International Labour Organization

QUICK GUIDE ON SOURCES AND USES OF LABOUR STATISTICS

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1. Introduction

The term *statistics* comes from the German "*statistic*" which referred to the science dealing with facts of a state and derived from the New Latin "*statisticus*" ("concerning state affairs") and from the Latin "*status*" ("state").[1] Thus, statistics were originally intended for government use and to provide data on the state territory and characteristics.

Labour statistics are a body of official statistics which deals with work, productive activities, workers, the characteristics of the labour market and the way it operates. They encompass a wide range of topics and link to many other bodies of official statistics, such as economic statistics, education statistics and health statistics, to name a few.

Having timely, valid, reliable, and comparable labour statistics is crucial to inform policy formulation, implementation and evaluation, labour market research and goal setting and monitoring. Such labour statistics can be derived from a number of different types of sources, including population censuses, household surveys and establishment surveys. The quality and meaning of the labour statistics produced depends on the characteristics, strengths and limitations of the source used. To ensure the comparability and robustness of labour statistics, the methodology used to produce them should ideally follow international standards.

The production of labour statistics is never a goal in itself, but it is always a means to an end (or more accurately, various ends). The true value of labour statistics lies in the analysis and interpretation made of them, and their ability to support evidence-based decision and policy-making.

This guide provides an overview of the main characteristics of labour statistics, their scope and uses. It also describes the types of sources of labour statistics available, indicating the main advantages and disadvantages of each source, before moving on to introducing the international standards underlying labour statistics. The guide also seeks to demonstrate the importance of labour statistics in terms of their analytical potential. Although the guide is not exhaustive and does not thoroughly describe each possible specific source of labour statistics and every eventual use of labour statistics, it serves as an introductory tool to the field of labour statistics. It is addressed to people wishing to gain a basic understanding of labour statistics so as to apply this in their work or to better grasp labour market developments. This includes researchers, journalists, students of various subjects, data users in general and anyone who is eager to learn about the labour market.

2. What are labour statistics?

Labour statistics are a very relevant and necessary body of official statistics focusing on the productive activities of workers and eventually deficiencies of the labour

[1] Collins English Dictionary, available at: https://www.collinsdictionary.com/dictionary/english

market, from many perspectives and covering many dimensions. The following sections explore in detail these main characteristics of labour statistics, namely their place in official statistics, their reference to productive activities, their multidimensional nature, and their scope.

2.1. Labour statistics are official statistics

As mentioned in the introduction, the link between statistics and the government (state) is embedded even in the etymology of the word *statistics*, that is, their official nature is at the heart of their very definition. This is no different for labour statistics.

Official labour statistics are generally produced by the institution in charge of statistics in a country. This is usually a separate agency: the national statistical office or institute, but it could also be a unit of another agency (a related ministry, for instance). In particular for labour statistics, the labour ministry could be in charge of the compilation and dissemination of data where a national statistical office does not exist or does not have the relevant mandate or resources.

The institution in charge of labour statistics should be part of the government so as to ensure the production and dissemination of statistics as a public interest, to inform policy makers as well as the general public, instead of pursuing private interests (as is the case of private companies producing statistics for their own purposes).

However, in spite of being part of the government, the institution in charge of statistics should be independent from the government. Full autonomy is necessary to ensure the robustness of the methodologies used and the reliability of the figures, untarnished by political or other concerns.[2]

The national statistical system includes many different bodies of statistics in addition to labour statistics, such as national accounts, industrial production statistics, agricultural statistics, demographic statistics, education statistics, and health statistics. Ideally, all of these bodies of statistics would be linked together and consolidated through the use of consistent methods.

2.2. Labour statistics refer to productive activities

Labour statistics refer to the productive activities of workers, and the labour market deficiencies associated with them. Work comprises any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use[3], and labour statistics potentially cover all forms of work. This includes work

[2] For further information on the main principles guiding the production and dissemination of official statistics, refer to the Resolution adopted by the United Nations General Assembly on 29 January 2014, on Fundamental Principles of Official Statistics, available at https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

[3] As defined in the Resolution concerning statistics of work, employment and labour underutilization, adopted by the Nineteenth International Conference of Labour Statisticians (October 2013), available at http://ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm

for pay or profit for use by others (employment), work not for pay or profit for use by others (unpaid trainee work, volunteer work, and other work activities) and work for own final use (own-use production work).

