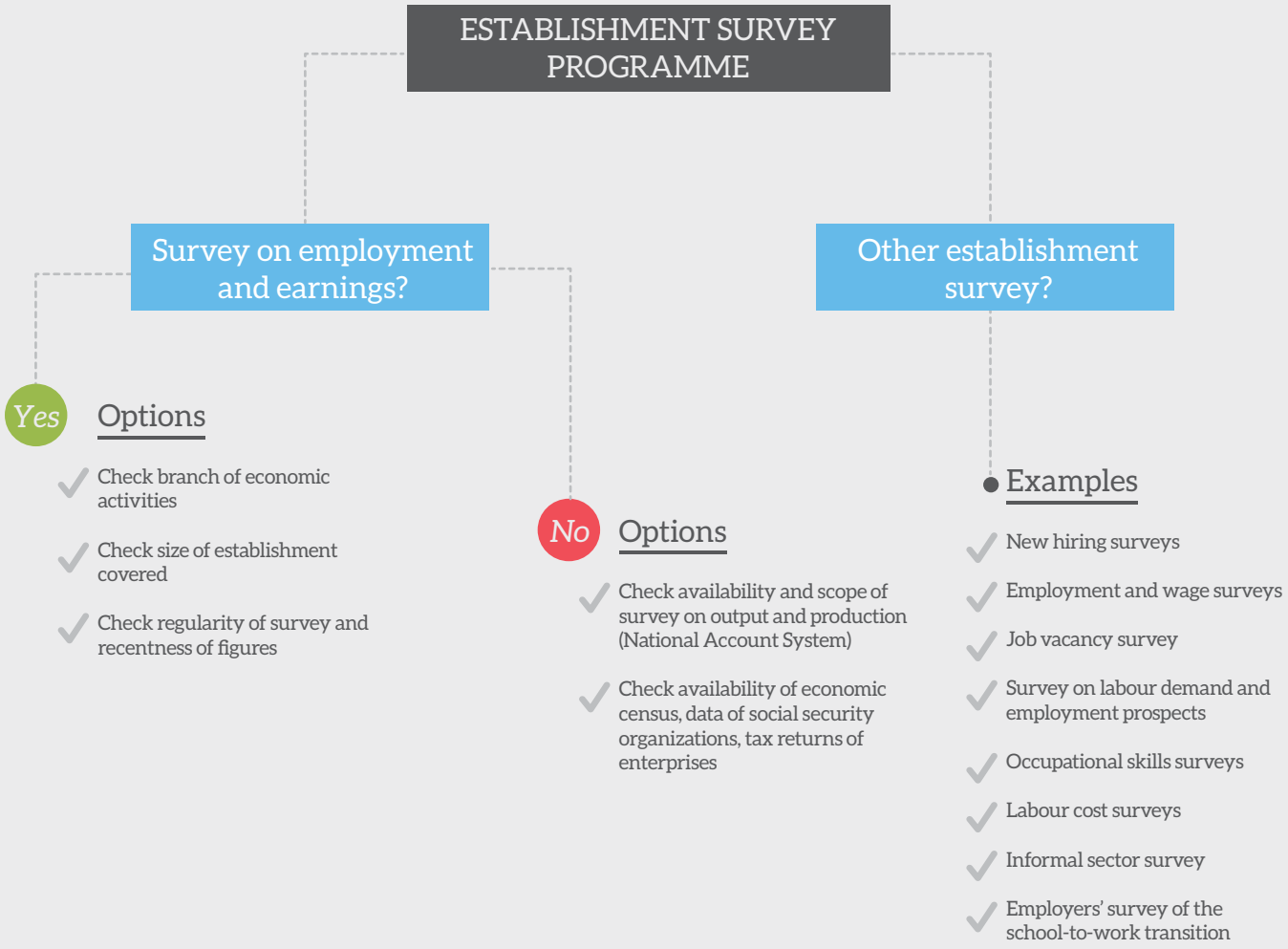
Occupational skills surveys

Occupational skills surveys (also called *employer skills* or *skills needs surveys*) are establishment surveys primarily geared to identifying emerging occupations and the skills these require. The table below provides a snapshot of the objectives, data and indicators stemming from such surveys. While a regular establishment survey encompasses only the first and second objective, the skills needs survey also investigates the skills of newly employed workers and those required for future recruits.

Occupational skills survey: Objectives, data and indicators

SURVEY OBJECTIVES	SPECIFIC INFORMATION GENERATED	INDICATORS
1. Which sectors of the national/local/ regional economy are growing and are likely to require additional workforce (and which sectors are declining)	Enterprise developments (short term)	Turnover trends in short/mid-term
		Economic performance of enterprises
	Emerging and developing sectors	Newly created jobs
	Trends in recruitment	Current structure of workforce by type of contract, age, sex and level of education
		Inflow and outflow of workforce by main reasons
		Inflow of youth aged 15–24
		Inflow of workers with disabilities
		Inflow of unemployed registered with PES
2. Which types of occupations are likely to be required by expanding sectors/enterprises	Assessing skills shortages	Current vacancies by occupation and skills required
		Average duration of vacancies
		How companies plan to fill existing vacancies
		Reasons for which some posts are hard to fill
	Planned employment next period (12 months and/or or 3–5 years)	Planned increasing and decreasing of workforce by occupations
3. Which skills and knowledge are required by emerging occupations/ economic sectors	Which occupations opened and which vocational and non-vocational skills required	Occupations opened the previous year
		Required skills and knowledge for individuals employed during the previous year (vocational/non-vocational)
		Planned employment by occupation and required skills and knowledge
	Assessing the skill gap	Level of employers' satisfaction with skills/knowledge of persons employed during the previous year
		Preferred strategies to fill the skills gap

Figure 1.2.
Establishment survey and options



School-to-work transition surveys

Since many countries are unable to maintain large statistical programmes, the ILO has developed a methodology to conduct school-to-work transition surveys (STWS) to collect detailed information on the labour market situation of young people as they leave the education system. The STWS is a framework that combines two surveys: one addressing young people (labour supply and conditions of work) and the other targeting employers (labour demand). The survey measures the transition – from the end of school to the first regular or satisfactory job – of young people aged 15–29 years old. Young people are classified into three categories, namely:

- **Transited:** currently employed in a regular or satisfactory job;
- **In transition:** currently unemployed, employed in a temporary or unsatisfactory job or inactive and not in school but aiming to look for work shortly; and
- **Transition not yet started:** youth still in school or currently inactive with no intention of entering the labour market

The school-to-work transition framework provides the basis for obtaining most youth labour supply and condition of work indicators, while the accompanying employers' survey investigates current and future labour requirements. The combined results of the two surveys provide information on mismatches in the supply and demand of young labour and can guide policy development.[2]

[2] The ILO's School-to-work transition survey: A methodological guide (2009) provides the questionnaires, guidelines and other tools to design and implement the research at national/regional level.

Administrative data

The set of administrative data typically used to analyse the youth labour market are labour and education figures. Labour-related administrative data can be obtained from social security organizations, public and private employment offices, unemployment insurance schemes and civil service administrations.

A particular set of administrative data used in the analysis of youth employment are drawn from the figures of Public Employment Services on the implementation of active labour market programmes targeting registered unemployed (employment services, labour market training, employment subsidies, public works programmes and self-employment schemes). Data on the number and characteristics of beneficiaries helps to monitor the effectiveness of programmes, while impact is measured on the basis of the number of beneficiaries who are employed following participation compared with the employment figures of a control group.

Data from the national education system provide information on the quality and skill level of the new entrants in the labour force. These data record literacy rate, educational attainment, school enrolment ratios and dropout rates (these indicators are analysed in detail in Module 2).

Administrative data: Main strengths and limitations

Administrative data can be a cheap and efficient source of statistical information. As these data follow the target population over periods of time, they can be a useful source of flow statistics and other longitudinal data, as well as detailed local level data.

In countries with unorganized labour markets, administrative sources such as unemployment insurance and employment exchange records are often non-existent or limited to narrowly defined categories of workers.

Administrative figures often suffer from limited coverage of the national population, inflexibility of concepts and definitions tied to administrative regulations, inconsistency of auxiliary data not related to the operations of the administration, and restricted access due to legal and administrative constraints.

Combining data sources

No single source of data will provide all the information necessary for an analysis of youth employment. Data from different sources have to be combined to obtain a full understanding of the multiple aspects of the youth labour market. In some cases, data from different sources can be combined to produce a new and enhanced dataset.

Combining data from different administrative sources or blending administrative data with survey data may be done to improve coverage of sources, or to allow the borrowing of variables from one or more sources (donor sources) for another (recipient source) to enrich the analysis.

Combining data from labour force surveys with data from household budget surveys can also enrich analyses of the youth labour market. These latter surveys are designed to measure household consumption expenditure and income (from paid and self-employment and sources such as pensions, social security benefits and remittances from abroad). The combination of these two surveys is normally used to measure the working poor (i.e. the share of the working population whose earnings are below the national poverty line).

Where income data exist at the individual level and the household budget survey is conducted on the same sample, or a sub-sample of households used for the labour force survey, the LFS employment data and the income from employment data of the survey can be linked at the individual record level. If the questionnaire has adequate household and individual identification numbers, the key issue is to calculate appropriate sampling weights to ensure consistent aggregate estimates for the employed population. Where income data are at the household level or the household budget survey is conducted on a sample other than the LFS, the link between the two datasets is possible only at the aggregate level (e.g. for geographical regions).

Youth labour market data requirements

Table 1.1 summarizes the labour market indicators necessary for a comprehensive analysis of the youth labour market and lists the possible data sources. The following modules provide further details on these indicators.

Table 1.1 Youth labour market data requirements and sources

	Area of research	Indicator	Data source
SUPPLY	Population	- Share of children (aged 0–14) and youth (aged 15–24 or 29) out of population - Dependency ratios	Population census
	Education	- Literacy rates - Educational attainment - Gross and net enrolment rates	Administrative data (education)
	Labour force	- Youth labour force participation rate*	LFS
	Employment	- Youth employment-to-population ratio* - Share of part-time/full-time young workers - Youth temporary work	LFS
	Unemployment	- Youth unemployment rate* - Youth unemployment ratio - Youth long-term unemployment rate - Youth-to-adult unemployment rate ratio - Time-related underemployment*	LFS
	Inactivity	- Youth inactivity rate - Share of inactive youth by reason of inactivity - Share of discouraged young workers - Youth not in employment, education or training (NEET)	LFS
DEMAND	Branch of economic activity	- Youth employment by branch of economic activity	LFS
	Occupation	- Occupation and education mismatch - Top occupations for youth	LFS
	Status in employment	- Youth by status in employment*	LFS
	Job vacancies	- Job vacancies by branch of economic activity, enterprise size and occupation - Job vacancy rate	Establishment survey (job vacancy)
CONDITIONS OF WORK	Hours of work	- Hours of work worked by employed youth/week* - Annual hours of work for youth* - Share of youth working excessive hours*	LFS
	Income from employment	- Youth average earnings (day or month) - Share of youth working with low pay rates* - Share of youth working in vulnerable employment - Share of young working poor* - Gender wage gap*	LFS Establishment surveys (occupation and wages) Household income and expenditure survey
	Informal employment	- Share of youth working in the informal economy*	LFS Informal sector surveys
	Decent work	- Child labour - Hazardous child labour - All above indicators marked with an asterisk	Population census LFS
	MDG employment indicators	- Growth rate of GDP per person employed - Employment-to-population ratio - Proportion of employed people living below $1.25–2.00 (PPP) per day - Proportion of own-account and contributing family workers	National accounts LFS Household income and expenditure survey

Additional source of labour market information

In addition to national sources, a number of information sources provided by international entities may prove useful in compiling youth labour market assessments:

United Nations: population estimates and projections by country are available at http://esa.un.org/wpp/unpp/panel_indicators.htm

UNESCO Institute for Statistics: education figures by country are available at http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=198&IF_Language=eng

World Bank: economic, social and education data, aggregated by country and region, are available at http://data.worldbank.org

ILO: key indicators of the labour market (KILM) are available at http://kilm.ilo.org/KILMnet/

ILO: labour market diagnostics are available from the organization's Employment Policy Department (see also the publications of ILO regional offices)

The web pages of regional organizations also provide a variety of data that can be used for analyses of the youth labour market:

African Development Bank: economic and financial governance publications, research by country, are available at www.afdb.org/en/topics-and-sectors/sectors/economic-financial-governance/

Asian Development Bank: economic research, operations by country, are available at www.adb.org/countries/main

Inter-American Development Bank: macroeconomic research and data are available at www.iadb.org/en/research-and-data/research-data,1612.html

European Bank for Reconstruction and Development: economic research and data are available at www.ebrd.com/pages/research/economics/data.shtml

Lastly, the following institutions provide access to national surveys:

ILO: LFS information by country and links to national sources are available at www.ilo.org/dyn/lfsurvey/lfsurvey.home

World Bank: national Living Standards Measurement Studies are available at www.worldbank.org/lsms

Glossary

Labour Force Survey (LFS)
A labour force survey is a survey conducted on members of a household aged 15 years and older to gather information on individuals and core labour market variables (activity, employment, unemployment). These surveys provide cross-sectional data (e.g. figures at a specific point in time).

Household income and expenditure survey
This survey focuses on household expenditure on goods and services to give a picture of living conditions in a country. The data from these surveys are broken down by household characteristics, such as income, socio-economic characteristics, size and composition.

Establishment survey
These surveys are carried out to collect information on enterprises (e.g. characteristics, branches of economic activity, workforce composition, wages, occupations, hiring and labour costs).

School-to-work transition survey
This is a framework that combines two surveys. One addresses young people and is designed to collect detailed information on their labour market situation as they leave the education system. The second is an establishment survey to gather information on enterprises, their workforce, recruitment practices and employment prospects.

Administrative data
These data comprise information collected by public administration authorities on individuals carrying out their functions and/or providing services. They provide longitudinal figures (i.e. they follow individuals over a period of time).

Multi-purposes survey
These household-based surveys investigate a number of issues (living conditions, education, health, employment) at the same time.

Sampling weights
Sampling weights correct for imperfections in the sample that might lead to bias between the sample and the reference population. Weights are normally used to adjust the sample distribution for key variables of interest (e.g. age, race and sex) to make it conform to a known population distribution.

Vacancy ratio
This ratio is the number of vacancies per 1,000 individuals employed in the same industry. It serves to identify expanding and contracting sectors.

Vacancy rate
This rate measures the percentage of vacant posts compared with the total number of occupied and unoccupied posts.

$$\text{Vacancy rate} = \frac{\text{(N.° of vacancies)}}{\text{(N.° of employees + N.° of vacancies)}} \times 100$$

Additional reading

P.M. Getz and M.G. Ulmer: "*Diffusion indexes: a barometer of the economy*" (Washington, DC, US Bureau of Labor Statistics, 1990). Available at: www.bls.gov/mlr/1990/04/art3full.pdf R. Hussmanns, F. Mehran and V. Verma: *Surveys of economically active population, unemployment and underemployment. An ILO manual on concepts and methods* (Geneva, ILO, 1990).

E. Hoffmann: "*Measuring the demand for labour*", in *ILO Bulletin of Labour Statistics* (Geneva, ILO, 1992–91).

ILO: *An integrated system of wages statistics, A manual on methods* (Geneva, ILO, 1979).

ILO: *Methodological questionnaire on household income and expenditure statistics, sources and methods: Labour statistics, Volume 6*, (Geneva, ILO, 1996–2010). Available at: http://laborsta.ilo.org/applv8/data/SSM6/E/SSM6.html

ILO: *Labour statistics based on administrative records. Guidelines on compilation and presentation* (Geneva, ILO, 1997). Available at: www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_087895.pdf

ILO: *School-to-work transition survey: A methodological guide* (Geneva, ILO, 2009). Available at: www.ilo.org/employment/areas/youth-employment/work-for-youth/WCMS_191853/lang--en/index.htm

ILO: *Guide to the new Millennium Development Goals employment indicators* (Geneva, ILO, 2009). Available at: www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_110511.pdf

ILO: *Key indicators of the labour market (KILM)* (Geneva, ILO, 2011). Available at: http://kilm.ilo.org/KILMnet/

ILO: *Global employment trends for youth* (GET Youth) (Geneva, ILO, 2013).

F. Mehran: *Employment data for the measurement of living standards*, Living Standards Measurement Study, Working Paper No 9 (Washington, DC, World Bank, 1980).

B. Timmermans: *The Danish integrated database for labor market research*: Towards demystification for the English speaking audience, DRUID Working Paper No. 2010-16. Available at: www3.druid.dk/wp/20100016.pdf

UK Commission for Employment and Skills: *Employer skills survey 2011*. Available at: www.ukces.org.uk/publications/employer-skills-survey-2011

Module TWO

Labour supply: Youth population, educational attainment and labour force participation

At the end of this module, readers will be able to:

- determine the size and structure of the country population;
- review the educational level of the youth population and its evolution over time; and
- analyse the labour force participation of young people and draw implications for employment policies.

Learning exercises:

Educational trends, dropout and entry in the labour market Labour force participation: Rates and levels.

Duration:

180 minutes.

Youth population

The youth population constitutes a vital part of a country's human capital and defines its potential labour supply. From an economic standpoint, the youth population is a factor of production and its skill level contributes to the productivity of the national economy.

The international definition of the youth population is: "persons aged 15–24 years old". However, in countries where entry into the labour market occurs at a later age, the definition may be extended to young adults aged 25–29 years old. In this case, the following categories should be distinguished to allow for international comparison: teenagers (15–19 years old), young persons (20–24 years old) and young adults (24–29 years old).

Population censuses or a recent national household survey can be used to provide the size and structure of a country's population. Population developments should be reviewed by five-year age group and sex, for the last 20 years, as well as population projections for the next decades. This serves to approximate the number of jobs the economy needs to create to absorb new labour market entrants, as well as assess the implications of increases/decreases in the shares of children and youth for future social and economic policies. National figures can be compared against regional or world population estimates, published regularly by the Population Division of the UN Department of Economic and Social Affairs (UNDESA).

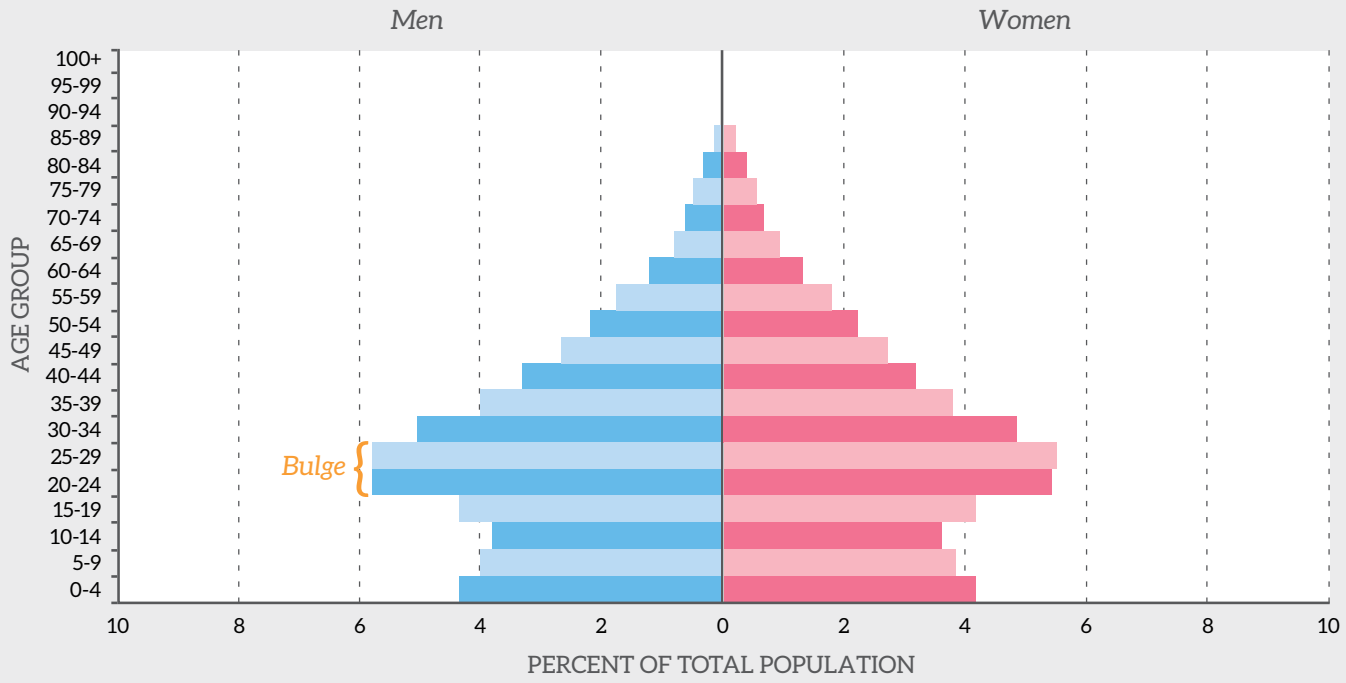
Age pyramid

The evolution of the youth population and its relative position with respect to the size of other age groups can be analysed through a population age pyramid.

The population pyramid may take different shapes: a round belly-shaped pyramid indicates a combination of low fertility and low mortality; a top heavy pyramid indicates an ageing population with a higher number of people in each age group than the next lowest age group; and a symmetrical pyramidal shape indicates a population with a high birth rate, a high death rate and a short life expectancy.

The age pyramid in the following example exhibits a youth bulge, that is, a large share of youth aged 15–29 years old relative to the population in the lower age groups (0–14 years old). This is the result of high fertility experienced in previous decades, with a sharp fall thereafter (evidenced by the narrow base of the age pyramid, below the youth bulge).