The need to produce statistics on forms of work other than employment has been recently recognized officially, with the first definitions for these other forms of work incorporated in the 2013 *Resolution concerning statistics of work, employment and labour underutilization.*[4] Thus, labour statistics around the world focus mainly on employment (as opposed to other forms of work).

Labour statistics also seek to provide a comprehensive picture of the labour market, informing on both the supply side and the demand side. Statistics on labour supply refer to data on the population (actually or potentially) providing the labour input needed in the economy, that is, data on the employed, the unemployed and persons outside the labour force (which together represent the whole population, or the working-age population in cases where a lower or upper age limit is used), as well as on their specific characteristics (sex, age, economic activity, occupation, educational level, etc.). Statistics on labour demand refer to the users and uses of the labour input, that is, data on the enterprises creating employment, vacancies, jobs, productivity, etc.

2.3. Labour statistics are multidimensional

In addition to covering productive activities from various perspectives (labour supply and labour demand, work for pay and profit or not, work for use by others or not), labour statistics also include data on multiple dimensions.

The various aspects and issues of the labour market covered by labour statistics span across disciplines such as demography (ratio of working-age-population to total population, ratio of youth to adults, ratio of seniors to adults, etc.), economics (productivity, wages, unemployment, etc.) and social studies (labour market performance according to sex, age, educational level, etc.). Labour statistics are also closely connected to other statistical areas such as statistics on household income and expenditure and the consumer price index, since these allow for the assessment of household living conditions and minimum wage setting, part and parcel of the world of work.

Labour statistics also provide tools to study labour markets both at the micro and macro levels. They allow us to investigate and understand decisions, behaviours and labour market performance of individuals and enterprises (microeconomic perspective), as well as the labour market performance of the country as a whole (macroeconomic perspective).

[4] The full text of the resolution is available at http://www.ilo.ch/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_230304/lang--en/index.htm

Naturally, all of this can (and should) be studied over time, so as to assess fluctuations. The analysis of short-term and long-term trends is another key part of labour statistics.