Population pyramid with a youth bulge



Dependency ratios

Other indicators to analyse when reviewing population data are dependency ratios, that is, the share of children (aged 0–14 years old) and elderly persons (over 65 year old) over the working age population (aged 15–64 year old). A high dependency ratio indicates that the economically active population and the overall economy face a greater burden to support and provide the services needed by children and by older persons who are economically dependent. As fertility levels decline, the dependency ratio falls initially because the proportion of children decreases, while the proportion of the population of working age increases. The period when the dependency ratio declines is known as the “window of opportunity” when a demographic dividend may be reaped because society has a growing number of potential producers (individuals in the working age) relative to the number of consumers (dependent individuals). However, as fertility levels continue to decline, dependency ratios eventually increase as the proportion of working age starts declining and the proportion of older persons continues to increase.

The next example shows the child and old-age dependency ratios of three different countries with a short explanation of their meaning.

Dependency ratios

COUNTRY	TOTAL	CHILD RATIO	OLD AGE RATIO	SIGNIFICANCE
Country A	49%	34%	15%	The share of children still exceeds the share of elderly persons, but the demographic dividend will soon come to an end
Country B	55%	47%	8%	The working age population exceeds the share of children and elderly persons. There is a demographic dividend (higher number of individuals who will enter working age, compared to elderly individuals)
Country C	52%	21%	31%	The population is aging and not being replaced by the share of children. This means an increased burden for the working age population to pay for the old-age pension system.

Tips

Age pyramids can be constructed or downloaded for specific countries by using an online population pyramid generator. National data are entered into a Microsoft Excel sheet to produce a pyramid graph (see, for instance, http://populationpyramid.net/).

If recent national figures are not available, it is possible to download estimates from the web page of the UN Population Division (at http://esa.un.org/wpp/unpp/panel_indicators.htm).

The US Bureau of Census also maintains a database of international data and provides a function to generate population pyramids by country and world region (at www.census.gov/population/international/data/idb/informationGateway.php).

Youth education

While the population defines the potential size of the youth workforce, education determines its quality and attributes. There is a two-way relationship between the education system and the labour market.

The education system supplies the labour market with an educated workforce for the national economy, while the labour market – through the wage structure of occupations and other labour market variables – transmits signals on the types of qualifications expected from the education system.

The education indicators typically analysed in a youth labour market assessment are:

- ***Youth literacy rate:*** the percentage of youth aged 15–24 (or 29) years old who can read, write and make simple calculations (numeracy);
- ***Gross enrolment ratios:*** the number of children enrolled in a certain education level, regardless of age, divided by the population of the age group that officially corresponds to the same level;
- ***Educational attainment***, for example, the highest grade completed by an individual; and
- ***Dropout rate:*** the share of pupils from a cohort enrolled in a given grade in a school year who are no longer enrolled in the following school year.

To analyse youth employment, it is usually sufficient to compile data on educational attainment of the youth population for three levels of education: primary, secondary (general and vocational) and post-secondary. Wherever possible, national education levels should be presented according to the 1997 International Standard Classification of Education (ISCED) classification as shown in the next page.

Educational attainment is closely related to the skills and competencies of a country's population, and is therefore seen as a proxy of both the quantitative and qualitative aspects of the stock of human capital.

The indicator also reflects the structure and performance of the education system and its accumulated impact on human capital formation. National indicators are typically compared with regional averages (or against the data of neighboring countries, or those of countries in the same income bracket).

Enrolment ratios point to the level of participation in a given level of education and the extent of education services' coverage for children and youth.

Educational attainment categories and sub-categories (ISCED-97)

Primary education	ISCED level 0	Pre-primary education
	ISCED level 1	Primary education
Country B	ISCED level 2	Lower secondary education
	ISCED level 3	(Upper) secondary education
Country C	ISCED level 4	Post-secondary non-tertiary education
	ISCED level 5	First stage of tertiary education
	ISCED level 6	Second stage of tertiary education

Tips

Education figures by country and regional grouping can be found on the websites of the UNESCO Institute for Statistics (at http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=198&IF_Language=eng) and the World Bank (http://data.worldbank.org/topic/education)

Another comparison that may be useful for assessing the performance of the education system is to verify the educational attainment of young people (aged 15–24 or 29) against that of individuals of the prior generation (45 years of age and over).

National scores in the OECD Programme for International Student Assessment (PISA) are often used as a tool to compare national education performance (at www.oecd.org/pisa/pisaproducts/). This assessment aims to evaluate education systems worldwide every three years by assessing the skills of 15-year-olds'in the key subjects: reading, mathematics and science.

School leavers and dropouts

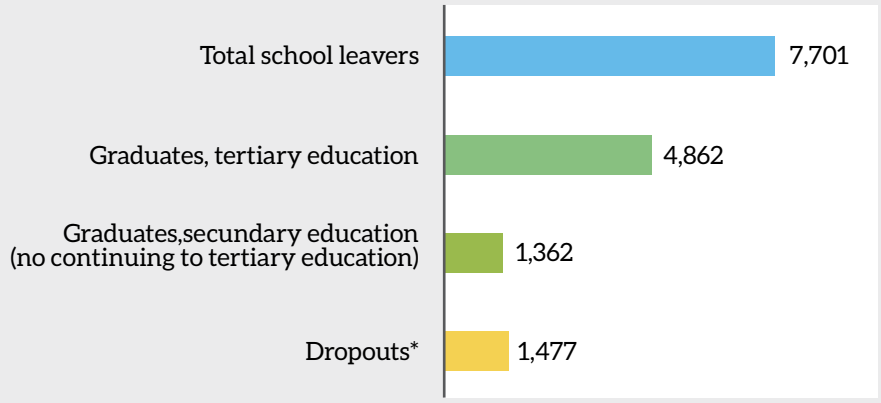
The flow from the education system to the labour market mainly takes the form of school leavers. School leavers are those young persons who have just left the education system (permanently or temporarily).

Not all school leavers enter the labour market. Some delay their entrance into the labour market with a period of economic inactivity for personal or family reasons (e.g. young women rearing their children, or young men and women deciding to spend some time abroad).

The dropout rate indicator shows the share of pupils from a cohort leaving school without completion, and its effect on the internal efficiency of educational systems. It is also one of the key indicators for analysing and projecting pupil flows from grade to grade within the educational cycle. For the analysis of youth employment, the number of school leavers gives information on the size and composition of potential new entrants in the labour market (see also Module 7).

Another education indicator, commonly used in developed countries, is that of early school leavers (or early leavers from education and training). These are defined as the proportion of youth aged 18–24 years old with, at most, lower secondary education and not involved in further education and training.

School leavers, academic year T1-T2 (thousands)

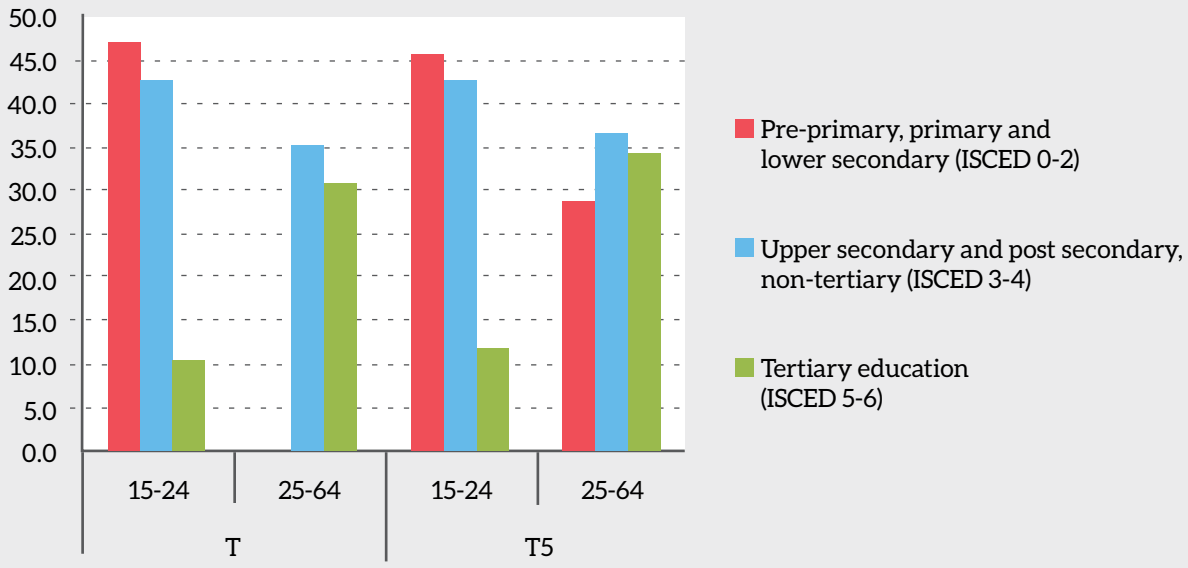


Note: (*) Dropouts from primary education (122), lower secondary (253), upper secondary (596) and tertiary (506).

Educational trends, dropout and labour market entry

The figure below summarizes the key education indicators of a country in the years T and T5 for youth (aged 15–24 years old) and adults (aged 25–64 years old). The table that follows provides the educational attainment of young men and women, compared with the average of the region.

Educational attainment, youth and adults (T and T5)



Youth educational attainment by sex, national and regional averages (T5)

	NATIONAL AVERAGE		REGIONAL AVERAGE	
	Men	Women	Men	Women
ISCED 0-2	49.1	42.4	47.5	42.7
ISCED 3-4	41.9	43.2	45.7	47.1
ISCED 5-6	9.0	14.4	6.8	10.2

School leavers, national level, thousand (T5)

Total school leavers	125.4
Graduates, secondary (not continuing)	33.2
Graduates, tertiary	65.6
Dropout, of which	26.6
• *From primary*	12.5
• *From lower secondary*	5.4
• *From upper secondary*	2.0
• *From tertiary*	6.7

What preliminary considerations can be made on the basis of the above figures?

Suggested answer

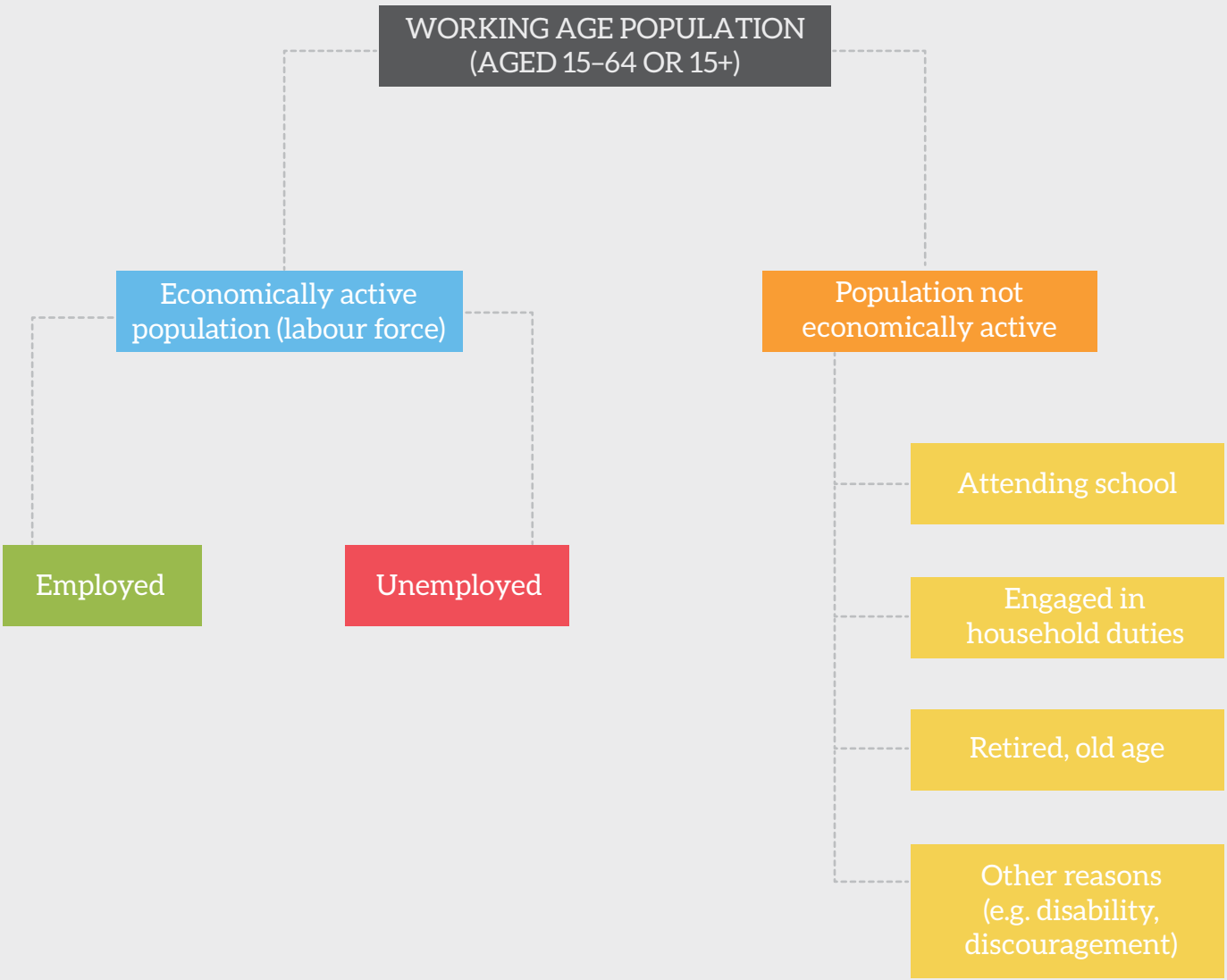
- The educational attainment of the population is increasing, as shown by the higher shares of the adult population with upper secondary and tertiary educational attainment in year T5 compared to T and the higher rates of youth with tertiary education.
- Overall, young women have a higher educational attainment compared to young men (larger share of women with upper secondary and tertiary educational attainment), a trend common in the region.
- As the majority of the young and adult population has at least upper secondary education, the country is likely to be a high-income country.
- Dropout is a concern especially at lower educational levels. The figures indicate that, if all low-educated dropouts were to enter the labour market, the economy would need to create approximately 18,000 jobs for low-skilled workers per year (the sum of primary and lower secondary school dropouts).

Youth labour force

The labour force (or the economically active population) refers to all persons of either sex who supply labour for the production of economic goods and services during a specified period. For youth, this refers to the population aged 15–24 years old (or 29) that is economically active, that is, either employed or seeking work.

The minimum age limit for measuring the labour force is not specified by international standards, but it is recommended that the data should at least distinguish between persons under and over 15 years of age. Similarly, the international standards do not refer to a maximum age limit for the measurement of the labour force. Usually, however, the labour force is measured for the population aged 15–64 years old (e.g. the population that is of working age). The proportion of the population not economically active is classified according to the reason for inactivity, as shown in Figure 2.3.

Figure 2.1.
Economically active and inactive population



Youth labour force participation rate

The labour force participation rate measures the extent of a country's working age population (aged 15–64 year old) that is economically active. It is defined as the ratio of the labour force over the working age population expressed in percentage terms.

$$LFPR = \frac{Active\ population}{Working\ age\ population} \times 100$$

This indicator plays a central role in the study of factors that determine the size and composition of a country's human resources and in making projections of the future supply of labour.

The breakdown of the labour force participation rate by sex and age group gives a profile of the distribution of the economically active population within a country.

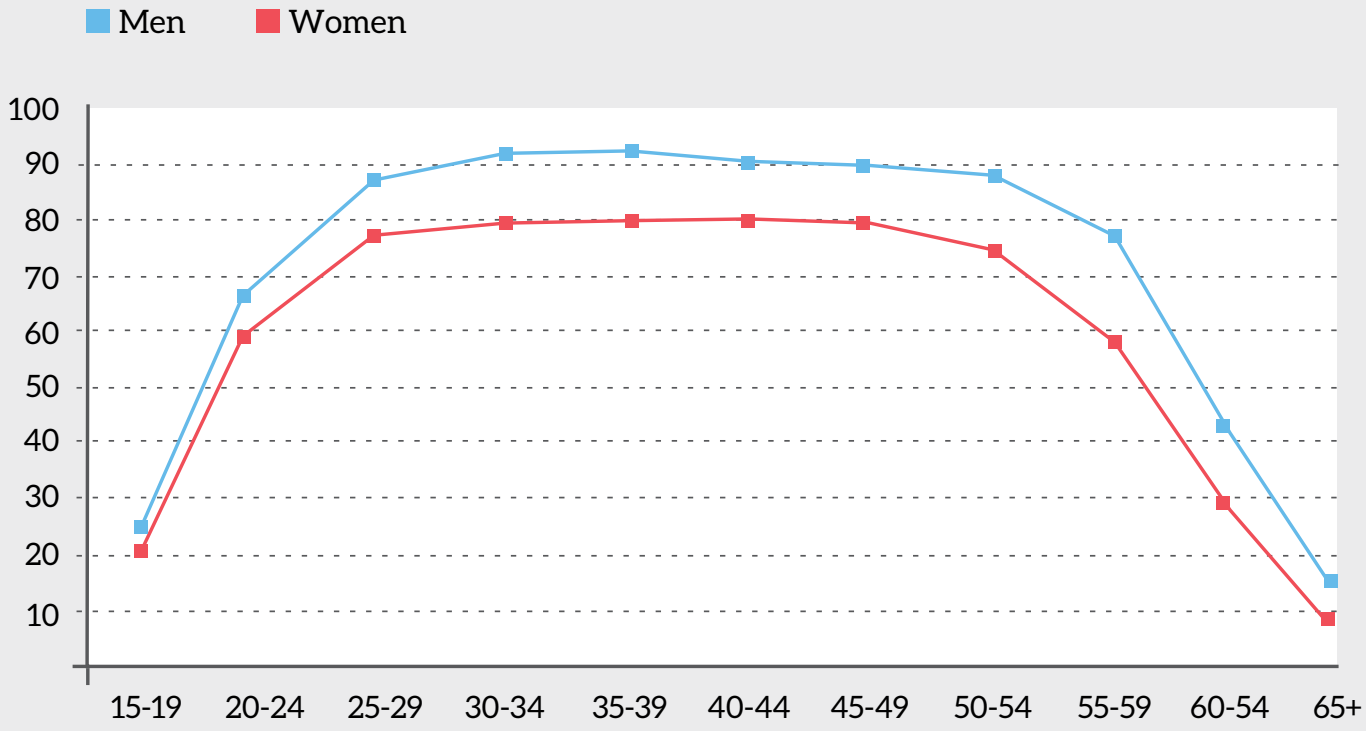
The example below shows that the labour force participation rate has an inverted-U shape, more pronounced for men than for women. The male curve is above the female curve, reflecting the higher labour force participation rate of men at all age groups. For each sex, the curve increases at low ages as young people leave school and enter the labour market, reaches a peak in the 35–39 age group years for men and 40–49 years for women, before decreasing as people retire from the labour market at older ages.

Typically, the labour market participation rates of youth people are influenced by school attendance. In some countries, young women are more likely than young men to be outside the labour force, since they are more likely to enroll in school or to be engaged in household and care duties.

The share of inactive teenagers, similarly, is often explained by the duration of compulsory education, with countries with longer periods of compulsory education more likely to have large shares of youth aged 15–19 years old out of the labour force. The adult labour market usually shows a lower participation of women (due to household and care duties) and older people (this depends upon the prevailing pension system in the country, life expectancy at birth and mortality rates). Participation by educational level may also be an avenue to explore: in some countries, the higher the education level, the higher the labour force participation (and also employment).

Labour force participation rates, engagement in education and care duties aside, may also be affected by a number of other factors. For example, if the taxation system applied to the second earners of a household is high, it is unlikely that second earners will enter the labour market.
An economic slump may also have an impact on labour force participation, although this may differ from country to country. During an economic downturn, certain countries may experience a decrease in youth labour force participation rates, as young people prefer to prolong their education rather than enter a slack labour market. Other countries experience the reverse, with young people abandoning school to enter the labour market, as they can no longer afford education and/or not to work.

Labour force participation rate

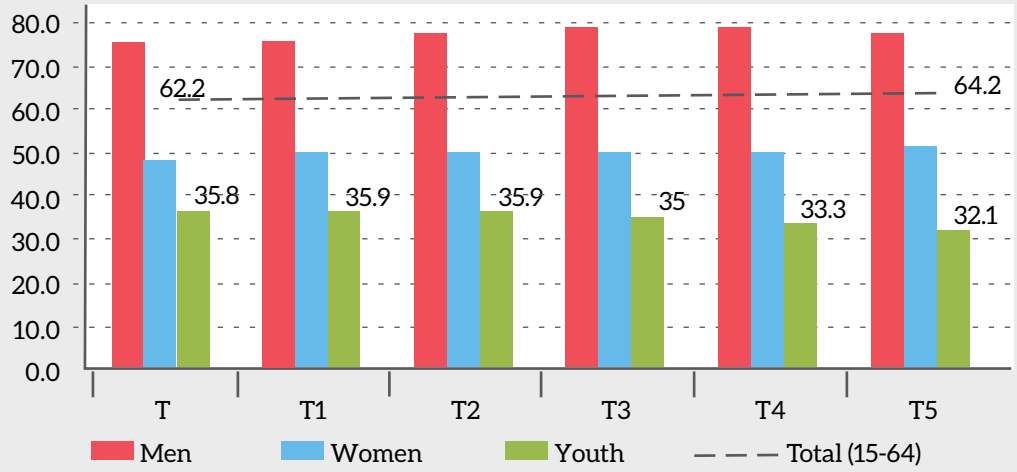


Labour force participation: rates and levels

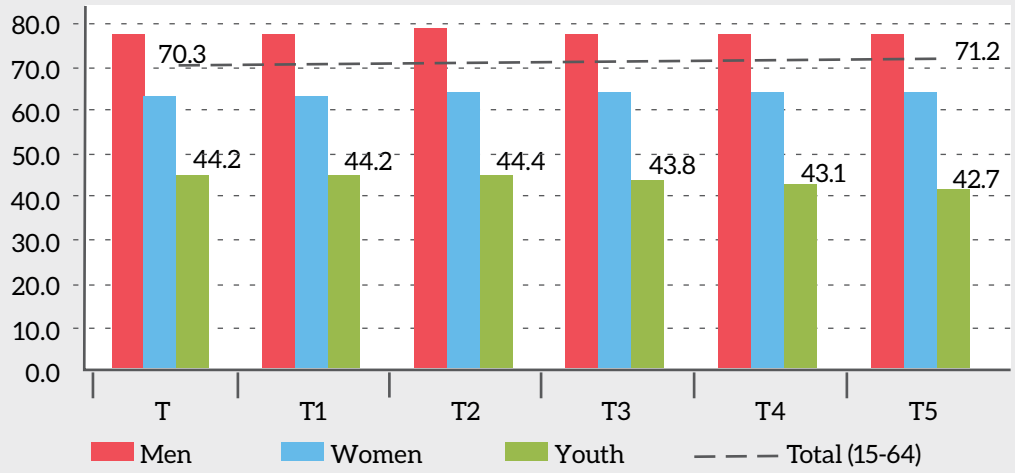
The figure below shows the labour force participation rates of Country A (youth and adults) and those of the region (year T and T5), while the table records the number of young individuals in the labour force in the last two consecutive years (year T5 and T6).

Labour force participation rates (T–T5)

Country A



Region



Youth in the labour force by sex, Country A, thousands (2011–12)

	T5		T6	
	Men	Women	Men	Women
Aged 15–19	13.9	6.4	16.2	7.4
Aged 20–24	50.7	30.2	59.9	33.6

What preliminary considerations can be made on the labour force participation trends of Country A? The overall number of young new entrants in the labour market in year T6 was 15,900 young persons (11,500 young men and 4,400 young women). How does this figure compare with the number of dropouts from the education system (see prior learning activity)?

Suggested answer

- During the period T-T5, the labour force participation rates of Country A were well below those recorded in the region. Low participation rates are mainly due to the low activity rates of women and of young people.
- The activity rate of young people (aged 15–24) is roughly half that of adults (32.1 per cent and 64.2 per cent, respectively in 2011). The participation of youth increased slightly in the biennium T2–T3 and then declined sharply (from 35.9 per cent in year T2 to 32.1 per cent in T5). This decline may be explained by increasing participation in education (this would need to be confirmed with school enrolment data for the same period).
- This declining trend, however, reversed in T6, as the overall number of youth in the labour force increased. The increase, however, is more pronounced for young men compared to young women.
- The total number of dropouts in year T6 was 26,600 young persons, while those who entered the labour market totaled 15,900. This means that approximately 40 per cent of those who left school were not economically active. As the increase in labour force participation is much slower for young women compared to young men, it may be that this is due to young women increasingly taking on household responsibility (this would need to be confirmed with figures on inactivity, by sex and by reason of inactivity). The labour force figures disaggregated by educational attainment would allow assessment of whether individuals with higher/lower levels of education are more/less likely to enter the labour market.

Glossary

Youth population
It is the share of individuals aged 15–24 (or 29) years old in the total population of a country.

Dependency ratio
The dependency ratio relates the number of children (aged 0–14 years old) and older persons (65 years or over) to the working-age population (aged 15–64 years old). Dependency ratios indicate the potential effects of changes in population age structures for social and economic development, pointing out broad trends in social support needs

Youth literacy rates
The percentage of youth aged 15–24 (or 29) years old who can read, write and make simple calculations (numeracy).

Educational attainment
The highest grade completed by individuals in the educational system of the country

Enrolment ratio
The number of individuals enrolled in a certain education level (pre-primary, primary, secondary and tertiary), divided by the population who is in the corresponding education enrolment age.

Dropout
Proportion of pupils from a cohort enrolled in a given grade at a given school year who are no longer enrolled in the following school year

Early school leaving
Share of individuals aged 18–24 years old who have at most lower secondary education

Labour force participation
Share of individuals in the working age population (aged 15+ or 15–64 years old) who are economically active (e.g. that are either employed or unemployed).

Additional reading

R. Hussmanns, F. Mehran and V. Verma: Surveys of economically active population, unemployment and underemployment. An ILO manual on concepts and methods (Geneva, ILO, 1990).

UNESCO Institute for Statistics: *International Standard Classification of Education 1997*, Re-edition (Montreal, UIS, 2006). Available at: www.uis.unesco.org

UNESCO Institute for Statistics: *Education indicators technical guidelines* (Montreal, UIS November 2009). Available at: www.uis.unesco.org/template/pdf/EducGeneral/Indicator_Technical_guidelines_EN.pdf

Module THREE

Labour supply: Youth employment, unemployment and inactivity

At the end of this module, readers will be able to:

- measure youth employment, unemployment and inactivity;
- assess the relative disadvantages that youth face in the national labour market; and
- measure the extent of labour slack at country level.

Learning exercises:

- Young workers and youth not in education, training or employment.
- Youth unemployment, expected duration of unemployment and labour slack.

Duration:

180 minutes.

Youth employment

The "employed" comprise all persons above the age specified for measuring the economically active population, who during the reference period were in the following categories:

Paid employment:

- ***At work:*** persons who, in the reference period, performed some work for wages or a salary, in cash or in kind; and
- ***With a job but not at work:*** persons who, having already worked in their current job, were temporarily not at work, but had a formal attachment to their job;[3]

Self-employment:

- ***At work:*** persons who, during the reference period, performed some work for profit or family gain, in cash or in kind; and
- ***With an enterprise, but not at work***: persons with an enterprise, who were temporarily not at work during the reference period.

Students, homemakers and others who combine their activities with paid employment/self-employment, and members of the armed forces are considered employed.

The international definition specifies that "some work" is to be interpreted as work for at least one hour during the reference period. The one-hour criterion serves to cover all types of employment that may exist in a country. "Work" is defined in a broad sense to cover all economic activities specified by the production boundary of the System of National Accounts. This in turn covers all production of goods whether intended for market sale or not, and production of services for the market, excluding those not intended for sale (such as cooking food for own consumption, sewing or mending clothes for own use, or teaching or nursing own children).

Total employment is an indicator of labour demand and accounts for the total number of persons who contributed to national production. When analysed in conjunction with data on the gross domestic product (GDP) and related variables, it sheds light on labour productivity and employment elasticity.

[3]Formal job attachment refers to: the continued receipt of salary during absence; an assurance of return to work following the end of a contingency, or an agreement as to the date of return; and the elapsed duration of absence from the job that may be that duration for which workers can receive compensation benefits without an obligation to accept other jobs.

Tips

Labour productivity is normally measured as Gross Domestic Product (at current price in US dollars) divided by total hours worked (or, if this is not available by total persons employed). For example, if the GDP of a country at current prices in USD million is 57,092 in year T and total hours worked are 1,562, labour productivity is

$$\frac{57{,}092}{1{,}562} = 36.6$$

Employment elasticity provides a numerical measure of how employment growth varies with growth in economic output. Employment elasticity is defined as the average percentage point change in employment for a given employed population group (total, female, male, agriculture, industry or services) associated with a 1 percentage point change in output (represented by total output or value added in a given sector) over a selected period, for example

$$E = \frac{\Delta L/L}{\Delta Y/Y}$$

Where L is the number of employed and Y overall output. $\Delta L/L$ is the percent change in employment and $\Delta Y/Y$ the percentage change in output.

For example, if in the period between T and T1 employment increased by 2.4 per cent and output by 5.3 per cent, elasticity is 2.4/5.3 or 0.45.

Employment-to-population ratio

Aggregate employment generally increases with a growing population. Therefore, the employment-to-population ratio is an important indicator of the ability of the economy to provide jobs to its growing population.

A decline in the employment-to-population ratio is an indicator of economic slowdown and a decline in total employment an indicator of a more severe economic slowdown.

The employment-to-population ratio, sometimes also referred to as employment rate, is defined in percentage terms as:

$$\text{Employment-to-population} = \frac{\text{Number of employees}}{\text{Working age population}} \times 100$$

Ratios should be calculated by sex, age group and educational attainment.

The employment-to-population ratio generally moves slightly faster than the labour force participation rate and slower than the unemployment rate. This ratio is often regarded as a lagging indicator of economic performance.

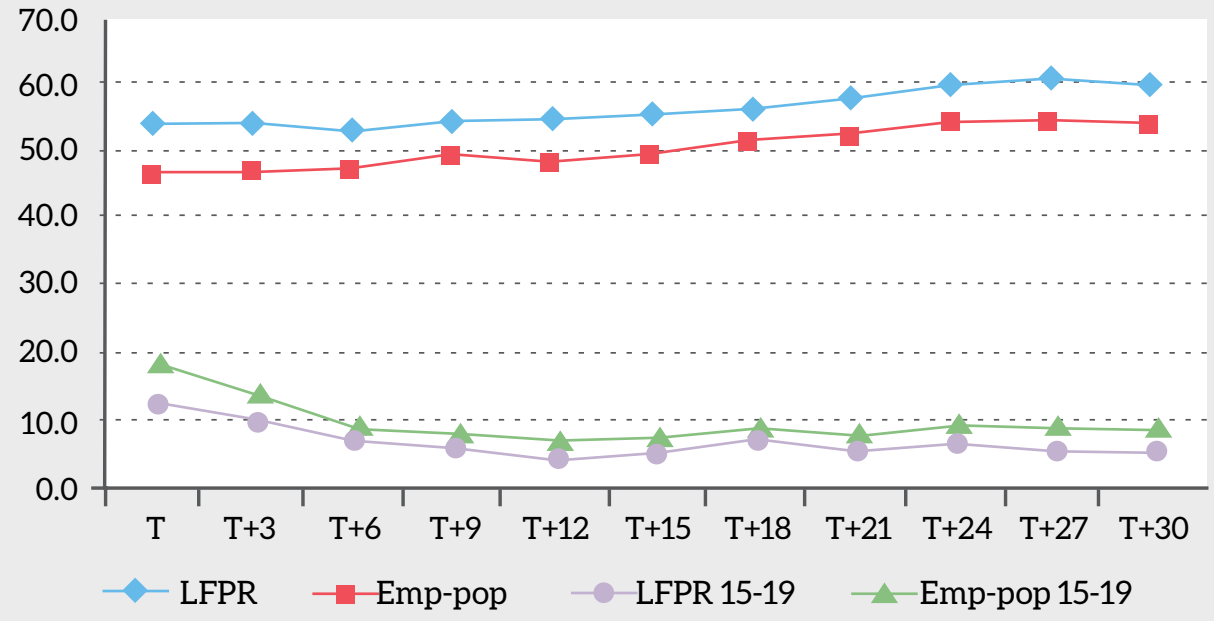
An example of historical data of the employment-to-population ratio for the working age population as a whole (15+ years old) and for teenagers (15–19 years old), during a 20-year span, is shown below and compared with the corresponding labour force participation rates.

The employment-to-population ratio of the working age population, while always near and below the labour force participation rate, shows a slightly more pronounced movement, closer to the underlying economic cycle than the labour force participation rate, which is flatter over the period. In the case of the teenagers, the employment-to-employment ratio (bottom half of the figure) follows almost exactly the labour force participation rate. An interesting feature of the youth employment-to-population ratio when drawn by single years of age is the possibility of calculating the age at which employment becomes the dominant activity of a typical young person.

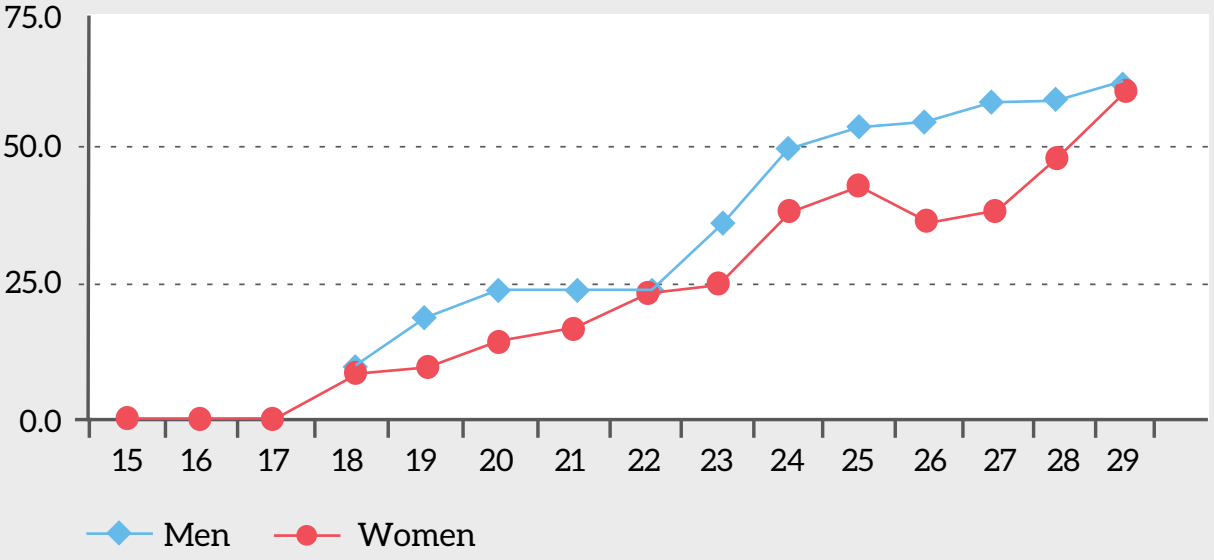
The figure below shows an example of the employment-to-population ratio plotted by single years of age (15–29 years) for men and women separately. The curves reflect the percentage of youth entering employment as they leave school or combine school and work. The curve for each sex increases steadily from a low of almost zero at the age of 15 to a maximum at the age of 29, of about 65 per cent for both men and women.

The point where the curve reaches 50 per cent corresponds to the age at which the majority of youth at that age are employed (e.g. 24 years old for young men and 28 years old for young women).

Labour force participation rate, employment-to-population ratio, teenagers (aged 15–19) and overall population (15+), (T–T30)



Employment-to-population ratio youth (aged 15–29 years) by single years



Young workers and youth not in education, training or employment

The table below provides the activity, inactivity and employment levels of young people (aged 15–24 years old) in Country B, by sex. Based on the figures, plot the shares of young people not in education, training or employment (NEETs,) and analyse the results against those of young workers.

Youth aged 15–24 by sex and activity status, Country B, thousands (year T)

YEAR T			
	Total	Men	Women
Population (aged 15–24)	1 326.1	671.3	654.9
Active	417.5	234.7	182.8
Employed	335.0	186.7	148.3
Inactive	908.7	436.6	472.1
In school	856.6	414.8	441.8

Young workers and NEET by sex, Country B (year T)

Suggested answer

- Young workers and NEET by sex, Country B (year T)
- The youth employment-to-population ratio in year T was 25.3 per cent (27.8 per cent for men and 22.6 per cent for women).
- The share of young unemployed over total population was 6.2 per cent (7.2 per cent for young men and 5.3 per cent for young women);
- The share of inactive youth and not in school was 3.9 per cent (3.2 per cent for men and 4.6 per cent for women); and
- The share of young NEETs was 10.2 per cent (10.4 per cent for young men and 9.9 per cent for young women).
- Although the share of young men and women who are not in education, training and employment are similar, for young men this share is mostly due to the portion of young men who are unemployed, while for young women it is mostly due to the larger share of those who are inactive.

Youth unemployment

According to the international standard definition of unemployment, the "unemployed" comprise all persons, above the age specified for measuring the economically active population, who during the reference period satisfied the following three conditions simultaneously:

- ***Without work***, i.e. not in paid employment or self-employment;
- ***Currently available for work,*** i.e. available for paid employment or self-employment during the reference period (or shortly after); and
- ***Seeking work***, i.e. had taken specific steps in a specified period (typically the last four weeks) to seek paid employment or self-employment. Persons without work who made arrangements to start work at a later date are classified as unemployed irrespective of their job-search activity, provided they were without work during the reference period and currently available for work.

The purpose of the *without work* criterion is to ensure that employment and unemployment are mutually exclusive, with precedence given to employment. A person is considered as without work if she or he did not work at all during the reference period (not even for one hour) or have a job or enterprise from which he or she was temporarily absent.

The *availability* criterion is meant to exclude from the count of the unemployed those persons who were not available for work during the reference period, although they might have been without work and seeking work for the future, such as students looking for a job after graduation, or other persons who cannot currently take up work due to family responsibilities, illness or other reasons.

The *seeking work* criterion means taking active steps to look for work (including registration with public or private employment agencies, direct application to employers, checking job advertisements, seeking assistance of friends or relatives, or searching for financial resources, machinery or equipment, permits or licenses to establish an enterprise).

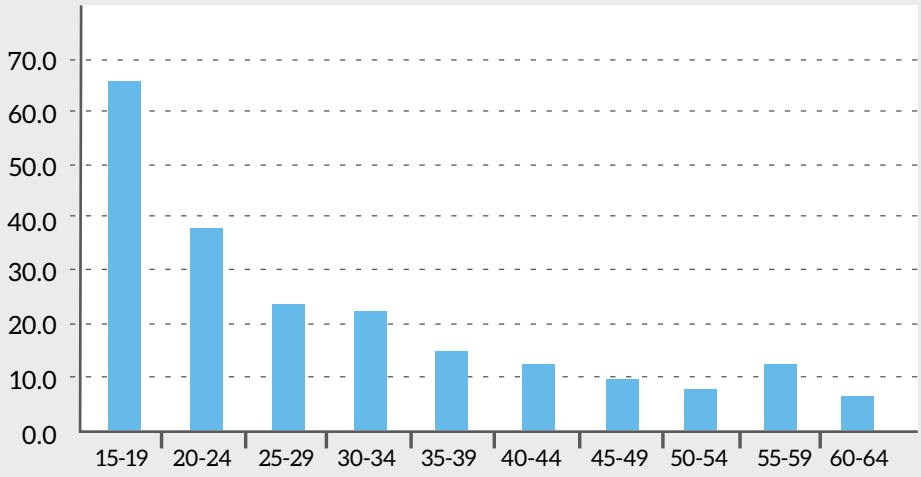
Unemployment rate

The unemployment rate is defined as the percentage of the economically active population (labour force) that is unemployed, for example

$$\textit{Unemployment rate} = \frac{\textit{Number of unemployed}}{\textit{Labour force}} \; x\,100$$

The unemployment rate represents the extent of unutilized labour supply in the country. It is also sometimes used in a general sense as an indicator of the health of the economy, not just the labour market. Unemployment rates for specific categories of individuals, such as men, women, youth, adults, geographic regions, or specific occupations and branches of economic activity, shed light on the groups of workers and sectors of the economy or regions most affected by unemployment. Unemployment generally affects youth more than adults. The result is that the unemployment rate of young people is almost invariably higher than that of the adults. The following example illustrates this phenomenon.

Unemployment rate by age group



A categorization of the extent of youth unemployment in a country is provided by the ratio of youth to adult unemployment rate, for example

Table 3.1 Ratio of youth-to-adult unemployment rate by world regions

Y/A UNEMPLOYMENT RATE RATIO	CATEGORIZATION	EXAMPLES
0 ≤ R <1	---	None
1 ≤ R <2	No abnormal youth unemployment	Sub-Saharan Africa
2 ≤ R <3	Serious youth unemployment	Developed economies, European Union, Central and Eastern Europe, East Asia, Latin America and the Caribbean
3 ≤ R	Extreme youth unemployment	South-East Asia and the Pacific, South Asia, Middle East, North Africa

Unemployment duration

Duration of unemployment is the length of time that an unemployed person has been without work, has been available for work, and has been actively seeking work. In practice, what is measured in a labour force survey is the duration of unemployment up to the time of the survey.

The expected duration of unemployment of the newly unemployed may be estimated under steady conditions by the relationship between stocks and flows of unemployed:

$$\textit{Expected duration of unemployment} = \frac{\textit{Stocks of unemployed}}{\textit{Flows of unemployed}}$$

The following example shows how to calculate unemployment duration for youth.[4]

[4] More elaborate estimates of the expected duration of unemployment may be derived by matching individuals in common rotation groups in labour force surveys with rotation sampling designs or by constructing synthetic cohorts in repeated cross-sectional surveys.

Expected duration of unemployment for teenagers (15-19 years old)

WEEKS OF UNEMPLOYMENT	THOUSANDS OF PERSONS (AGED 15–19 YEARS OLD) UNEMPLOYED	EXPECTED DURATION OF UNEMPLOYMENT OF NEWLY UNEMPLOYED TEENAGERS
Total	71 700	
Less than 1 month	8 700	= 71 700/8 700
1–2 months	29 300	= 8.2 (3 weeks units)
3–5 months	15 000	= 8.2 x 3
6–11 months	11 300	= 24.6 weeks (or 6.1 months)
12–17 months	5 500	
Over 17 months	1 900	

The expected duration of unemployment among youth is highly correlated to the level of education attainment. Research has shown that the expected length of unemployment of graduates from secondary education is much higher than that of university graduates.

Tips

The key indicators of the youth labour market (labour force participation, employment, unemployment and inactivity) need to be disaggregated by educational attainment whenever possible. Educational attainment, in fact, is among the most important factors determining labour market outcomes for youth in many counties.