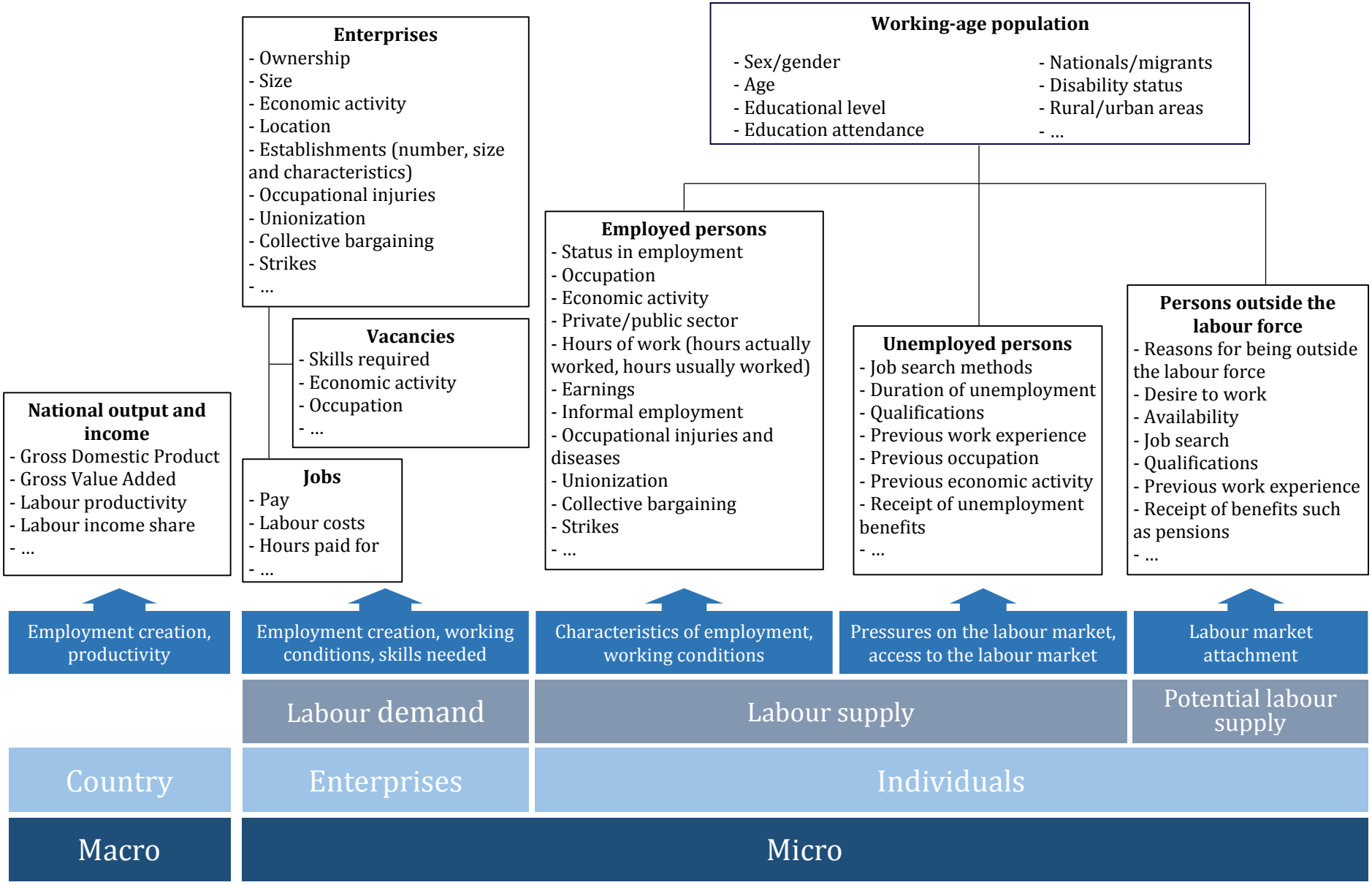
Thus, labour statistics present the variety of measures needed to potentially convey a comprehensive picture of the labour market, covering demographic and socioeconomic aspects, the labour market performance of individuals, businesses and the economy as a whole, the characteristics of labour supply and labour demand, all forms of work and all types of productive activities, and providing the means to study their evolution.

2.4. Scope of labour statistics

As stated above, labour statistics focus on a wide range of labour markets issues and their variations over time, which means that the scope of labour statistics is vast. Labour statistics refer both to labour demand and supply. Statistics about labour demand include data on the number and characteristics of enterprises, jobs, and vacancies as well as the costs of hiring. Statistics about labour supply deal with the working-age population, presenting data on its size, structure and characteristics, and more specifically, information on employment, unemployment, and persons outside the labour force. Some of the main characteristics of jobs and employment covered by labour statistics include earnings, working time, economic activity, occupation, status in employment, establishment size, private/public sector, formal/informal sector, social dialogue, occupational injuries, and social security coverage.[5] The figure below summarizes the items within the scope of labour statistics.

[5] For more information, check the ILO webpage on Overview and topics of labour statistics, at http://ilo.org/global/statistics-and-databases/statistics-overview-and-topics/lang--en/index.htm

Figure 1. The scope of labour statistics



2.5. Labour statistics and decent work

As discussed in the previous sections, labour statistics cover many different aspects of the world of work, referring to labour supply and demand, and casting light not only on the quantity of employment but also on its quality. Quality of employment pertains to the various dimensions of working conditions, including earnings, working time, status in employment, sector of employment (formal or informal), collective bargaining coverage, and unionization, to name a few.

This is closely related to the concept of "decent work"[6], which represents the ideal of enough freely-chosen, quality jobs for all men and women who wish to work. Decent work stands on four main pillars: employment creation, rights at work, social protection coverage and social dialogue, with gender equality underlying all of them, with a view to achieving sustainable, inclusive economic growth, and eliminating poverty.

In order to monitor progress made towards the achievement of decent work for all, a Decent Work Indicators Framework was designed, comprising both statistical and legal framework indicators, and covering numerous areas of the world of work.[7]

2.6. Labour statistics and the Sustainable Development Goals

Similarly, labour statistics are also embedded in the Sustainable Development Goals (SDGs), primarily (but not solely) through Goal 8 - Promote inclusive and sustainable economic growth, employment and decent work for all. The SDGs are an encompassing tool and action plan designed and adopted by the international community to achieve sustainable development throughout the world by 2030.[8]

In this regard, a global indicator framework has been created to measure progress made towards the accomplishment of the SDGs, comprising over 230 indicators on a wide array of topics, including various labour and decent work indicators.[9]

3. What are labour statistics for?

Healthy labour markets generating decent and productive employment opportunities are at the heart of the quest for inclusive economic growth and development. Labour statistics are a valuable means to understanding labour markets. They can potentially provide a wealth of information on the way labour markets work, their strengths and shortcomings, and the trends observed and expected.

[6] For more information on the concept of Decent Work and the ILO's Decent Work Agenda, refer to http://www.ilo.org/global/topics/decent-work/lang--en/index.htm

[7] For further information refer to the ILO manual *Decent Work Indicators - Guidelines for producers and users of statistical and legal framework indicators*, available at http://www.ilo.org/stat/Publications/WCMS_223121/lang--en/index.htm

[8] For more information on the Sustainable Development Goals (SDGs) and the 2030 Agenda for Sustainable Development, refer to http://www.un.org/sustainabledevelopment/#

[9] For more information on the SDG indicators, refer to https://unstats.un.org/sdgs/indicators/indicators-list/

Labour statistics are key for macro-economic monitoring. They inform on the economy's performance and the impact in terms of employment generation of economic policies.

They allow for the identification of issues within labour markets, and support the formulation and implementation of policies and programmes to promote Decent Work, as well as the evaluation of their subsequent results. They are also the basis for goal setting in terms of labour market performance and for monitoring progress towards the attainment of such goals.

Labour statistics play an important role in the communication between policy-makers and decision-makers and the general public, since they promote the understanding of common labour market problems and the actions undertaken to address them, thus also contributing to engagement between the general public and policy-makers.

More specifically, labour statistics have a significant part to play in the achievement of decent work for all, by informing on the formulation, implementation and evaluation of policies and programmes for job creation, appropriate working conditions, sound industrial relations, work-life balance, and assistance for vulnerable groups.

4. How are labour statistics produced?

Labour statistics comprise statistics from a wide range of labour-related topics and can be derived from a variety of sources. The characteristics of the statistical source determine how reliable, comparable and representative labour statistics and labour indicators (summary measures representing labour statistics related to a specific topic) are. Hence, when referring to labour statistics, it is crucial to understand the implications of the type of source used and to keep in mind its methodology and coverage (geographical, population, topics, etc.) of the underlying source.

The more traditional sources of labour statistics are population and establishment censuses, and household and establishment surveys, because these are purposely designed to produce statistics. However, a wealth of valuable information can also be derived from sources not initially created for statistical purposes, such as administrative records and big data.

In any given country, there are typically various sources of official statistics available. A very developed and integrated system of statistics will involve production of statistics from all the above-mentioned sources (with the exception perhaps of big data, which has not yet been widely incorporated into official statistics). National statistical offices are generally at the core of the national system of official statistics, usually designing and conducting data collection activities for the purpose of producing statistics (censuses and surveys), deriving statistics from information available to other agencies (records kept by other agencies), and coordinating statistical efforts of the various agencies with some statistical capacity. Regarding labour market statistics specifically, the other agencies involved in data production (and often also in dissemination) include labour ministries, social security institutions and employment offices.

The following sections give an overview of the main strengths and limitations of each of the main sources of labour statistics. A synoptic table with summary information on the main sources of labour statistics is provided in annex.

4.1. Population census

The population census is a key source of information on the population, usually acting as the basis for a country's official statistics on households and individuals. It is an exhaustive exercise, with universal coverage: all households in a country are contacted in the data collection phase and information on all household members is gathered. Thanks to this, it can serve as sample frame later on for sample surveys. Its universal coverage and high representativeness allow for the study of small population groups and geographical areas.