Statistical probability techniques (probit or logit models) are normally used to understand the influence that each individual characteristic (sex, age, education, work experience, marital status) has on the probability of experiencing a certain labour market outcome (employment, unemployment or inactivity).

This however, can also be done intuitively by comparing the labour force survey figures of the youth population presenting the labour market outcome of interest (e.g. unemployment) with those of young people in the opposite situation (employed) by age cohort, sex, level of education, rural/urban divide, marital and parental status, medical condition, prior work experience, national origin and any other personal characteristics available.

Underemployment

Underemployment reflects underutilization of the productive capacity of the employed population. It relates to an alternative employment situation in which persons are willing and available to engage. The international standards on this topic are limited to the measurement of time-related underemployment. According to these standards, time-related underemployment exists when the hours of work of an employed person are insufficient in relation to an alternative employment situation in which the person is willing and available to engage.

Persons in time-related underemployment comprise all persons in employment, as defined earlier, who satisfy the following criteria:

1- Willing to work additional hours in the present job, in an additional job, or in a new job replacing the current one;

2- Available to work additional hours (i.e. ready to work additional hours, given opportunities for additional work); and

3- Works less than a specified number of hours, i.e. hours actually worked in all jobs during the reference period are below a threshold defined according to national circumstances.

Two particular categories of individuals in time-related underemployment are persons who usually work part-time schedules and want to work additional hours (involuntary part-time), and persons who during the reference period worked less than their normal hours of work.

Discouraged workers

There is no international standard definition of discouraged workers, but an increasing number of countries measure this category of workers as part of their labour force surveys. The definitions used are, however, very diverse and sometimes not even explicitly formulated.

For measurement purposes, it is convenient to define discouraged workers as persons not economically active (i.e. not classified as employed or unemployed according to the labour force framework), currently available for work and seeking work during the past six months, but not actively looking for work during the reference period because of their discouragement from past failure in finding work.

Among individuals not in the labour force, there are other groups of persons who are involuntary inactive and have a certain degree of attachment to the labour market (e.g. persons willing and available for work, but not seeking work for reasons such as illness or disability).

Labour underutilization: Labour slack

Labour underutilization comprises three components: (i) labour slack (e.g. mismatch in the volume of labour supply and labour demand); (ii) low earnings (low remuneration for work, see Module 6); and iii) skills mismatch (mismatch between education and occupation, see Module 4).

Labour slack reflects the lack of a sufficient volume of work. It comprises unemployment, time-related underemployment, discouragement and other forms of attachment to the labour force (e.g. inactive individual, but willing and available for work).

The following example presents estimates of youth labour slack and its components calculated on the basis of national labour force surveys of two fictional countries.

How to measure youth labour slack

To calculate youth labour slack it is necessary to obtain the following figures:

- Youth population
- Youth labour force
- Unemployed youth
- Youth in time-related underemployment
- Number of discouraged workers
- Inactive youth willing and available for work

The above youth (aged 15–24 years old) labour market figures for Country A and Country B are reported below along with calculations of the relative labour slack.

	Country A (thousands)	%	Country B (thousands)	%
Population	2 243	100	1 398	100
Unemployed	643.1	28.7	90.9	6.5
Underemployment	89.7	4.0	229.3	16.4
Discouraged workers	206.6	9.2	13.9	1.0
Inactive, willing to work	248.3	11.1	18.1	1.3
Labour slack	1 187.7	52.9	352.2	25.2

The figures show that, when analysing the youth labour market, one should not limit the analysis to the unemployment rate alone. In addition to the unemployed, large numbers of young persons may be underemployed, working less than full-time and looking for additional work, or are discouraged workers.

Youth unemployment, expected unemployment duration and labour slack

Based on the figures provided in the tables below, calculate: the youth unemployment rate, the youth-to adult unemployment rate ratio, and the expected duration of unemployment for youth and overall labour slack in Country C. What are the main conclusions that can be drawn from the figures?

Key labour market indicators, Country C, thousands (Year T)

	15–24	25–64
Population	2 022.8	8 969.3
Labour force participation	1 414.8	7 299.2
Unemployed	134.1	325.9
Employed	1 280.8	6 973.3
Involuntary part-time	90.4	2 770.0
Inactive	608.0	1 670.1
In school	503.4	70.1
Discouraged workers	10.9	90.2
Inactive, but willing to work	24.0	272.9

Young unemployed by duration, Country C, thousands (Year T)

UNEMPLOYMENT DURATION	15–24
Total	134.1
Less than 1 month	15.4
1–2 months	48.0
3–5 months	26.6
6–11 months	20.2
12 months and over	15.8

Suggested answer

- The youth unemployment rate is 9.5 per cent (134.1*100/1,414.8), while for adults it is 4.5 per cent (325.9*100/7,299.2). Therefore, the youth-to-adult unemployment rate ratio is 2.1 (9.5/4.5).
- The expected duration of youth unemployment is 8.7 months (134.1/15.4).
- Discouraged workers represent 0.5 per cent of the youth population, while the inactive, but willing to work comprise 1.2 per cent of the total youth population.
- Involuntary part-time workers represent 4.5 per cent of the total youth population (90.4*100/2,022.8).
- Young people are twice more likely to be unemployed compared to adults. However, adults are more likely than youth to be working involuntary part-time workers, to be discouraged workers or to be inactive but willing to work.
- Youth labour slack is summarized in the table below:

YOUTH LABOUR SLACK, YEAR T	PERCENTAGE
Youth unemployment	9.5
Involuntary part-time	4.5
Discouraged workers	0.5
Inactive, but willing to work	1.2
Total	15.7

Youth inactivity

The inactivity rate is the percentage of the population that is neither working nor seeking work. The inactivity rate of the 15–24 age group, when added to the youth labour force participation rate, should be equal to 100 per cent.

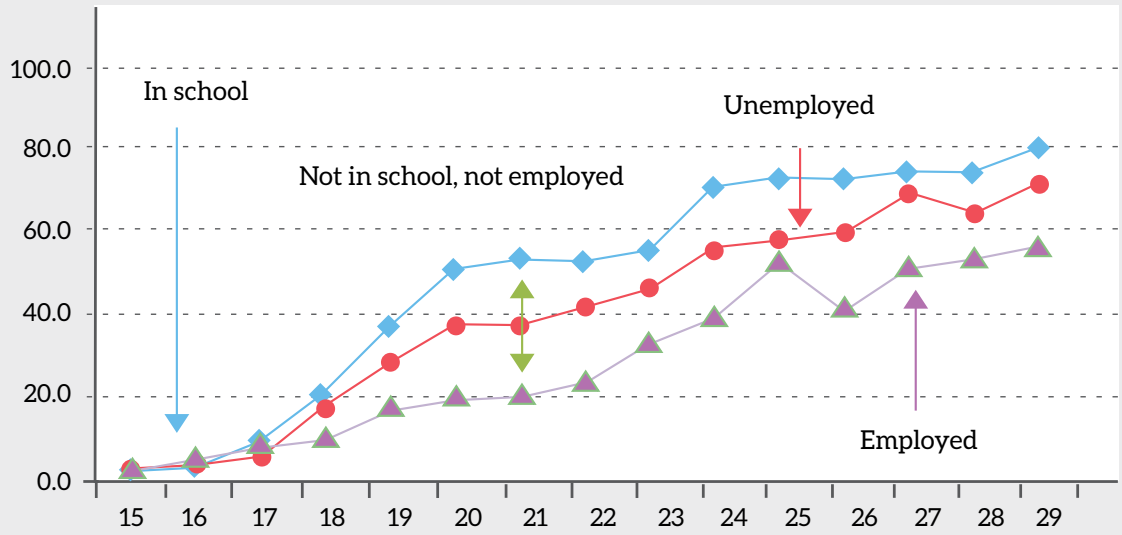
The inactivity rate provides information on the potential labour force. The inactivity rate of young women, in particular, also gives information on the social customs of the country, attitudes towards women in the labour force, and family structures in general.

Youth not in school or in employment

An increasingly examined indicator on youth inactivity focuses on youth not in education and not in employment. The indicator captures two groups: (i) youth who are economically inactive for reasons other than participation in education, and (ii) unemployed youth. Compared to the youth inactivity rate, this is a better indicator for the proportion of youth that remains “idle”, and a better measurement of youth denied access to employment opportunities.

The following figure provides an example of this indicator. The graph plots the percentage of youth not in school against the percentage of young workers by single years of age. From around the age of 17 onwards, the graph show a gap between school and employment.

Youth not in school or employment by single years



The gap reflects young people who are neither in school or employed. Some of these young people are looking for work (e.g. the unemployed), and some are inactive. The figure shows that after the age of 17 the gap increases until the age of 20, then remains more or less constant, indicating that there is a significant group of young people who do not transit from school to work upon leaving the education system.

Glossary

Employment to population ratio
The employment to population ratio is the share of the population above a specified age who, for a specified period (either one week or one day), performed some form of work for a wage or salary (paid employment), for profit or family gain (self-employment), either in cash or in kind.

Unemployment rate
The unemployment rate is the percentage of individuals who are without work, available to work and searching for a job over the labour force.

Inactivity rate
The inactivity rate refers to the share of the population who are not economically active (e.g. are not employed or unemployed). The sum of the inactivity rate and the labour force participation rate should give 100%.

Labour productivity
Labour productivity is defined as output (gross domestic product) per unit of labour input (persons employed).

Labour elasticity
Labour elasticity is the percentage change in employment create by a 1 percentage change in gross domestic product.

NEETs
NEETs are individuals who are not in employment, education or training (e.g. the sum of all unemployed plus the inactive not in school). It is an indicator used to measure youth's disengagement from the labour market

Labour slack
Labour slack is labour underutilization represented by the unemployed, the share of underemployed, involuntary part-timers and discouraged workers.

Time-related underemployment
Time-related underemployment exists when the hours of work of an employed person are insufficient in relation to an alternative employment situation in which the person is willing and available to engage.

Discouraged workers
Discouraged workers are inactive persons who, while willing and able to engage in a job, are not seeking work or have ceased to seek work because they

Additional reading

Additional reading African Development Bank: *Labour force data analysis: Guidelines with African specificities* (Tunis, AfDB, 2012). Available at: www.africaneconomicoutlook.org/fileadmin/uploads/aeo/PDF/Labour%20Force%20Data%20Analysis_WEB.pdf

Eurofound: NEETs – young people not in employment, education or training: Characteristics, costs and policy responses in Europe (Luxembourg, Publications Office of the European Union, 2012).
R. Hussmanns, F. Mehran and V. Verma: Surveys of economically active population, unemployment and underemployment. An ILO manual on concepts and methods (Geneva, ILO, 1990).

ILO: *Beyond unemployment: Measurement of other forms of labour underutilization* (Geneva, ILO, 2008). Available at: www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_100652.pdf

ILO: *Resolution concerning the measurement of underemployment and inadequate employment situations* adopted by the Sixteenth International Conference of Labour Statisticians, Geneva, October 1998.

OECD: "Supplementary measures of labour market slack an analysis of discouraged and involuntary part-time workers", in Employment Outlook 1995 (Paris, OECD, 1995). Available at: www.oecd.org/els/emp/2409859.pdf

Module FOUR

Labour demand: Status in employment, employment by branch of economic activity and occupations

At the end of this module, readers will be able to:

- classify young workers by status in employment and measure vulnerable employment;
- analyse the shifts of youth employment across branches of economic activity;
- identify the top occupations held by young men and women workers and calculate the occupational segregation index; and
- measure education mismatches.

Learning exercises:

Vulnerable employment.
Education mismatch and segregation index.

Duration:

180 minutes.

Introduction

In simplified static models of the labour market, total labour demand and labour supply are observable only as total actual employment. To a large extent, therefore, measurement of employment, as described earlier, is also relevant for the measurement of a significant proportion of labour demand. Accordingly, the structure of employment in terms of branch of economic activity, occupation and status in employment reflects the type of labour demanded by the economy.

Labour force surveys generally measure employment in terms of persons. Conversely, an analysis of labour demand should, in principle, measure employment in terms of jobs. A person may hold more than one job, while other jobs may be vacant. Hence, the distribution of employment by branch of economic activity, occupation and status in employment may not fully reflect the distribution of jobs in an economy.

Status in employment

Status in employment classifies the jobs held by individuals at a given point of time with respect to the type of employment contract (explicit or implicit) the individual has.

The International Standard Classification of Status in Employment (ICSE-1993) identifies five categories of persons with respect to their status in employment:

- **Employees:** persons working in "paid employment jobs", i.e. holding an explicit (written or oral) or implicit employment contract with remuneration not directly dependent upon the revenue of the unit for which they work. Remuneration can be in the form of wages or salaries, commission from sales, piece rates, bonuses or in-kind payments such as food, housing or training;

- **Employers:** persons working on own-account or with one or a few partners in "self-employment jobs", i.e. (i) remuneration is directly dependent on the profits (or potential for profits) derived from the goods and services produced or for own consumption, and (ii) engaging one or more "employees," on a continuous basis;

- **Own account workers**: persons working on own account or with one or a few partners in a "self-employment job", not engaging any "employees", on a continuous basis;

- **Contributing family workers:** persons working in a market-oriented establishment operated by a household member, who cannot be regarded as partner, in a "self employment job", not engaging any "employee" on a continuous basis; and

- **Members of producers' cooperatives:** persons working in a cooperative producing goods and services, in a "self employment job", not engaging any "employee" on a continuous basis.

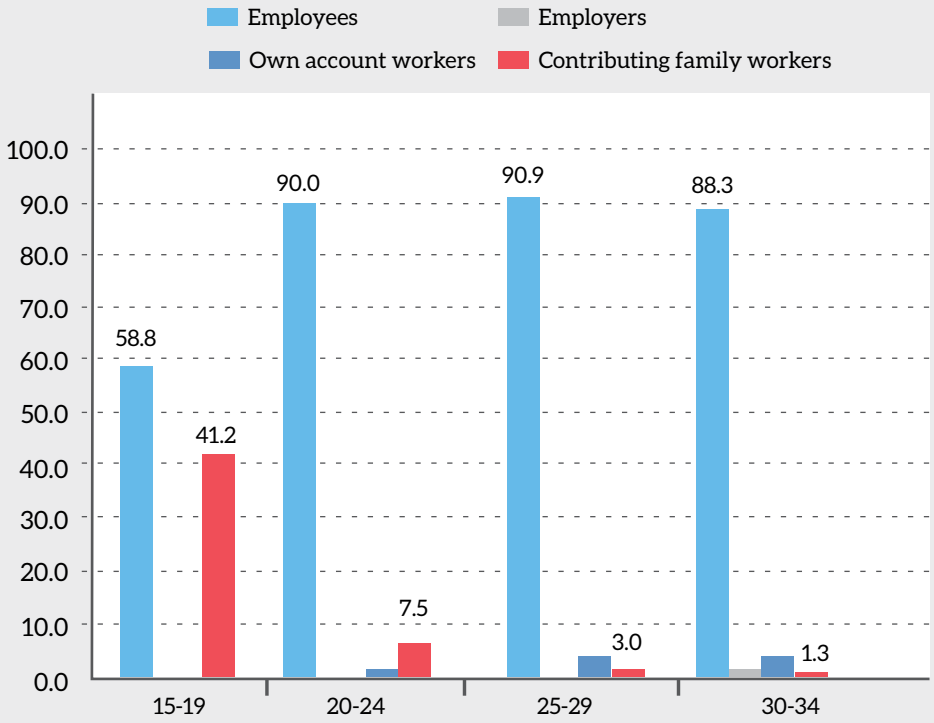
Breaking down employment information by status in employment provides a statistical basis for describing workers' behaviour and conditions of work.

A high proportion of wage and salaried workers in a country can signify advanced economic development. If the proportion of own account workers (self-employed without hired employees) is sizeable, it may be an indication of a large agriculture sector and low growth in the formal economy.

In many countries, youth at early ages work as contributing family workers, often combining school and work at the family farm or at the household enterprise. At later ages, the relative number of contributing family workers decreases and the number of employees increases as young people leave the education system and enter the labour market for the first time.
Relatively fewer young people are self-employed at any age. To be an employer or own-account worker generally requires capital investment and a certain amount of self-employment skill. Lack of information coupled with low awareness about self-employment opportunities lead many young people to consider wage employment the only pathway to the labour market.

Figure 4.1 illustrates this pattern: the share of contributing family workers declines with increasing age, while that of employees increases up till around 29 years of age. Young men (aged 15–24 years old) are twice more likely to be contributing family workers compared to their female peers.

Workers (aged 15–24 years old) by status in employment, Year T



Vulnerable employment

Vulnerable employment is measured as the proportion of own account workers and contributing family members over total employment e.g.:

$$Vulnerable\ employement\ = \frac{Own\ account + Family\ members}{Total\ employement}$$

The categories of own account workers and contributing family workers are thought to be particularly vulnerable when it comes to both economic risk and strength of institutional arrangements. Given that institutional arrangements for the work of own account workers and contributing family members are likely to be weak, such workers are: (i) more likely to lack contractual arrangements that can lead to job insecurity and (ii) unlikely to benefit from social security, health or unemployment coverage.

If the proportion of vulnerable workers is sizeable, it may be an indication of a large agriculture sector, lack of growth in the formal economy or widespread poverty.

Vulnerable employment

The National Bureau of Statistics has recently disseminated youth employment figures by status in employment (see table below).

Youth (aged 15–24) employed by status in employment, Year T (thousands)

STATUS IN EMPLOYMENT	TOTAL	MEN	WOMEN
Employees	31.6	18.5	13.1
Employers	0.7	0.6	0.1
Own account workers	2.4	2.1	0.3
Contributing family workers	12.3	7.2	5.1
Total	47.0	28.4	18.6

What preliminary conclusions can be drawn from the figures? What is the share of vulnerable employment? What other figures are required to better analyse the situation of young workers?

Suggested answer

- Over a third of young workers (31.2 per cent) are in vulnerable employment, with young men more likely than young women to be in vulnerable employment (32.7 per cent of all young male workers are in vulnerable employment compared to 29 per cent of young female workers).
- The fact that the share of contributing family workers is sizable may point to a large agricultural sector (to be confirmed by data on employment by branch of economic activity). The data also suggest that women are much less likely to enter self-employment compared to men, which may point to discrimination in the labour market. This, however, need to be confirmed by figures on occupation.
- Employment by branch of economic activity and by occupation would be needed to better understand the sex distribution of employment. Also, status in employment figures disaggregated by level of educational attainment may show whether low educated individuals are more likely to be in vulnerable employment than other groups.

Employment by branch of economic activity

Branch of economic activity" refers to the activity of the establishment in which an employed person works. An establishment can be a farm, a factory, a workshop, a store, an office or a similar type of economic unit. An "establishment" is an autonomous part of an enterprise that carries out a single type of economic activity at a single physical location.

Because the classification of economic activities is based on the homogeneity of activities carried out by the economic unit, it is important to distinguish enterprises from establishments. An "enterprise" is a legal entity (or group of legal entities) and may comprise a number of establishments with different economic activities operating from different locations.
Branch of economic activity describes what the establishment does, not the job done by the individual; for example, a person may work as a security guard in a department store, as an accountant in a hotel, or a bus driver who drives passengers to aircraft at an airport.

For those who are self-employed, without employees on a continuous basis, the activities of establishments they represent will be those that they undertake themselves. For multi-establishment enterprises, the predominant activity of the establishment (the location where the person works) is recorded, rather than the predominant activity of the enterprise (legal entity). For unemployed persons with prior work experience, the branch of economic activity refers to the activity of the establishment where they last worked.

Most countries use the International Standard Industrial Classification (ISIC Rev 3.1 or the more recent Rev 4) to classify economic activities (see Table 4.1).

Youth employment data by branch of economic activity are useful for the analysis of shifts in employment over the course of economic development (e.g. from agriculture to industry to services).

Detailed data on the structure of youth employment by branch of economic activity show the industries in which the demand for youth labour is concentrated. Data over time allows the identification of economic sectors where employment is growing or stagnating, and where job potential for youth employment is greater.

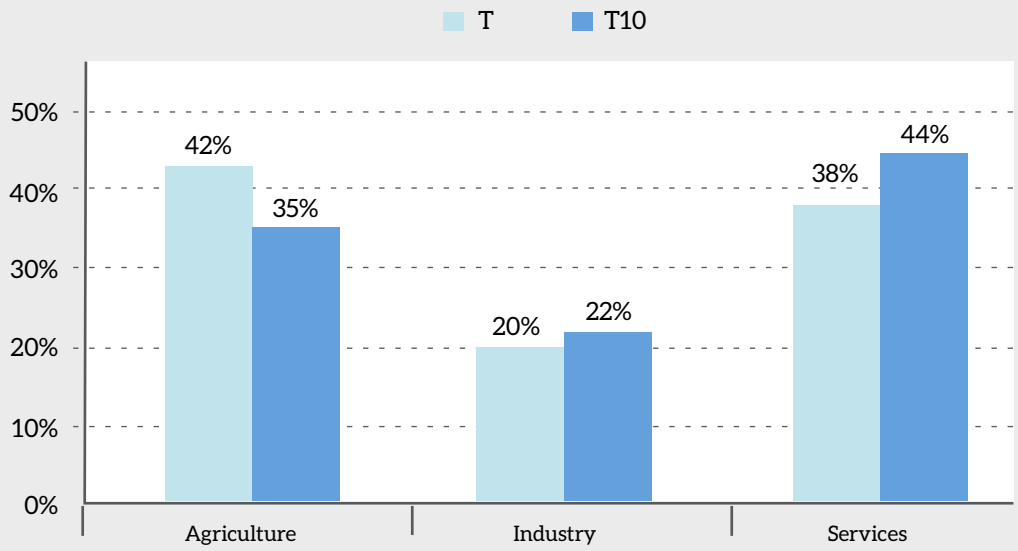
Matching employment data by branch of economic activity and corresponding data on job vacancies can provide information on where demand for labour is occurring and can serve as a guide for policy-makers to design skills and training programmes to improve the match between supply and demand for youth labour (see Module 5).

The following figure illustrates the shift in distribution of youth employment over a decade.

Table 4.1 International Standard Industrial Classification (Rev 3.1 and Rev 4)

	ISIC Rev 3.1	ISIC Rev 4
Agriculture	A. Agriculture, hunting and forestry B. Fishing	A. Agriculture, forestry and fishing
Industry	C. Mining and quarrying D. Manufacturing E. Electricity, gas and water supply F. Construction	B. Mining and quarrying C. Manufacturing D. Electricity, gas, steam and air conditioning supply E. Water supply; sewerage, waste management and remediation activities F. Construction
Services	G. Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods H. Hotels and restaurants I. Transport, storage and communications J. Financial intermediation K. Real estate, renting and business activities L. Public administration and defense; compulsory social security M. Education N. Health and social work O. Other community, social and personal service activities P. Activities of private households as employers and undifferentiated production activities of private households Q. Extraterritorial organizations and bodies	G. Wholesale and retail trade; repair of motor vehicles and motorcycles H. Transportation and storage I. Accommodation and food service activities J. Information and communication K. Financial and insurance activities L. Real estate activities M. Professional, scientific and technical activities N. Administrative and support service activities O. Public administration and defense; compulsory social security P. Education Q. Human health and social work activities R. Arts, entertainment and recreation S. Other service activities T. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use U. Activities of extraterritorial organizations and bodies

Sectoral shift in youth employment (T–T10)



Over a decade the share of youth employment in agriculture decreased by 7 per cent; correspondingly, employment in services increased by about the same amount (6 per cent). National results are usually benchmarked against sectoral shifts experienced by neighbouring countries (or group of countries) or by countries in the same income bracket.

Youth occupations

"Occupation" refers to the kind of work undertaken by a young employed person (or the kind of work undertaken previously or wanted, if the young person is unemployed), irrespective of his/her branch of economic activity or status in employment. The study of the occupations carried out by young people – and especially the relationship between occupations and skill levels and between occupations and the level and field of education – helps in the design of career development and labour market policies for youth.

The new International Classification of Occupations (ISCO-08) classifies occupations by four levels of aggregation and uses the International Standard Classification of Education to define four levels of skill:

- ***1st level*** – primary education or first stage of basic education;
- ***2nd level*** – lower secondary or second stage of basic education;
- ***3rd level*** – upper secondary education; and
- ***4th level*** – higher education.

The skill levels reflect the range and complexity of the tasks and duties associated with each job.

Skills mismatches

The term "skills mismatch" covers several different concepts. Of these, ***education mismatch*** is the most researched and refers to a situation in which the educational qualifications held by a worker differ from those perceived as necessary by either the employer or the worker to carry out the tasks associated with his or her job. Typically, measures of education mismatch are limited to ***over-education*** and ***under-education***, that is, an individual has more or less education than the current job requires (measured in years of education). This is also referred to as ***vertical mismatch***. Conversely, ***horizontal mismatch***, conversely, refers to a situation in which the level of education matches the job requirements, but the type of education is inappropriate for the current job. This type of mismatch can be measured with detailed data on the type of education held by workers, if the labour force survey collects this type of data. Otherwise, it is necessary to collect primary data.

In contrast to education mismatch, ***skill mismatch*** is a more direct concept based on whether workers have the actual skills needed to carry out successfully required job tasks. Typically, skill mismatch comprises ***under-skilling***, where an individual lacks the skills necessary to perform the current job to acceptable standards), and ***over-skilling***, where an individual is not able to use fully his or her skills in the current job). A third category, ***required skills***, is used for situations where the individual has the right skills to perform his or her current job and fully utilizes them. Data to measure under-skilling are generally collected through establishment surveys (e.g. by asking employers whether the workforce has the skills required to perform the job), while over-skilling can be measured by establishment surveys where these include a questionnaire to be administered to employees of the establishment surveyed.

A ***skills gap*** generally refers to a situation where the level of skills of the person is lower than that required to perform the job, or the type of skills does not match the job requirements (i.e. it comprises both education mismatch and skills mismatch).

A ***skill shortage*** refers to a situation where employers in specific sectors cannot find suitably qualified workers. In consequence, the job is often left vacant. Although there is no match or mismatch between a worker and a job, it may eventually lead to a situation where under-skilled workers occupy vacant posts. Data to measure skills shortages are usually provided by occupational skills surveys. The reverse situation, where the supply of individuals with a particular set of skills exceeds the demand of employers, is known as a ***skills surplus.***

Education mismatch

A simple method to measure education mismatch (namely over-education) is to use the level of educational attainment and one-digit occupational classification applied to the main job. The following example provides a schematic illustration with the shaded areas representing mismatch.

Education mismatch may also be measured through establishment surveys, where employers are asked whether the education of the workforce is a constraint to business operations. An example of such measurement is provided by the enterprise surveys carried out by the World Bank (see www.enterprisesurveys.org/Data).

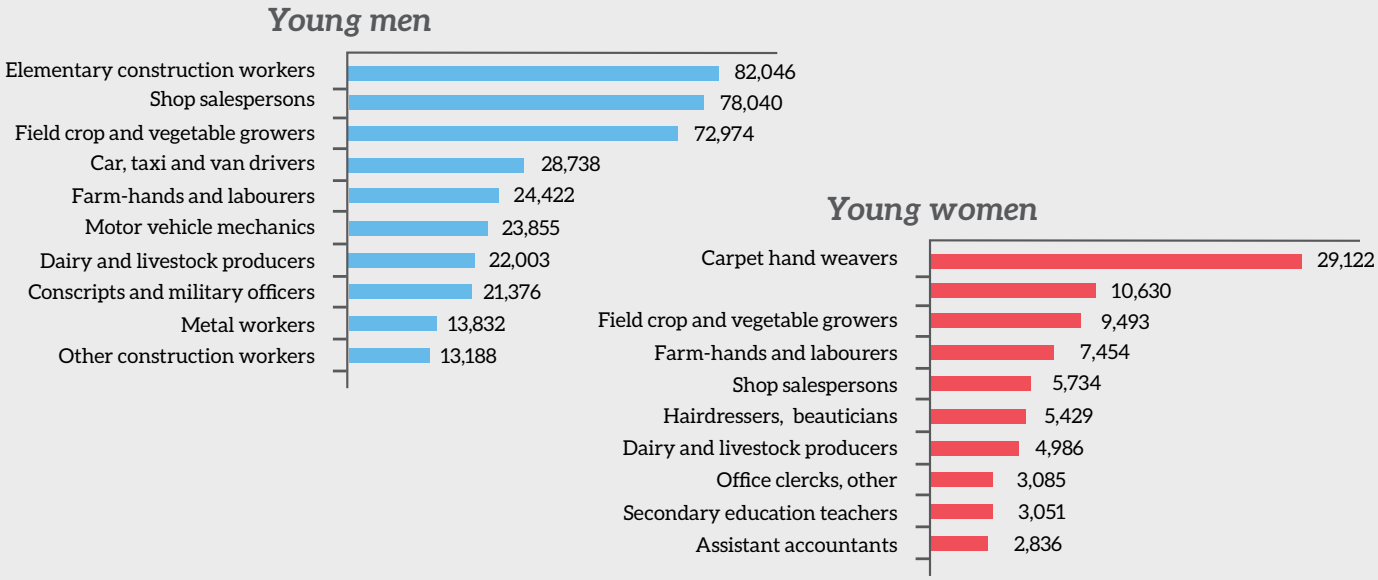
The detailed analysis of youth occupations provides information on occupations with the highest concentration of youth in relation to adults. This information is obtained by calculating the percentage of youth in each occupation and ranking the occupations by this percentage.

Education and occupation mismatch as a function of ISCO and ISCED

ISCO-08 MAJOR GROUPS		ISCED-97 EDUCATIONAL ATTAINMENT						
		0	1	2	3	4	5	6
		ISCO-08 SKILL LEVEL						
		1st		2nd		3rd		4th
1	Managers							
2	Professionals							
3	Technicians and associate professionals							
4	Clerical support workers					Mismatch		
5	Service and sales workers							
6	Skilled agricultural, forestry, fishery workers							
7	Craft and related trades workers							
8	Plant and machine operators and assemblers							
9	Elementary occupations							

Another type of analysis identifies occupations in which most youth people are engaged. This information is obtained by ranking the occupations by frequency in terms of number of youth employed, as shown in the example below.

Top 10 occupations, young people (aged 15–24), Country B, Year T



Occupational segregation

According to the example, only four of the top ten occupations (salespersons, field crop growers, farmhands and dairy production) are common to both young men and young women. This suggests some degree of segregation between male and female occupations.

A more accurate measurement may be obtained by calculating the segregation index and comparing the result with other countries. The common formula of the segregation index, often also referred to as the index of dissimilarity, is given by:

$$D=1/2 \ x \sum i \ nAi/nA- nBi/nB$$

Where:

nAi is the number of young men in occupation i
nBi is the number of young women in occupation i
nA is the number of young men in all occupations, and *nB* is the number of young women in all occupations The value of the segregation index ranges from 0 (no segregation) to 1 (complete segregation).

The occupational sex segregation index is one of the ILO's decent work indicators. It is a commonly used as a proxy indicator for equality of opportunity in employment and occupation.

The index measures the extent to which labour markets are separated into "male" and "female" occupations, that is, the percentage of female (or male) non-agricultural employment in a female-dominated (or male-dominated) occupation. The indicator reflects direct and indirect discrimination in access to employment opportunities (i.e. in education and training) at entry and within the labour market (i.e. recruitment, on-the-job training opportunities, promotion, job change during upgrading).

Crowding of women in occupations with low wages explains a large part of the differences in earnings between men and women. The indicator can also reflect differences in occupational preferences between genders.

Education mismatch and segregation index

The Statistical Office of Country A has published youth employment data disaggregated by occupation and education level as follows:

Youth (aged 15–24) employed by occupation and highest educational attainment, thousands, Year T

ISCO-08 Major Groups		ISCED 0-2	ISCED 3-4	ISCED 5-6
1	Managers	-	30.0	28.7
2	Professionals	-	9.7	203.3
3	Technicians and associat professionals	2.1	132.6	56.3
4	Clerical support workers	4.8	123.4	18.4
5	Service and sales workers	16.1	221.0	13.2
6	Skilled agricultural, forestry, fishery workers	100.3	66.6	2.9
7	Craft and related trades workers	18.2	139.2	3.7
8	Plant and machine operators and assemblers	28.2	105.2	2.0
9	Elementary occupations	43.0	57.6	1.8
	Total employed	1 428.3		

The office also released detailed information on youth employment by occupation. The table below summarizes the figures for youth aged 15–24 of Country A and those of the country leader in gender equality in the region.

Young men and women managers, thousands, 2012

	COUNTRY A	LEADER
Males, total	178.3	247.0
Males, managers	1.1	2.2
Females, total	122.4	250.7
Females, managers	0.7	2.3

What is the extent of the education mismatch for youth? What is the sex segregation index for managers in Country Å? How does it compare to the country that is leader in gender equality?

Suggested answer

✓ It is not possible to calculate precisely the mismatch as the ISCED education levels are grouped in pairs. However, if one excludes the cells that are problematic (e.g. ISCED 0-2 for elementary occupations and ISCED 5-6 for technicians), as shown below, a conservative estimate of the mismatch is 99 600 young workers, equal to 6.9 per cent of all young workers.

Youth employed by occupation and highest educational attainment, thousands, Year T

ISCO-08 Major Groups		ISCED 0-2	ISCED 3-4	ISCED 5-6
1	Managers	-	30.0	28.7
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	Total employed	1 428.3		

✓ The sex segregation index in Country A is 0.4 (=1.1/178.3 – 0.7/122.4 *2), while in the leader country the index is 0.1 (=2.2/247.0- 2.3/250.7*2). This means that sex segregation in Country A is higher than in the country that is leader in equality.

Glossary

Vulnerable employment
Vulnerable unemployment measures the share of own account workers plus contributing family members over total employment.

Status in employment
Status in employment is the categorization of individual employed persons according to the type of job held: (i) wage employment (employees), (ii) employers, (iii) own account work, (iv) contributing family members and (v) members of producing cooperatives.

Employment by branch of economic activity
Also called employment by economic sectors, this reflects the type of establishment where individuals work. The typical disaggregation is by main branch (e.g. agriculture, industry and services).

Employment by occupation
Employment by occupation refers to the type of work done by individuals employed. Data are typically disaggregated by the nine major groups of the ISCO-08 classification.

Over- and under-education
Over- and under-education refers to a situation where an individual has more or less education than the current job requires (measured in years).

Over-skilling
Over-skilling describes a situation where an individual is not able to fully utilize the skills and abilities at their disposal in their current job.

Under-skilling
An individual who is under-skilled lacks the skills and abilities necessary to perform the current job to acceptable standards.

Skills shortage/surplus
In cases of skills shortages or surpluses, the demand/offer for a particular type of skill exceeds the supply/demand of available people with that skill.

Skills gap
A skills gap occurs when the level of skills of the currently employed person is less than that required to perform the job adequately, or the type of skill does not match the requirements of the job.

Vertical mismatch
Vertical mismatch occurs when the level of education or skills is less or more than that required to perform a job adequately.

Horizontal mismatch
Horizontal mismatch occurs when the level of education or skills matches the job requirements, but the type of education or skills is inappropriate for the current job.

Occupational segregation index
This index measures the extent to which the labour market is separated into “male” and “female” occupations.

Additional reading

CEDEFOP: *The skill matching challenge. Analysing skill mismatch and policy implications* (Luxembourg, CEDEFOP, 2010) Available at www.cedefop.europa.eu/EN/Files/3056_en.pdf

R. Desjardins and K. Rubenson: "An Analysis of Skill Mismatch Using Direct Measures of Skills", OECD Education Working Papers No. 63 (Paris, OECD, 2011). Available at:
http://dx.doi.org/10.1787/5kg3nh9h52g5-en

EU Commission: Gender segregation in the labour market. Root causes, implications and policy responses in the EU (Luxembourg, EU Commission, 2009).

ILO: Measuring decent work, Discussion Paper for Tripartite Meeting of Experts on the Measurement of Decent Work, Geneva, International Labour Office, 8–10 September 2008.

ILO: Global employment trends, 2013 (Measuring skills mismatches) (Geneva, ILO, 2013). Available at:
www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_202326.pdf

Module FIVE

Labour demand: Job vacancies

At the end of this module, readers will be able to:

- analyse job vacancies trends by industry; and
- examine the relationship between the vacancy rate and unemployment rate at national level (Beveridge curve).

Learning exercises:

Analysing vacancy trends by industry for youth employment.

Duration:

120 minutes.

Job vacancies

The number of job vacancies reflects the unmet demand for labour. A large number of job vacancies is indicative of a growing economy, and indicates that employers are confident about the future and are prepared to expand their activities and hire more workers. In contrast, a small number of job vacancies is a sign of economic recession with employers more pessimistic about the future. Job vacancies also reflect potential mismatches between the skills of the unemployed population and the skills and requirements demanded by employers.

The sources of job vacancy data may be grouped into three broad categories:

- ***Statistics derived from specially designed establishment surveys***, where employers are asked about the number and characteristics of the job vacancies in the establishment based on a specific definition of job vacancy (e.g. a job that is open, available for immediate filling on the date of the survey and for which recruitment action has been taken);

- ***Statistics derived as part of the administrative process of public or private employment offices***, where employers notify their job vacancies for potential recruitment; and

- ***Statistics obtained from surveys and reviews of job advertisements*** in national and local newspapers.

The nature of job vacancies is such that no single source of data can be comprehensive. This is because many vacant jobs are filled by word of mouth or by processes that include only those people currently employed by the enterprise.

Job vacancy data are generally disaggregated by economic activity, occupation, size of enterprise and geographical region. Job vacancies are only rarely disaggregated by sex (job vacancies for men, job vacancies for women, and job vacancies for both men and women) and almost never by age category.

There are three main methods for analysing job vacancies: (i) vacancy trends; (ii) vacancies by industry; and (iii) the Beveridge curve.

Tips

Statistics on vacancies derived from the operations of public employment offices can also be used to measure vacancy trends and build Beveridge curves. However, it has to be kept in mind that the vacancies posted with employment offices usually account for about half of total vacancies available in a country.

Data on job vacancies are also collected by occupational skills surveys; however, the definition of job vacancy is not always in line with international standards, as these survey simply record the responses of enterprises to the question "How many job vacancies are currently open in the establishment?"

Vacancy trends

The following example shows how job vacancy trends can be plotted. The data are drawn from quarterly job vacancy surveys that calculate the total number of vacancies (defined according to international standards). In the first quarter of year T13 there were approximately 500,000 job vacancies, down from more than 670,000 recorded in April–June T1. The steepest drop in the number of job vacancies occurred between April–June T7 and April–June T9 (over 36 per cent). Thereafter, the number of job vacancies started to climb again.

Vacancies by industry

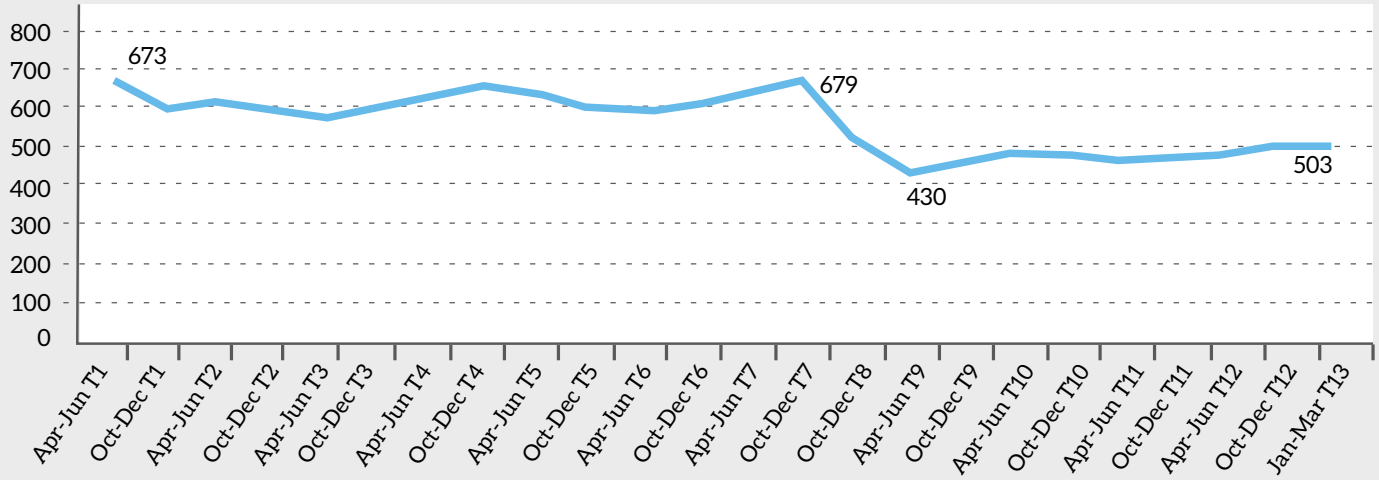
Job vacancies data can also be analysed by branch of economic activity and in terms of rates rather than absolute numbers. The job vacancy rate is the ratio of the number of job vacancies to the sum of employment and job vacancies, for example:

$$\text{Job vacancy rate: } = \frac{\text{N.º job vacancies}}{\text{N.º employement} + \text{N.º job vanancies}}$$

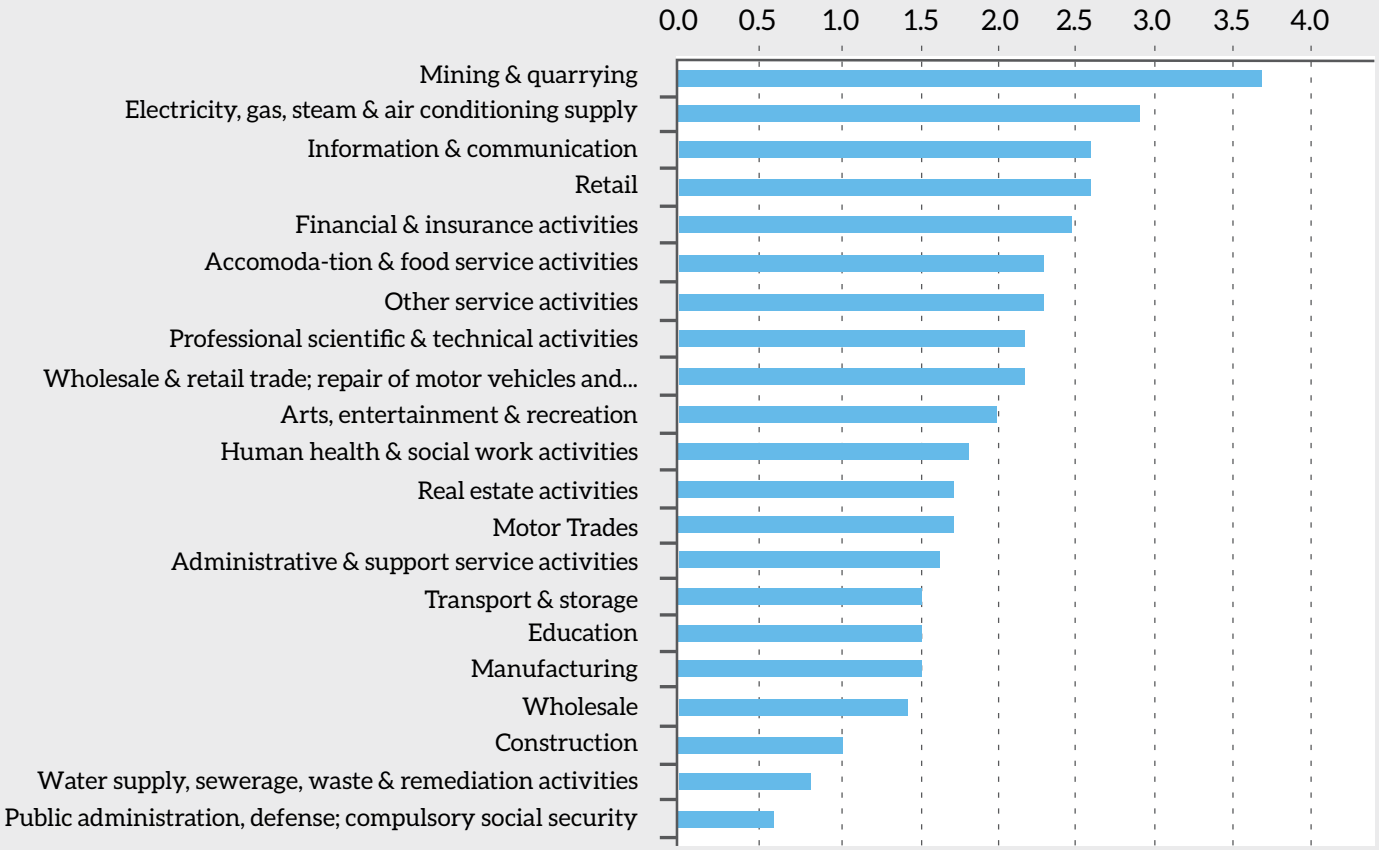
The job vacancy rate reflects the fraction of jobs in the economy that are unfilled, similar to the unemployment rate, which shows the percentage of people in the labour force who are seeking jobs. The job vacancy rate may be measured for the economy as a whole or for each branch of economic activity separately, as shown in the example below.