Nevertheless, because it is such an exhaustive collection, a population census is very costly and is thus usually conducted infrequently. Generally, countries conduct population censuses every 10 years.[10] Also, a population census tends to collect general information only, not going into detail for specific topics such as labour, which adversely affects the quality of the labour statistics obtained from this source.

4.2. Household surveys (including labour force surveys)

One way of overcoming the high cost of population censuses, and enabling the use of longer questionnaires to gather more in-depth information, is selecting a sample of the whole population in the census to conduct a survey. Sample survey questionnaires are typically longer, and designed specifically to collect data on the desired topics. By their nature, household surveys can cover any topic on which household members provide information. They are cheaper than censuses, so they can be more frequent, allowing for the study of short-term trends. Due to the fact that they cover all individuals in the sampled households, regardless of their labour market status, their occupation, the type of establishment they work for, etc., household surveys provide a consistent framework to simultaneously study employment, unemployment and persons outside the labour force, with many interesting disaggregations. This also means that household surveys cover workers in the informal sector and/or in informal employment, given that individuals within the sample are interviewed irrespective of the characteristics of their employment (as opposed to establishment surveys, which tend to exclude informal sector enterprises and informal employment, as discussed below).

However, household surveys entail sampling errors, potentially hindering the quality of the results. In particular, estimates for small groups or areas might have limited reliability due to their low coverage in the sample. Moreover, the reliability of the results is highly dependent on the accuracy of the respondents, who might tend to overstate or understate

[10] As recommended by the United Nations Statistics Division. Detailed information on when countries around the world conducted population censuses can be found at https://unstats.un.org/unsd/demographic/sources/census/censusdates.htm

some particular answers. The use of proxy respondents (one household member providing the required information on all the members of his or her household) may also hinder the accuracy of the answers given to the survey questionnaire.

Labour force surveys are the main type of household surveys used to derive labour statistics, since they are designed specifically for that purpose, and thus, the survey questionnaires allow to properly investigate the desired labour-related topics with enough probing questions to ensure the accuracy of the results. However, other household surveys, such as household income and expenditure surveys or time-use surveys, can be used as well, provided they include a corresponding labour module.

4.3. Establishment census and surveys

In population censuses and household surveys, the sampling unit is the household, but statistics can also be collected using the establishment as a sampling unit, particularly regarding income, working time and employees – that is, topics on which the establishment or employer holds information. In general, surveying establishments is less expensive and more cost-effective than surveying households. Here too, there is the possibility of an exhaustive exercise covering all establishments in a country (establishment census) or of a collection focusing only on a representative sample of establishments (establishment survey). Naturally, establishment censuses are more costly and are typically conducted less frequently than establishment surveys, but they are more representative.

It is crucial to note that informal sector establishments and small establishments are rarely covered, and depending on the national context, these might represent a considerable share of the labour market. Likewise, establishment censuses and surveys cover only employees, thus excluding the self-employed (employers, own-account workers, contributing family workers, etc.).

4.4. Administrative records

Administrative records are utilised for administrative purposes such as keeping a record of the members, activities, staff, etc. of the corresponding agency or institution. They were not designed for statistical purposes, but they do have a significant underlying statistical potential, and can be used to produce statistics as a by-product. They are particularly useful in contexts where there are no regular household or establishment surveys in place, to serve as an alternative source of statistics.

In any given country, the administrative records found are numerous and varied, and cover a wide range of topics. Some examples are population registers (population data), records of tax authorities (income data), registration of students in the educational system (education data) and medical registration (health statistics). When it comes to labour statistics, the main administrative records used are records of employment offices or unemployment benefits (data on registered unemployment), records of workers' organizations (data on unionization, strikes, etc.), collective agreements (data on

collective bargaining, wages, etc.) and labour inspection records (data on occupational accidents).

Administrative records are a very inexpensive source of statistics, since they are created and maintained by the corresponding agency and information is readily available, which means that no further compilation effort is needed. By their nature, administrative records usually have an exhaustive coverage of all the units in their reference universe.