The industry with the highest job vacancy rate in the first quarter of year T13 was mining and quarrying (3.7 per cent), followed by electricity and gas supply (2.9 per cent). Public administration and defense (0.6 per cent) and water supply, sewage and waste (0.8 per cent) recorded the lowest rate. The industry job vacancy rate may be analysed over time to identify expanding and contracting industries, or to detect industries with fastest and earliest signs of expansion, or to detect industries with signs of other combinations of speed, timing and direction of vacancy trend.
Job vacancy rate, first quarter T13

Job vacancy trends T1–T13 (thousands)



Job vacancy rate, first quarter T13



Beveridge curve

The Beveridge curve measures the relationship between the job vacancy rate and the unemployment rate. It is often used as a summary measure of the labour market, providing information on the business cycle.

In a scatter plot with the vacancy rate on the vertical axis and the unemployment rate on the horizontal axis, the curve typically slopes downwards to reflect the empirical fact that unemployment increases with a lower rate of vacancies and vice versa.

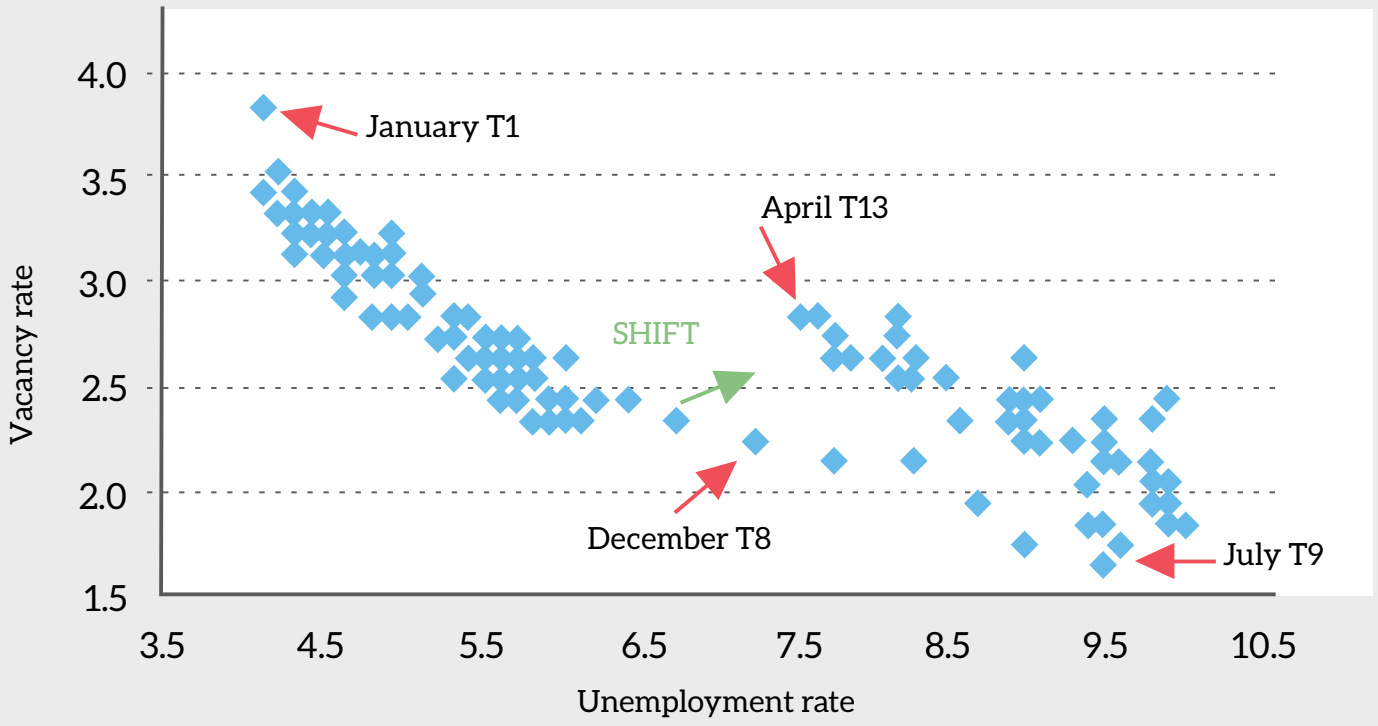
The Beveridge curve plotted in the next page uses monthly vacancy and unemployment rates for the period T1–T13. From December T8 through the end of T9, each month's point on the curve moved lower and further to the right as the job openings rate declined and the unemployment rate rose. In the period T10–T13, the point moved up and to the left as the job openings rate increased and the unemployment rate decreased. Such an outward shift in the Beveridge curve may be due to a greater mismatch between available jobs and the unemployed in terms of skills or location, or that employers are delaying hiring due to economic uncertainty.

Beyond this short-run relationship, the vacancy rate and the unemployment rate can also exhibit a different long-term pattern where a high vacancy rate co-exists with a high unemployment rate. This happens when the job-matching process is slow and the labour market cannot match the unemployed to vacant jobs.

The Beveridge curve can also shift because of changes in the labour force participation rate, or as a result of long-term unemployment. As the labour force increases relative to the working age population, the number of persons looking for work may increase more than in proportion, thus increasing the unemployment rate and shifting the Beveridge curve outward from the origin.

A reverse movement occurs, for example, when labour mobility tightens, with few employers laying-off workers and few workers leaving their jobs. In such a situation, both the number of firms searching for employees and the number of unemployed searching for jobs decrease, causing the Beveridge curve to shift towards the origin.

Beveridge curve, T1–T13



Analysing job vacancy trends by industry for youth employment

Country B regularly publishes employment and job vacancies statistics on their web page. The data are collected quarterly and published on a quarterly and annual (seasonally adjusted) basis. The overall number of employed and job vacancies for the most important industries are summarized in the next page.

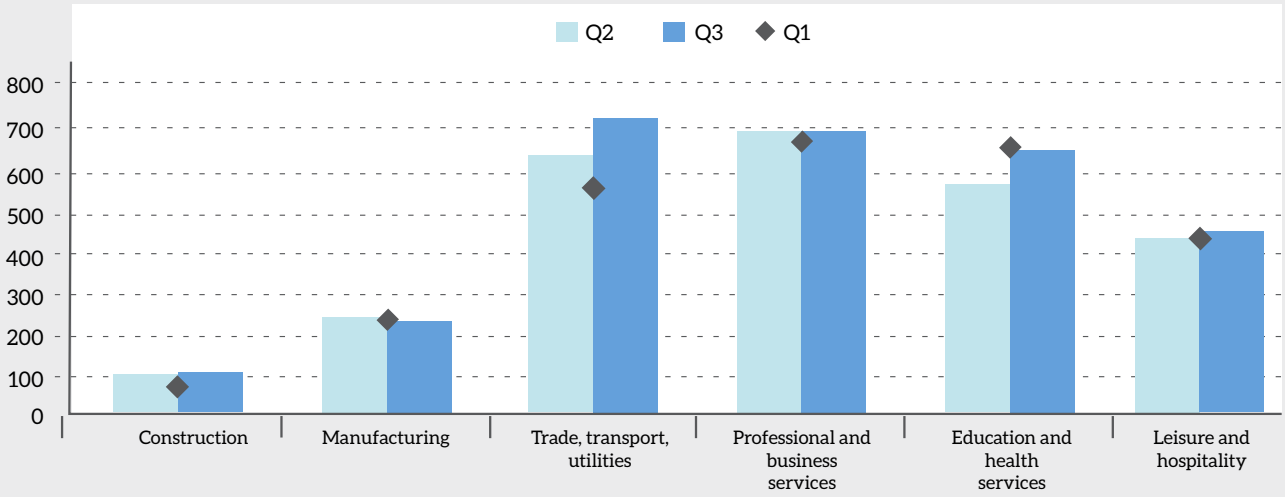
Job vacancies and employment by industry (Q1–Q3), thousands

JOB VACANCIES	Q1	Q2	Q3
Total private sector	2 667	2 724	2 873
Construction	67	104	108
Manufacturing	254	253	245
Trade, transport and utilities	552	645	711
Professional and business services	668	690	692
Education and health services	674	579	652
Leisure and hospitality	452	453	465
Employment	Q1	Q2	Q13
Construction	6, 86.4	5 525.6	7 365.1
Manufacturing	17 262.9	11 524.0	11 450.9
Trade, transport and utilities	25 623.6	24 053.1	27 418.6
Professional and business services	27 984.2	27 029.1	31 758.8
Education and health services	15 108.9	19 564.1	26 022.7
Leisure and hospitality	11 861.6	13 019.6	14 362.3

What can be said about job vacancies trends? How can the vacancy figures be presented visually? Which sectors created more openings in the first three quarters of the year? What are the vacancy rates by industry and quarters?

Suggested answer

✓ Overall, the number of vacancies in the last three quarters increased by 7.7 per cent (approximately 200,000 job vacancies opened in this period), with trade, transport and utilities contributing the most to total vacancies (159,000 new openings or 77 per cent of the total), followed by construction (41,000 openings), and professional and business services (24,000 vacancies). The data can be presented visually as a bar chart using Quarter 1 as benchmark to visualize increases/decreases.



✓ The vacancy rates (e.g. the percentage of vacancies over the sum of vacancies and employed) by industry and quarters are shown in the following table. The industry with the highest job vacancy rate was leisure and hospitality, followed by trade, transport and utilities, and education and health services.

Job vacancies rate by industry (Q1–Q3)

Job vacancy rate	Q1	Q2	Q3
Total	2.5	2.6	2.4
Construction	1.0	1.8	1.4
Manufacturing	1.5	2.1	2.1
Trade, transport and utilities	2.1	2.6	2.5
Professional and business services	2.3	2.5	2.1
Education and health services	4.3	2.9	2.4
Leisure and hospitality	3.7	3.4	3.4

Glossary

Job vacancy

According to international standards a job vacancy is a paid post that is newly created, unoccupied, or about to become vacant: (i) for which the employer is taking active steps to find a suitable candidate from outside the enterprise concerned; and (ii) which the employer intends to fill either immediately or within a specific period of time.

Beveridge curve

This curve measures the relationship between the job vacancy rate and the unemployment rate. The curve reflects the empirical fact that unemployment normally increases with a lower rate of vacancies and vice versa.

Additional reading

A. Machin: "*The vacancy survey: A new series of national statistics*", *Labour Market Trends*, pp. 349–362 (London, Office for National Statistics, July 2003).

Module SIX

Conditions of work: Hour of work, wages and informal employment

At the end of this module, readers will be able to:

- measure the share of young people working excessive hours;
- analyse low-paid work and working poverty;
- assess the engagement of young people in the informal economy; and
- compute the returns to education.

Learning exercises:

Analysing decent work for youth.

Duration:

180 minutes.

Hours of work

The international definition of employment covers all work durations (starting from one hour a week). For this reason, it is important that employment is analysed in conjunction with data on work hours to distinguish the various intensities of employment. This distinction is particularly important in the case of young people, as many work short hours in odd jobs.

Data on work hours are necessary to calculate time-related underemployment and average wage per hour, so that the resulting wage data are comparable across categories of young people and between young people and adults. International standards on measurement of working hours include several different concepts relating to work hours:

- **Contractual hours of work** refers to the expected hours of work performed under a contract for paid employment or for provision of services in a self-employment job.

- **Normal hours of work** are hours fixed by or in pursuance of laws or regulations, collective agreements or arbitral awards. The concept also applies to self-employment where hours are fixed for all jobs in a specific industry or occupation (such as for drivers to ensure public safety).

- **Hours usually worked** represents the hours actually worked in a job during a typical week. It can be calculated as the most frequent number of hours/week that a person actually worked during the past month.

- **Actual hours worked** is the time spent in a job for the performance of activities that contribute to the production of goods and/or services during a specified reference period. It includes the direct hours that the person is engaged in the activities, as well as hours such as waiting time, on-call time, and rest and short-break periods. It excludes annual and sick leave, public holidays, and commuting time between work and home, as well as longer breaks.

- **Hours paid** for a paid-employment job describes the time for which payment is received by the employer (at normal or premium rates, in cash or in kind) regardless of whether the hours were actually worked or not. It includes annual leave, paid public holidays and paid sick leave, but excludes unpaid overtime, unpaid educational leave and maternity leave unpaid or paid through social security systems.

The next example highlights the differences across the various categories of hours worked.

Different concepts of hours of work

CONTRACTUAL HOURS OF WORK							
M	T	W	T	F	S	S	Tot
9am	9am	9am	9am	9am	-	-	
5pm	5pm	5pm	5pm	5pm	-	-	
8	8	8	8	8	0	0	40

HOURS ACTUALLY WORKED							
M	T	W	T	F	S	S	Tot
9am	9am	9am	Leave		9am	-	
6pm	6pm	6pm	Leave		12am	-	
9	9	9	0	0	4	0	31

HOURS USUALLY WORKED							
M	T	W	T	F	S	S	Tot
9am	9am	9am	9am	9am	9am	-	
5pm	5pm	5pm	5pm	5pm	12am	-	
8	8	8	8	8	4	0	44

HOURS PAID FOR							
M	T	W	T	F	S	S	Tot
9am	9am	9am	Leave		9am	-	
6pm	6pm	5pm	Leave		12am	-	
9	9	8	0	0	0	0	42

1 h paid overtime

Saturday not paid

Tips

Data on hours usually and actually worked at the main job are collected through labour force surveys, making these the most analysed figures.

Data on contractual hours and hours paid are collected through establishment surveys and administrative registers. These sources sometime also provide data on normal hours of work and hours actually worked.

Long hours of work

Long hours of work constitute one of the core indicators of decent work. Long hours of work can be a threat to physical and mental health; they can interfere with the balance among work, study and family life; and often signal an inadequate pay rate.

The cut-off point adopted for measuring long hours of work (or "excessive hours of work" is 48 hours per week. As an indicator of decent work, long hours of work should be measured on the basis of hours usually worked in all jobs rather than hours actually worked.

Income from employment

Employment-related income covers all forms of payment – in cash, in kind or in services – received by individuals as a result of their involvement in paid jobs or self-employment.

It consists of income related to paid employment and includes: earnings, profit-related pay, income related to self-employment including gross profit (or share of profit), remuneration received by owner-managers of corporations or quasi-corporations, and employment-related social security benefits received directly from an employer, social security, compulsory insurance schemes or the state. It excludes income derived from property income, annuities, gifts and allowances paid by social security schemes or the state without regard to employment status. There are three aspects to wages:

- ***The wage rate*** refers to the rate of pay per period of time or unit of production for an employee on a given job. It includes basic wages, cost-of-living allowances, and other guaranteed and regularly paid allowances. It excludes overtime payments, bonuses and gratuities, family allowances and other social security payments by employers, and payments in kind supplementary to normal wage rates.

- ***Earnings*** are remuneration in cash or in kind paid to employees for time worked or work done together with remuneration for time not worked such as annual vacation and other paid leave or holidays. They include direct wages and salaries, remuneration for time not worked, bonuses and gratuities, and payments in kind. It excludes employers' contributions to social security and pension schemes, and severance and termination pay.

- ***Labour cost*** is the cost incurred by the employer for employing labour. It includes earnings (as defined above), employers' social security expenditure, the cost of vocational training, taxes on labour, and other expenditures such as transport, protective clothing and recruitment. There are three measures of labour costs:

  - Basic labour cost defined as average labour cost per worker;

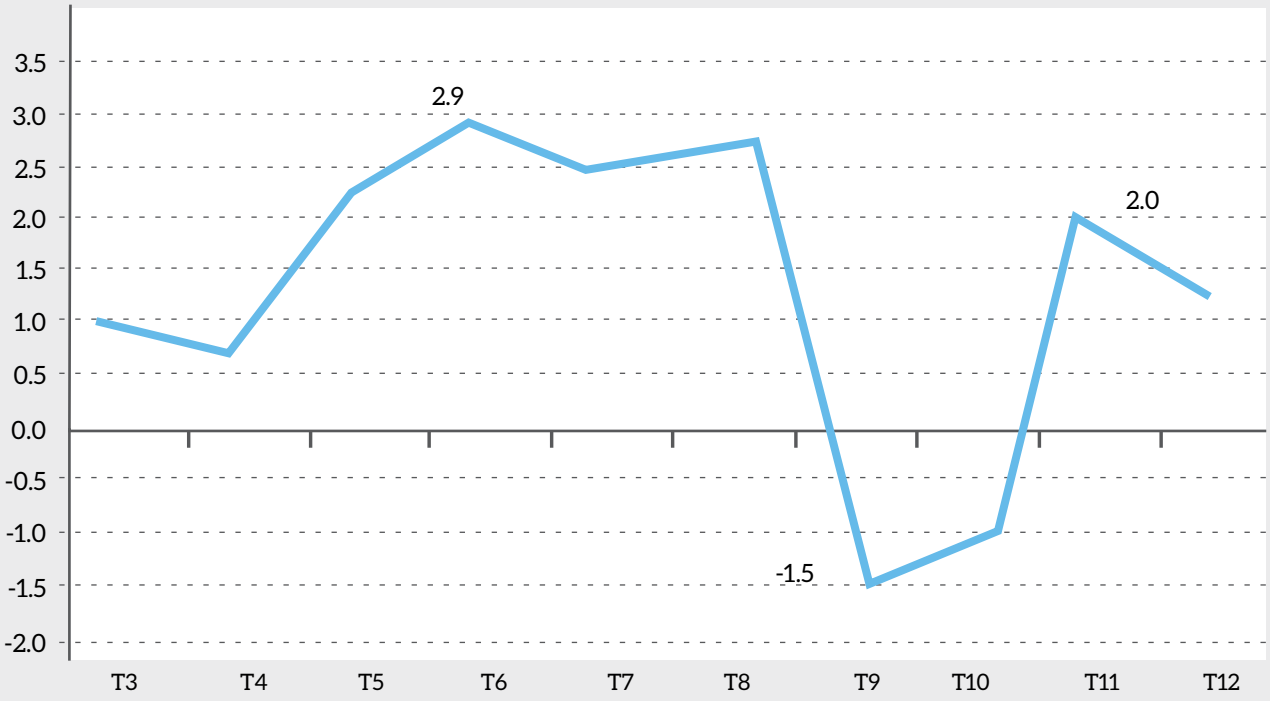
  - Hourly labour cost defined as average labour cost per hour worked; and

  - Unit labour cost defined as average labour cost per unit of output.

Changes in labour costs are often measured by a labour cost index, defined as the change in labour cost during a given period adjusted for employment shifts among occupations and branches of economic activity in that period.

The following example shows the percentage change in unit labour costs over a decade. Since this indicators measures the change of labour cost per unit of output, the sharp drop recorded in year T9 reflects a decline in output, but also in total hours worked (and therefore lower costs).

Percentage change in unit labour costs (T3–T12)



Low pay

Because they are at the beginning of their working life and have limited work experience, young people generally receive relatively low income from employment. Another factor in this regard is hours of work: young people combining work and school tend to work shorter hours. In this context, low hours of work should not be confused with low pay.

When analysing low pay among youth, it is important to distinguish between different categories of low earners.

1. Full-time employed with low earnings

This category is defined as all young workers who during the reference week were:

- usually working 40–48 hours per week at all jobs; and
- whose total monthly earnings at all jobs were less than a specified threshold. The threshold is two-thirds of the median monthly earnings of all employed persons during the reference week with usual hours of work were between 40 and 48 per week.