However, given that the records were created for administrative purposes and not statistical ones, they have to undergo some statistical processes for the data to actually become reliable statistics, including the study of definitions, concepts and classifications used, editing the data to correct any inconsistencies found, coding variables and creating new ones if need be, and deciding on the imputation method to apply for the treatment of missing data.

Depending on the incentives and rules associated with the registration process (for instance whether filling in the administrative form is mandatory or not, or whether any benefit is subject to the registration in the record), the resulting administrative data will be more or less affected by issues of miss-counting, double-counting or under-reporting. Whenever these issues are known or suspected to be significant, thorough procedures should be put in place to correct the data before presenting it as valid.

Also, the topics covered and the units used will depend solely on the administrative processes at the root of the creation of the record, and these are not necessarily the ones data users need statistics on (as opposed to statistics derived from compilations designed specifically for statistical purposes, where the topics covered, units used and variables produced are typically the ones desired by data users).

4.5. National accounts

National accounts are a complete, integrated set of accounts created for the purposes of measuring an economy's performance. They usually comprise production, income, expenditure accounts, capital accounts, financial accounts and balance sheets, and they include information on both flows and stocks. The agencies responsible for their compilation and maintenance are most commonly national statistical offices or central banks, but this may differ from country to country.

National accounts are a key source of statistics on macroeconomic indicators, providing accurate measures of a country's aggregate economic activity given that they tend to cover the activities of all economic actors (households, enterprises and the public sector). Perhaps the most notable indicator derived from the national accounts is GDP (Gross Domestic Product), but they allow for the calculation of many other useful measures, such as the labour income share, exports and imports, the government deficit, households' final consumption expenditure and even employment (which typically differs from employment estimates derived from household surveys).

The quality of the data in national accounts heavily depends on the robustness of the accounting and recording methods used, and the methodological consistency across the various sources of information brought together in the accounts. Among the main drawbacks of national accounts are the difficulties to measure the production of intangible goods, and the exclusion of unpaid work (not comprised in the calculation of the GDP or in any account). These issues may be more or less significant depending on the national context.

When using data from national accounts, it is paramount to verify whether the information is presented in nominal or real terms (that is, in current prices or adjusted for inflation), especially when the intention is to calculate growth rates (such as the GDP growth rate).

Even though the detailed structure and organization of national accounts may vary from one country to another, the main components tend to be very similar across countries. The UN System of National Accounts (SNA) represents the internationally-agreed standard on the compilation and dissemination of aggregate economic measures from national accounts.[11]

4.6. Big data

With the advent of technology, mobile devices and ubiquitous internet access, data sets are growing exponentially both in number and size, with practically every online transaction and search being recorded. Big data refers to all data sets that are too big to be analysed using traditional data processing and statistical methods.

Big data can supply a wealth of information on labour statistics, for instance on job searches, vacancies and skills. Even though there are still no internationally-agreed methodologies and guidelines on deriving labour statistics from big data, it is rapidly gaining ground as a statistical source.

Regarding the use of big data as a source of labour statistics, the main challenges are data curation and triage (finding the portion of data that is actually useful for the purposes at hand among the enormity of data available), establishing the appropriate concepts and definitions and the coverage of the statistics (restricted to persons with Internet access, or having the means to carry out transactions online, etc.).

4.7. Other sources

In the absence of a recent household or establishment survey coupled with a lack of official procedures to produce reliable statistics from administrative records, other sources and methods can provide some insight into the labour market. In particular, the information available, knowledge on the national context and some conscious assumptions can be used to derive estimated, imputed or modelled labour market data.

[11] For more information on the UN System of National Accounts (SNA), please refer to https://unstats.un.org/unsd/nationalaccount/sna.asp

The methods used for estimation and imputation must be robust in order to ensure data quality and the reliability of the results, just as any model used to derive labour statistics should be thoroughly tested and reviewed.