The threshold of low earnings is defined in terms of the distribution of monthly earnings of full-time workers to accommodate different national rules regarding minimum pay and differences in hours of work. Since the median of the distribution determines the relative position of a typical worker in that distribution, national rules regarding minimum pay are indeed tied to that median. Formulating the indicator in terms of a percentage of the median makes it independent of national currencies and facilitates international comparison. It has the virtue of simplicity and wide applicability, including in countries that have either not adopted minimum wage legislation or have set the statutory minimum wage far below the prevailing market wage.

2. Less than full-time employed with low earnings

Employed persons working less than full-time may also have low earnings, even if they worked full-time during the period. This category of low earners is defined as all employed persons who during the reference week were:

- usually working less than 40 hours per week at all jobs; and
- whose hourly earnings were less than a specified threshold consistent with the monthly threshold of full-time workers specified earlier. It can be calculated as the ratio of the threshold of low monthly earnings of full-time workers to the average hours of work per week of full-time workers, multiplied by 52/12.

3. Overly employed with low earnings

The third category of low earners comprises those working more than the typical number of hours for full-time work. Two groups may be distinguished: (i) those working very long hours for little earnings, and (ii) those who are earning above the threshold, but have that level of earnings only because they are working very long hours (i.e. to compensate for low hourly earnings).

These two groups of overly employed workers with low earnings are defined as all employed individuals who during the period were:

- usually working more than 48 hours per week at all jobs; and
- whose monthly earnings at all jobs were less than the threshold of low monthly earnings of full-time workers, or whose hourly earnings at all jobs were less than the threshold of low hourly earnings of less than full-time workers determined earlier.

How to calculate the share of low-paid workers

The first step to measure the share of young low-paid workers is to calculate the median monthly earnings of all workers (usually working 40–48 hours per week). This requires listing all monthly earnings in value order (from the lowest to the highest). The median is the "middle" value, as shown below:

N.	Monthly earnings	Explanation
1	4 795	Since the list of values is even (10 monthly wages) the middle numbers are 9 002 and 10 132. The median is the average of these two numbers (e.g. 9 567).
2	4 842	
3	5 961	
4	8 968	
5	9 002	
6	10 132	
7	10 203	
8	10 218	
9	11 256	
10	13 298	

The second step is to see how many young people are working (usually 40–48 hours), but are earning below two-thirds of the median monthly wage (that is 6,378). For example, in the list of 10 workers above, the first three are low-paid workers.

Returns to education

The question of the productivity of education is central to the analysis of youth employment and to understanding the relationship between education structures and labour markets.

A key issue is the social returns to education, defined as the increase in total output due to an increase in years of schooling among the working population.

Another issue is private returns to education, defined as the increase in earnings due to increased years of schooling among individual workers. This latter relates to the signals the labour market sends to youth, their families and education practitioners, in terms of rewards from education, and the levels of earnings that motivate young people to continue or abandon schooling.

The standard model that links earnings with school level and work experience is the Mincer earnings function:

$$w(x,s) = \beta_o + \beta_1 x + \beta_2 x^2 + \rho_s s + \varepsilon$$

where w(s,x) is the logarithm of wages at school levels and work experience x;

ρ_s is the "rate of return of school" (assumed to be the same for all school levels);

β_o, β_1, β_2 are parameters that control for the general level of wages and the increments due to work experience; and

ε represents a variable residual term with expected value $E(\varepsilon|s;x) = 0$.

The Mincer model has been widely used in empirical economics and draws on data from a variety of countries and time periods. The estimates require data on earnings (standardized for differences in hours of work), number of years of work experience, and level of schooling (measured in number of years of school or level of educational attainment). The model generally produces separate estimates for men and women, and for particular categories of individuals.

Table 6.1 shows results for white and black men in the United States, and is based on data on decennial population censuses taken over six decades from 1940 to 1990. The last column shows that, on average, one year of school had the effect of increasing the earnings of white men by about 11–13 per cent and of black men by about 9–15 per cent. The return from schooling has steadily increased for black men but has somewhat fluctuated for white men.

Table 6.1 Estimated coefficients from Mincer log earnings regression, United States 1940–90

Year	Intercept	Work experience	Work experience squared	Years of school
	βo	β1	β2	ρs
White men				
1940	4.4771	0.0904	-0.0013	0.1250
1950	5.3120	0.1074	-0.0017	0.1058
1960	5.6478	0.1156	-0.0018	0.1152
1970	5.9113	0.1323	-0.0022	0.1179
1980	6.8913	0.1255	-0.0022	0.1023
1990	6.8912	0.1301	-0.0023	0.1292
Black men				
1940	4.6711	0.0646	-0.0009	0.0871
1950	5.0716	0.0933	-0.0014	0.0998
1960	5.4107	0.1035	-0.0016	0.1034
1970	5.8938	0.1074	-0.0016	0.1100
1980	6.4448	0.1075	-0.0016	0.1176
1990	6.3474	0.1109	0.0017	0.1524

Source: J.J. Heckman, L.J. Lochner and P.E. Todd: Fifty years of Mincer earnings regressions, 2003, at www.econstor.eu/bitstream/10419/21464/1/dp775.pdf

Comparison of the "years of school" and "work experience" columns shows that schooling generally had a lower impact on earnings compared to work experience among white men throughout the period. The opposite is true for black men, for whom school has a higher impact on earnings than work experience.

Finally, the negative values of the "work experience squared" column confirm the fact that, after a certain level, work experience had a diminishing effect on the change in earnings, throughout the period, for white men and black men alike.

Working poor

The working poor are defined as individuals who are employed but earn an income below the poverty line, as established at national level or by the international poverty line ($1.25 or $2 a day). An example of how to present data on the working poor is given in the next page.

The data indicate that youth are more likely to be working poor compared to adults, and that youth from national minorities are much more likely to be working poor compared to their national majority peers. Young workers are more vulnerable to poverty than are older age groups, in part because earnings are lower and their unemployment rate is higher. Achieving higher levels of education usually reduces the incidence of living in poverty.

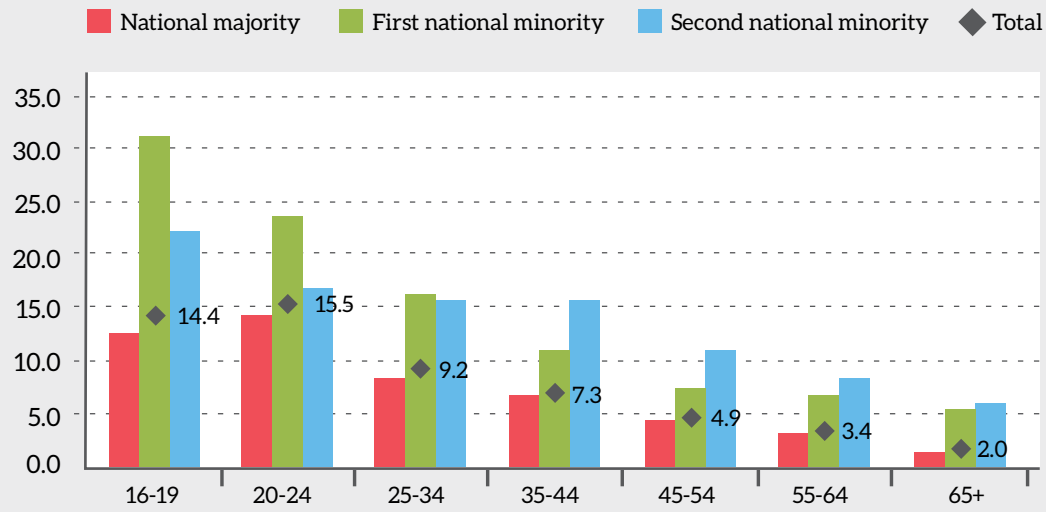
The global employment trends for youth compiled by the ILO in collaboration with the World Bank (2010) provide a set of national estimates of the working poor. The estimates are based on a consistent methodology and definition of poverty ($1.25 per day at purchasing power parity).

These data reveal that young people have a higher likelihood than adults of being among the working poor in virtually every country covered. The ILO estimates that in 2012 approximately 220 million young workers were living in poor households (with per-capita expenditure below $2.25 a day). The working poverty rate at $2.25 among youth (share of working poor youth in total youth employment) was 40 per cent in the same year.[5]

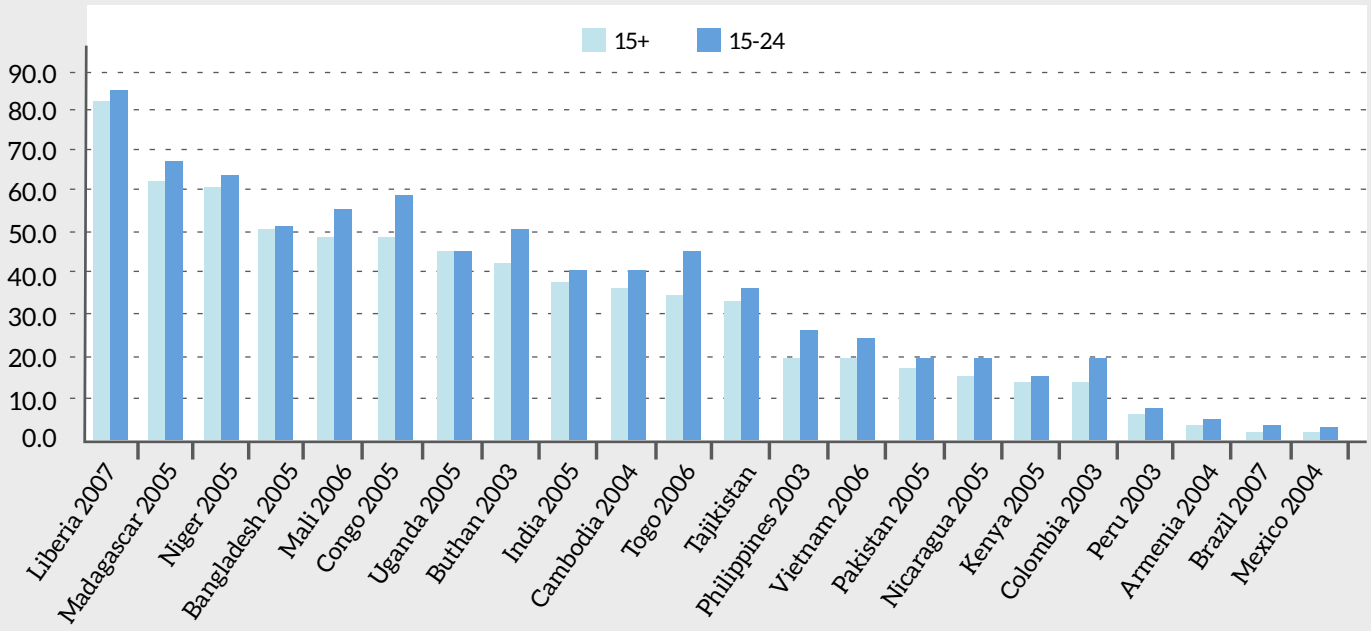
The higher labour force participation rates of the young working poor, most of which are engaged in the agricultural sector, reflect lost opportunities for many of the youth who might otherwise attend school and acquire skills and education that could raise their future productivity and potential earnings. Many young working poor lacked even a primary-level education.

[5] The same definition is used for monitoring progress towards the Millennium Development Goals. The ultimate aim is to improve the understanding of poverty-employment linkages in developing countries throughout the world, with all estimates disaggregated by age and sex.

Working poor by national origin and age group



Working poor by national origin and age group



Source: ILO, Global employment trends for youth (Geneva, ILO, 2010).

Informal employment

Many young people who are unable to find a job with sufficient income try to earn a living in the informal economy, for instance, as an apprentice or temporary part-time employee, or as a casual worker without a contract, or sometime as a home-based producer, street vendor, waste collector or domestic worker in another household.

A useful concept that encompasses most of these activities is "informal employment". According to international statistical standards on the topic, informal employment is defined in the case of employers and own-account workers in terms of the characteristics of their enterprise, and in the case of employees in terms of the characteristics of their employment relationship.[6] Other categories of workers also considered to be informal workers are: contributing family workers, members of informal producers' cooperatives, and own account workers engaged in the production of goods exclusively for use by their own household.

For operational purposes, informal own account enterprises are defined as either all own account enterprises or only those not registered under specific forms of national legislation. Enterprises of informal employers are defined in terms of one or more of the following criteria: (i) size of the unit below a specified level of employment; and (ii) non-registration of the enterprise or its employees.

The employment relationship is informal if, in law or in practice, it is not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits (advance notice of dismissal, severance pay, paid annual or sick leave and so on).

Informal employment is, therefore, a broad concept that includes;

- ***Employment in the informal sector*** (except those rare employees in that sector who may have formal employment); and
- ***Informal employment outside the informal sector***.

The term informal economy, although not explicitly defined, may be interpreted to refer to the union of informal employment and employment in the informal sector.

Data on informal employment are usually scarce. The available figures at national level show that informality among young workers is normally higher than among adults. Informality decreases not only with age, but also with education (with low educated youth more likely to be working informally compared to youth with higher educational attainment). An example of this trend is given in the next page.

Informal employment, total employed and young workers (T1–T10)

Decent work indicators

In the last decade, substantial efforts have been devoted to translating the concept of "decent work" into measurable dimensions. A set of 58 indicators were developed organized around 10 areas (economic and social context for decent work; employment opportunities; adequate earnings and productive work; decent working time; work that should be abolished; stability and security of work; equal opportunity and treatment in employment; safe work environment; social security; and social dialogue, workers' and employers' representation).

Table 6.2 provides a complete list of decent work indicators. All the indicators listed are relevant for the analysis of youth employment.

Four of the main indicators directly concern the youth population:

- ***Youth not in education and not in employment***, aged 15–24 years old;
- ***Youth unemployment rate***, for ages 15–24 years old;
- ***Child labour***;
- ***Hazardous child labour***; and
- ***Worst forms of child labour***.

The first two have already been analysed in the previous modules of this training guide. The other three on child labour concern children (aged 5–14 years old) as well as young people (aged 15–17 years).

In the case of young persons in the category aged 15–17 years old, child labour is defined in terms of hazardous work and other worst forms of child labour, including debt bondage, forced labour, child prostitution, pornography, trafficking of drugs and other illicit activities.

The ILO global estimation of child labour measures the hazardous work of children using three criteria: (i) work in designated hazardous industries (mining and quarrying, and construction); (ii) work in designated hazardous occupations; and (iii) long hours of work (more than 43 hours of work per week).

The 60 results-based datasets cover 50 countries and show that, globally, some 62 million teenagers aged 15–17 years were working in hazardous conditions in 2008, up from 52 million in 2004. The incidence of hazardous work among youth aged 15–17 years old was 53.9 per cent among boys and 40.1 per cent among girls.

Table 6.2 Decent work indicators

AREAS	INDICATOR
Economic and social context	• Children not in school (percentage by age) • Estimated percentage of working-age population who are HIV-positive • Labour productivity (GDP per employed person, level and growth rate) • Income (consumption) inequality (percentile ratio P90/P10) • Inflation rate (CPI) • Employment by branch of economic activity • Education of adult population (adult literacy rate, adult secondary school graduation rate) • Labour share of GDP • Real GDP per capita in PPP$ (level and growth rate) • Female share of employment by economic activity (ISIC) • Earnings inequality (percentile ratio P90/P10) • Poverty measures
Employment opportunities	• Employment-to-population ratio • Unemployment rate • Youth not in education and not in employment • Informal employment rate • Labour force participation rate • Youth unemployment rate • Unemployment by level of educational attainment • Employment by status in employment • Proportion of own account workers and contributing family workers in total employment • Share of wage employment in non-agricultural employment
Adequate earnings and productive work	• Working poverty rate • Low pay rate • Average hourly earnings in selected occupations • Average real wages • Minimum wage as percentage of median wage • Manufacturing wage index • Employees with recent job training (past year)
Decent working time	• Employment in excessive working time (more than 48 hours per week) • Employment by weekly hours worked (hours in standardized hour bands) • Average annual working time per employed person • Time-related underemployment rate
Work that should be abolished	• Child labour rate • Hazardous child labour rate • Rate of worst forms of child labour other than hazardous work • Forced labour rate • Forced labour rate among returned migrants
Stability and security of work	• Precarious employment rate • Job tenure • Subsistence worker rate
Equal opportunity and treatment	• Precarious employment rate • Job tenure • Subsistence worker rate • Real earnings of casual workers
Safe work environment	• Occupational injury frequency rate, fatal • Occupational injury frequency rate, non-fatal • Time lost due occupational injuries • Labour inspection (Inspectors per 10 000 employed persons)
Social security	• Share of population above the statutory retirement age (aged 65 or above) benefiting from an old-age pension • Public social security expenditure (percentage of GDP) • Health expenditure not financed out of pocket by private households • Share of economically active population contributing to a pension scheme
Social dialogue	• Trade union density rate • Enterprises belonging to an employers' organization • Collective bargaining coverage rate • Days not worked due to strikes and lockouts

Source: ILO, Decent work indicators: concepts and definitions: ILO manual (Geneva, ILO, 2012).

MDG indicators

The UN Millennium Development Goal on employment aims to achieve full and productive employment and decent work for all, including women and young people. Four MDG indicators for monitoring progress are specified:

- ***Growth rate of GDP per person employed;***
- ***Employment-to-population ratio;***
- ***Proportion of employed people living below $1 (PPP) per day; and proportion of own account and contributing***
- ***Family workers in total employment.***

The last three indicators are discussed earlier in the context of employment and income from employment. The first indicator (labour productivity) is a general context indicator, not measurable for young people separately, as the share of youth labour input in the value of output (GDP) cannot be unambiguously defined and measured both in theory and in practice.

Analysing decent work

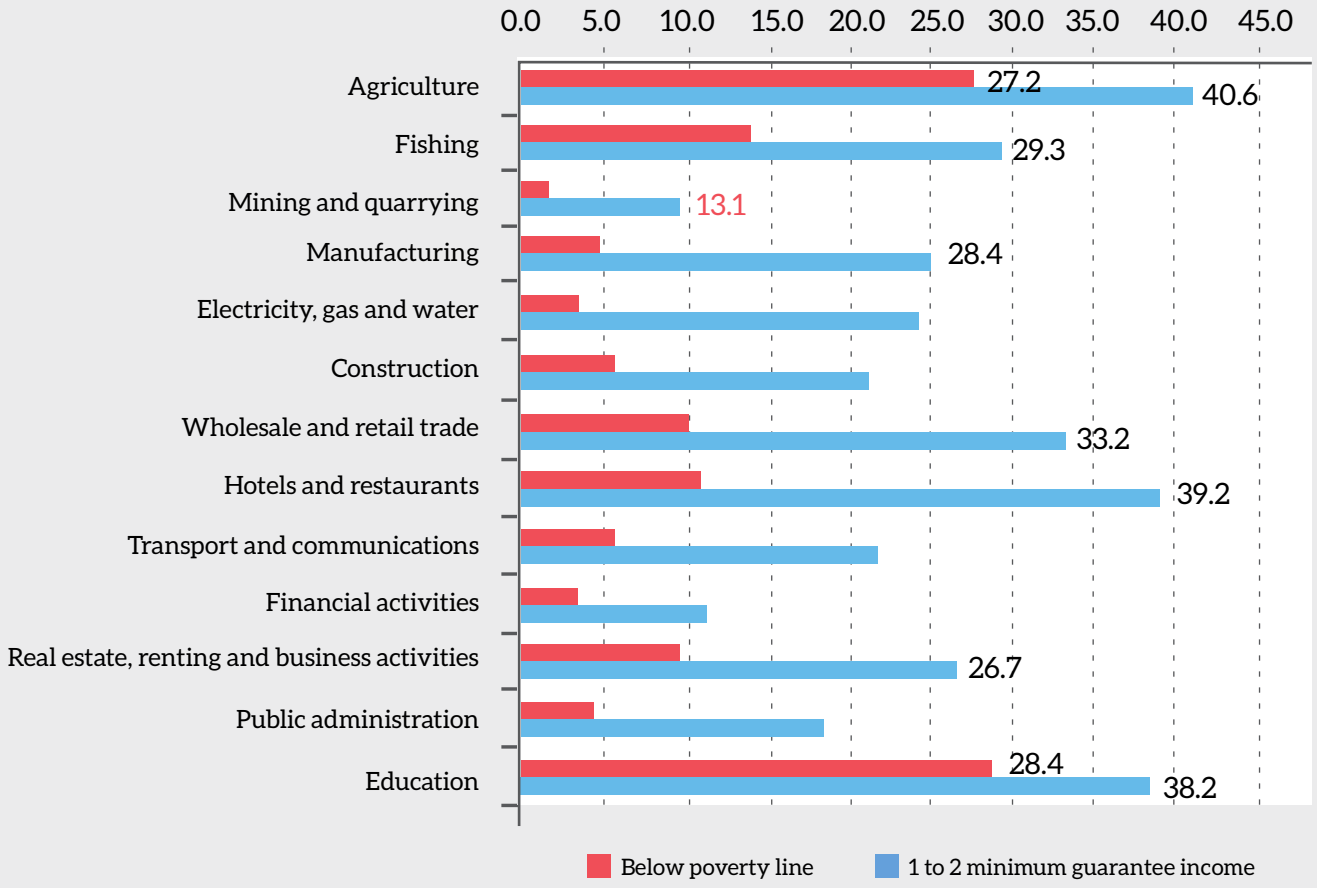
The Employment Department of Country B is conducting a labour market analysis as a precursor to formulating a Youth Employment Policy for the next five years. The overall youth population aged 15–24 comprises just over 31 million individuals (31,814,600 of which 16,543,800 are young women). A total of 9,544,600 are in the labour force (of which 51 per cent are young women). Of all young inactive persons (e.g. 22,270,000), 4 per cent are discouraged workers, 80 per cent are in school and another 16 per cent are inactive for other reasons. Of these latter, 7 per cent are willing to work. The following statistical figures on youth employment are available for the current year.

Branch of economic activity (thousands)	Total	Men	Women
Agriculture	1 726.9	724.8	1 002.1
Industry	2 798.4	1 434.9	1 363.5
Services	2 562.3	1 177.9	1 384.4
Status in employment (thousands)	**Total**	**Men**	**Women**
Employees	4 670.7	2 140.2	2 530.6
Employers and self-employed with employees	106.3	78.6	27.7
Own account workers	375.6	209.4	166.2
Contributing family members	1 934.9	909.4	1 025.5

The share of young workers in the informal economy is estimated by the Statistical Institute at 38.6 per cent of total youth employment (35.7 per cent for young women and 41.5 per cent for young men), well above the 21.6 per cent of adult workers. The share of part-time employment is 12.4 per cent (8.2 per cent of which is involuntary part-time work).

The poverty level is defined at national level at the level of the minimum guaranteed income. The share of young workers earning below this threshold in 13.1 per cent of total youth employment. Another 28.4 per cent of young workers earn one to two times the minimum guaranteed income (equivalent to 40 per cent of the average wage, or 24,315 local currency unit). The following figure plots the share of young working poor by branch of economic activity.

Working poor and low-wage workers (aged 15–24) by economic sector



Young workers earn on average 17,000 in local currency, while young women earn 14,450.
Based on the figures above, which type of youth labour market indicators can be calculated? What can be said about the extent of decent work for youth in the country? What other additional disaggregation of data and/or additional figures are needed to better understand the situation?

Suggested answer

✓ The figures provided above enable calculation of the key labour market indicators (labour force participation, employment and unemployment), labour slack, the share of vulnerable employment and the gender wage gap (15 per cent). The following table summarizes these indicators. Additional disaggregation would be needed by working poverty, low-paid work and part-time employment by sex, as well as by corresponding adult rates (to compare the situation of youth against that of adults).

Key indicators of the youth (aged 15–24) labour market

KEY INDICATORS	TOTAL	MEN	WOMEN
Labour force participation rate	30.0	30.6	29.4
Employment ratio	22.3	21.9	22.7
Unemployment rate	25.7	28.6	23.0
Inactivity	70.0	69.4	70.6
BRANCH OF ECONOMIC ACTIVITY	TOTAL	MEN	WOMEN
Agriculture	24.4	21.7	26.7
Industry	39.5	43.0	36.4
Services	36.2	35.3	36.9
STATUS IN EMPLOYMENT	TOTAL	MEN	WOMEN
Employees	65.9	64.1	67.5
Employers	1.5	2.4	0.7
Own account workers	5.3	6.3	4.4
Contributing family workers	27.3	27.2	27.3zx
OTHER INDICATORS	TOTAL	MEN	WOMEN
Labour slack	13.1	-	-
Vulnerable employment	32.6	33.5	31.8
Involuntary part-time	8.2	-	-
Informal employment	38.6	35.7	41.5
Working poor	13.1	-	-
Low paid workers	28.4	-	-

✓ The youth labour market figures show that young men are slightly more likely to be in vulnerable employment compared to women. However, these latter are more likely to work informally due to the fact that they are more likely to work in agriculture compared to men. Although working poverty data are not disaggregated by sex, the fact that women are more engaged in agriculture, in addition to services such as wholesale and retail trade, hotels and restaurants and education (the sectors with the highest incidence of working poverty and low-paid work), increases the likelihood that young women will be working poor or low-paid workers compared to their male peers.

✓ Figures disaggregated by educational attainment (especially for inactivity, unemployment, discouragement, working poverty and low-paid work) would allow determination of whether young people with a low level of education are more likely to face decent work gaps compared to their better educated peers.

Glossary

Actual and usual hours of work
Actual and usual hours of work are the two most analysed indicators on hours of work, as they are computed by national labour force surveys. Actual hours of work represent the actual time spent in a job (excluding different types of leave and longer breaks). Hours usually worked are the hours worked in a typical week.

Excessive hours of work
The international benchmark for excessive hours of work is set at 48 hours per week and over.

Unit labour costs
Unit labour costs are calculated by dividing total labour compensation by real output.

Private return to education
Private return to education is the increase in earnings produced by an increase in years of schooling and work experience at the level of the individual worker.

Informal employment
Informal employment includes all workers employed in the informal sector and employed informally outside the informal sector.

Working poor
The working poor are individuals who are employed but earn below the poverty line (either established at national level or by the international level of $1.25 USD or $2 per day).

Low-paid workers
Low-paid workers are the share of individuals working and earning below two-thirds of the median monthly wage.

Child labour
Child labour is defined as the proportion of children aged 5–14 years who are working.

Additional reading

D. Bescond, A. Châtaignier and F. Mehran: "*Seven indicators to measure decent work: An international comparison*", International Labour Review (Geneva, ILO, 2003/2).

J.J. Heckman, L.J. Lochner and P.E. Todd: "*Fifty years of Mincer earnings regressions*", 2003.

ILO: Decent work: *Report of the Director General, International Labour Conference*, 87th Session, Geneva, 2000.

ILO: Beyond unemployment: *Measurement of other forms of labour underutilization* (Geneva, ILO, 2008).

ILO: *Guide to the new Millennium Development Goals employment indicators* (Geneva, ILO, 2009).

ILO: *Global child labour developments*: Measuring trends from 2004 to 2008 (Geneva, ILO, 2010).

ILO: Decent work indicators: *Concepts and definitions: ILO manual* (Geneva, ILO, 2012).

Module SEVEN

Youth labour market dynamics

At the end of this module, readers will be able to:

- construct and analyse youth flows among different labour force statuses.

Learning exercises:

- Measuring the transition of youth from school to work.

Duration:

90 minutes.

Flow data

Understanding the difficulties encountered by young men and women in entering and remaining in the labour market requires flow data that show the dynamics of the labour force experience of youth over time. Flow data provide information on the characteristics of individual workers who lost their jobs, on those who found employment over the period and, in general, the size and characteristics of the population whose labour force status has changed during a given period.

Data sources

Flow data may be obtained in different ways using specifically designed procedures, for example, retrospective questions in a conventional survey questionnaire or through longitudinal surveys or school-to-work transition surveys. They can also be derived by exploiting the rotation sampling schemes incorporated in surveys designed to obtain stock data or by matching census files or administrative registers at individual levels or at higher aggregated levels to construct synthetic cohorts.

Retrospective questions

A retrospective question concerns a specific date in the past, for example, the activity status of the individual a year ago, or it may concern an event in the past, such as "when were you last employed?" in the case of a currently unemployed or inactive person.

The first type of retrospective question may be used to construct flow data, such as the number of currently employed persons who were also employed a year ago, or the number who were unemployed or inactive a year ago. Although convenient and relatively inexpensive, the derivation of labour force flow data from retrospective questions has a number of limitations.

First, there may be errors due to memory lapses. Another problem is the difficulty of maintaining the same definition of activity status when referring to the past status as compared to the current one. Generally, determination of the current activity status of an individual as employed, unemployed or inactive is based on the responses to a sequence of structured questions (often involving 10–12 different questions). It is clearly not feasible to reproduce the same set of questions to determine the activity status of the person in the distant past.

A further difficulty with retrospective questions is the problem of disaggregation. For example, disaggregated measurement of movements from part-time to full-time employment or vice versa would require more refined retrospective questions, thus aggravating recall and other errors.

Longitudinal surveys

Longitudinal (or panel) surveys are specifically designed to study the behaviour of specific social groups over time. In a longitudinal survey, a panel of households or individuals are selected and followed through time, collecting relevant statistical information at regular or irregular time intervals.

Longitudinal surveys generally permit a more accurate measurement of flows than retrospective questions. They also provide more flexibility in the choice of variables for behavioural studies of employment and unemployment movements, and allow measurement of long-term as well as shorter-term flows.

These surveys, however, are expensive and require well-developed statistical and administrative infrastructure and data processing capability. There are also difficulties with low response rates (refusals), follow-up of households that changed residence (attrition) or newly formed households (split-offs). Longitudinal surveys are also unsuitable for obtaining timely national flow data on a regular basis.

Matched files

It is also possible to derive flow data by matching records of successive population censuses or records of administrative files referring to the same unit at different points in time. The matching may be done at individual or aggregate level, using an exact or statistical matching procedure.

Matching population census files is a complex process and the results should be interpreted with care since the data do not account for any flow that may have occurred between the successive census dates. Accordingly, the method may be more meaningful for deriving flow data on variables that are relatively stable over time, such as movements between occupations.

Matching records of administrative files is a more efficient method of deriving flow data. In these instances, several administrative registers are linked to each other (e.g. the records of the public employment service, social insurance, tax administration and so on). By using the unique "individual number" as an identifier, it is possible to ascertain the labour force status and key characteristics of each person at selected points in time, and thus produce corresponding flow statistics for the population covered.

Particular types of flow statistics may also be derived from establishment surveys (labour turnover, hiring and firing), unemployment insurance registers (gross movements of insured workers into and out of unemployment), and a variety of other sources such as employment exchange records and vacancy statistics. In certain cases, registers and surveys may be combined to construct integrated sets of flow statistics.

Register-based flow data are less costly to collect, allow detailed geographical and individual disaggregation – useful for deriving flow data on small areas or between occupations and branches of economic activity – and are also generally less prone to measurement errors.

The main disadvantage is the difficulty of adapting concepts and definitions of administrative systems to statistical needs. Changes in administrative systems, as well as in regulations and procedures, may affect statistics and lead to overstatement of true flows. Another problem concerns the confidentiality of individual records, which may limit the matching of different registers.

Synthetic cohorts

This method uses repeated cross-sectional labour force data to construct artificial cohorts for estimating transition probabilities and expected durations in different labour force statuses. The idea is that survey results from retrospective questions contain flow information, which can be used to artificially construct the labour force experience of cohorts of individuals through time. For instance, in a quarterly labour force survey unemployed persons reporting more than three months of unemployment in the current quarter must have been unemployed in the prior quarter. Thus, the number of persons unemployed for more than three months as a proportion of those newly unemployed in the last round of the survey provides an estimate of the probability of remaining unemployed in two successive quarters.

The same principle can be used to calculate probabilities of remaining employed in successive periods and estimates of expected duration of completed spells of employment of young people.

Rotation samples of regular surveys

Flow data may also be obtained by exploiting the rotation sampling schemes of labour force surveys, when available.

In a rotation scheme, the sampling units at successive survey rounds are partially retained according to a prescribed pattern. For instance, in a quarterly survey with a 2-2-2 rotation pattern, sample households are retained in the sample for two successive quarters, kept out of the sample in the next two quarters, and returned back to the sample in the subsequent two quarters before leaving the sample indefinitely.

In such sample designs, a fraction of sample households and persons remain in the sample at different points in time and therefore provide the basis to derive flow data by matching records from successive survey rounds.

Flow data from rotation samples have a number of advantages. First, because they are derived from labour force surveys, the concepts and definitions are in line with statistical requirements, and the concepts and definitions of the flow data correspond to the concepts and definitions of the stock data. Also, the data are not subject to recall errors as in the case of retrospective questions. Furthermore, the cost and organization demand of the rotation method are lower than would be required for longitudinal surveys.

The rotation method, however, is not suitable for deriving long-term flow data and involves a number of measurement and processing issues that need special attention. These include the possibility of rotation-group bias and the possible inconsistency of the stock estimates derived from flow data and the corresponding national labour force estimates.

Specially designed surveys

Finally, dynamic data on youth labour force may be obtained through specially designed surveys in which survey respondents are asked to report on their labour force experience, using retrospective questions or a combination of other questions, as with the ILO school-to-work transition surveys.

Youth labour force flows

The analysis of labour market dynamics based on flow data can be described in terms of a transition matrix recording the flow between different labour force statuses over time. The next example shows the structure of a simple transition matrix. It has three rows listing the basic labour force status (employed, unemployed, inactive) at the original time, and three columns with the labour force status in subsequent periods.

The cells record the number of persons in each of the nine possible combinations of labour force statuses: EE counts the number of persons employed in the original time period who remained employed in the subsequent time period; EU those who were originally employed, but were later unemployed and so on. An example of a compiled labour force transition matrix is given below, showing the flows from the second to third quarter of a given year.

The stock data of the labour force survey (the totals in the table above) show that the number of unemployed increased by 6,000 individuals in the third quarter. Such a change in unemployment was the result of an inflow of 38,000 young people into unemployment (21,000 youth who lost their job and 17,000 who were inactive before) and an outflow of 32,000 individuals (12,000 young persons who found employment and 20,000 who left the labour force).

Labour force transition matrix

			Subsequent time period		
			E	U	N
Original period	Employed	E	EE	EU	EN
	Unemployed	U	UE	UU	UN
	Inactive	N	NE	NU	NN

Youth labour force transition matrix Q2 and Q3 (thousands)

Youth, aged 15–24 years old			Quarter 3			
			E	U	N	T
Quarter 2	Employed	E	375	21	54	450
	Unemployed	U	12	16	20	48
	Inactive	N	83	17	349	449
	TOTAL	T	470	54	423	947

Job gains and job losses

A youth labour force transition matrix also provides information on job gains and job losses. Job gains are calculated by the sum of the number of unemployed persons and the number of inactive persons who found employment in the next quarter. These values are given in the first column of the transition matrix. Thus, the estimate of job gains for youth in the third quarter is:

Youth job gains = 12,000 + 83,000 = 95,000

Similarly, job losses can be estimated from the first row of the transition matrix. Job losses are represented by the number of young persons who were employed in the previous quarter and became unemployed or inactive in the next quarter, e.g.:

Youth job losses = 21,000 + 54,000 = 75,000

The difference between job gains and job losses is the net change in employment (20,000 in the example).

Employment opportunities and unemployment risk

The flow matrices also provide the basis for the calculation of transition rates between labour force statuses. Transition rates describe the probabilities of moving from one labour force status to another in a dynamic labour market. The following table shows the transition rates for the above example, calculated row by row, each cell giving the probability of moving from the labour force status of the respective row to another status.

The cells read diagonally represent the probabilities of remaining in the same labour force category in two consecutive quarters (83.3 per cent of the employed youth population continued to be employed in the next quarter; 33.3 per cent of unemployed youth remained unemployed; and 77.7 per cent of inactive youth remained inactive). In a sense, these numbers represent the degree of stability of the youth labour market.

The off-diagonal elements show employment opportunities and unemployment risks. The off-diagonal cells in the first column of the matrix represent the employment opportunities. Thus, the employment opportunity for an unemployed youth is 25 per cent, representing the probability of a young unemployed person finding employment in the next quarter. Similarly, the employment opportunity for an inactive youth is 18.5 per cent.

The off-diagonal elements of the second column of the table measure the unemployment risks (4.7 per cent for a young worker and 3.8 per cent for an inactive youth).

The third column of the matrix represents the probabilities that workers and unemployed persons have of leaving the labour force (12 per cent and 41.7 per cent, respectively).

Youth labour force transition rates (%)

YOUTH, AGED 15–24 YEARS OLD			QUARTER 3			
			E	U	N	T
Quarter 2	Employed	E	83.3	4.7	12.0	100.0
	Unemployed	U	25.0	33.3	41.7	100.0
	Inactive	N	18.5	3.8	77.7	100.0

Flows among employment categories

The analysis of labour force dynamics can be extended in two directions: by considering more detailed labour force statuses (e.g. temporary and permanent employment), or by disaggregating the population into groups (e.g. young men and women, youth and adults). Similarly, the flows between paid and self-employment, private and public sector, or between formal and informal employment can be examined.

An example that distinguishes between temporary and permanent employment, for men and women by broad age categories is shown below. The table shows the employment opportunities and unemployment risks of the different population categories and labour force statuses.

Employment opportunities by sex and age group (%)

	UNEMPLOYED		INACTIVE		TEMPORARY
	Permanent employment	Temporary employment	Permanent employment	Temporary employment	Permanent employment
Total	4.5	20.0	1.2	7.3	9.1
Men	4.9	17.8	1.5	7.1	10.2
Women	3.9	22.8	1.1	7.5	8.4
15–24 years	5.5	27.0	1.7	12.5	7.4
25–54 years	4.8	20.0	1.6	6.5	10.7
55–64 years	1.7	9.9	0.1	1.1	6.4

The first row of the table shows that an unemployed person has greater opportunities to obtain temporary work (20 per cent) rather than a permanent job (4.5 per cent). For a temporary worker, the likelihood of obtaining a permanent job is 9.1 per cent. The next two rows show that men have more opportunities compared to women.

As regards age group, the figures show that unemployed and inactive young people have greater employment opportunities than adults, whether for permanent or temporary employment. However, young people in temporary employment have lower opportunities to obtain permanent employment, than adults with the same type of employment.

Expected unemployment duration

Another use of flow data is the calculation of expected duration of completed spells of unemployment or other types of labour force experience. The basic result is that under steady conditions, duration is equal to the ratio of stock to flow, for example,

$$\textit{Expected unemployment duration} = \frac{54{,}000}{38{,}000} = \textit{1.4 quarters (4.3 months)}$$

Thus, the expected duration of completed spells of the newly unemployed can be estimated by the ratio of the number of unemployed at the given time divided by the number of newly unemployed during a particular period.

The data of the youth labour force transition matrix presented above show that the expected duration of unemployment of the newly young unemployed in the third quarter is:

$$\textit{Expected unemployment duration} = \frac{470{,}000}{95{,}000} = \textit{4.9 quarters (15 months)}$$

Similarly, one can calculate the expected duration of employment of a newly employed young person before the next spell of unemployment or inactivity.

Flows from school-to-work

Flow matrices similar to those of labour force flows can be constructed for young people using an expanded labour force variable describing the joint school and labour force status of the individual with four categories: E = Employed; U = Unemployed; S = Inactive, at school; O = Inactive, not at school. The resulting flow matrix can be used to estimate:

- ***The number of school leavers;***
- ***The proportion of school leavers entering the labour market;***
- ***The likelihood of obtaining employment without any spell of unemployment;***
- ***Expected duration of employment before first spell of unemployment; and***
- ***The expected duration of unemployment of school leavers entering the labour market.***

The analysis could also be carried out for men and women separately, as well as by age group, educational attainment and other characteristics of interest. The analysis can also be refined by splitting the employment category (E) into informal employment (IE) and formal employment (FE), and therefore measuring the extent of smooth transitions of school leavers into the labour market, through the following indicators:

- ***Proportion of school leavers obtaining formal employment immediately after school; or***
- ***Expected waiting time to formal employment after leaving school.***

Measuring the transition of youth from school to work

Country C has recently introduced a panel design to its quarterly Labour Force Survey. The data on youth (aged 15–29 years old) enable exploration of flows among labour market statuses and from school to work. The basic matrix (thousands of individuals) is reproduced below.

School-to-work flows (aged 15–29 years old)			Quarter 2				
			E_t	U_t	S_t	O_t	Total
Quarter 1	Employed	E_{t-1}	380	22	8	19	429
	Unemployed	U_{t-1}	19	201	0	3	223
	Inactive, at school	S_{t-1}	8	19	611	17	655
	Inactive, not at school	O_{t-1}	12	5	56	141	214
	Total		419	247	675	180	1 521

On the basis of the above matrix, calculate:

- the number of school leavers;
- the proportion of school leavers entering the labour market;
- the likelihood of obtaining employment without any spell of unemployment;
- the expected duration of unemployment;
- the expected duration of employment before first spell of unemployment; and
- the job gains and job losses.

Suggested answer

The first step is to transform the levels of the matrix into percentages:

School-to-work flows (aged 15–29 years old)			Quarter 2				
			E_t	U_t	S_t	O_t	Total
Quarter 1	Employed	E_{t-1}	88.6%	5.1%	1.9%	4.4%	100.0%
	Unemployed	U_{t-1}	8.5%	90.2%	0.0%	1.3%	100.0%
	Inactive, at school	S_{t-1}	1.2%	2.9%	93.3%	2.6%	100.0%
	Inactive, not at school	O_{t-1}	5.6%	2.3%	26.2%	65.9%	100.0%

The number of school leavers in October was 44,000 young persons. This comprises 8,000 who left school and became employed, 19,000 who became unemployed and 17,000 who remained inactive but were no longer at school. The share of school leavers is 6.7 per cent.

The proportion of school leavers entering the labour market is 4.1 per cent (or 27,000 young people).

The likelihood of obtaining employment without any unemployment spell for school leavers is 1.2 per cent.

The expected unemployment duration is given by the stock of unemployed (247,000) divided by the newly entered unemployed (22,000 who lost their job, 19,000 who were at school and 5,000 who were inactive and not in school). The result is 5.3 quarters, while the expected duration of employment before unemployment is 10.7 quarters.

Job gains are 39,000 (19,000+8,000+12,000) and job losses 49,000 (22,000+8,000+19,000).

Young workers are more likely to shift to inactivity than employment (6.3 per cent and 5.1 per cent), while the unemployed are more likely to shift to employment than inactivity (8–5 per cent and 1–3 per cent). The inactive are slightly more likely to shift to employment (6.8 per cent) than unemployment (5.2 per cent).

Glossary

Flow data
Flow data are generated from retrospective questions in labour force surveys, LFS panel design, longitudinal surveys, matched administrative records or synthetic cohorts, and measure labour force changes occurring at the level of individual workers over time.

Flow matrix
A flow matrix visually organizes labour market data to understand changes in key labour status variables (inactivity, employment, unemployment).

Synthetic cohort
A synthetic cohort is a "hypothetical" cohort comprised of data from actual cohorts that are present, at different ages, in a given year.

Additional reading

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