With a view to meeting the needs in terms of labour statistics of various data users (both in-house and external), the ILO regularly produces model-based estimates and projections of labour market indicators. This long-standing effort by the ILO to produce consistent and comparable data on the main labour indicators through the use of econometric models provides both country-level estimates and regional and world aggregates. Among the main ILO econometric models are the Labour Force Estimates and Projections Model (estimates of the labour force and labour force participation rates), the Global Employment Trends Model (estimates of unemployment, employment-to-population ratios, status in employment, employment by sector, employment by occupation and labour productivity) and the Employment by Class Model (estimates of working poor and working poverty rates and the distribution of the employed across economic classes).[12] The ILO has also developed models to derive global and regional estimates for other specific topics related to the labour market, such as wages, social protection coverage, child labour and forced labour, and continuously works to expand the topics covered by its modelled data production efforts.

4.8. Consolidated labour market information systems

As explained in the previous sections, each type of source has its advantages, disadvantages and specificities. No single data source can meet all needs, but rather, the different source types are complementary. All the main sources mentioned should contribute to an overall integrated system of national labour statistics. By recognizing the relative strengths, limitations and complementarities of the various types of sources available, the spectrum of labour statistics becomes wider and more robust.

There are numerous ways in which different source types can complement and enrich each other. For instance, census data can be used for benchmarking and to develop sample frames for surveys, as well as population or business registers. Also, survey data can provide between-census estimates and be used to monitor short-term trends. Furthermore, administrative data can complement survey and census data, and at the same time, survey data can help to offset the problem of under-registration in administrative records.

However, for this to be possible (that is, to have an integrated statistical system of labour market information reconciling the various source types available), it is necessary to ensure the coherence between sources in terms of the methodological guidelines used (concepts, definitions, classifications, reference periods, etc.). Ideally, this coherence

[12] For more detailed information on the ILO's estimates and projections of labour market indicators, see http://www.ilo.org/empelm/projects/WCMS_114246/lang--en/index.htm and http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_216451.pdf

would be obtained by all sources adhering to the relevant international standards on labour statistics.

5. What are the international standards for labour statistics?

International standards on labour statistics are crucial to ensure the validity, consistency, accuracy, reliability, timeliness and comparability of labour statistics produced around the world. There are two main types of internationally-agreed standards on labour statistics: Conventions and Recommendations adopted by the International Labour Conference (ILC[13]) and Resolutions and Guidelines adopted by the International Conference of Labour Statisticians (ICLS[14]). The ILO, and in particular its Department of Statistics, is the reference at the international level for standards on the compilation and dissemination of labour statistics.

5.1. The ILO Department of Statistics

Acknowledging the essential role played by labour statistics in the ILO's efforts to accomplish its mandate and achieve decent work for all, a statistical unit was created within the ILO since its very inception. This statistical unit (the Department of Statistics[15]) represents the core of ILO statistical expertise and activities, by being the focal point within the ILO for all statistical matters. The ILO Department of Statistics is also the focal point within the United Nations system for labour statistics.

One of the main activities of the ILO Department of Statistics is the compilation and dissemination of labour statistics, covering numerous labour-related topics, and ensuring the relevancy, accuracy, reliability, timeliness and comparability of the data. The Department's aim is to provide both internal (ILO) and external data users (students, researchers, journalists, policy-makers, etc.) with the labour statistics they require. This is accomplished in the ILO Department of Statistics' online database, ILOSTAT[16], which puts at the public's disposal a very comprehensive set of labour-related indicators with long time-series and country-level data, as well as global and regional aggregates for a number of key labour market indicators.

The ILO Department of Statistics is also a key actor in the process of setting international standards of labour statistics to promote the improved measurement of labour issues and enhance international comparability (see section 5.3 below).

Another major activity of the Department of Statistics is providing technical assistance and training in labour statistics to ILO constituents, to foster the development of national statistical systems and labour market information systems in particular.[17]

[13] http://www.ilo.org/ilc
[14] http://www.ilo.org/icls
[15] http://www.ilo.org/stat/
[16] ILOSTAT, the ILO's central online database on labour statistics is available at www.ilo.org/ilostat
[17] For more detailed information on the ILO Department of Statistics' mandate and activities, check its webpage at http://ilo.org/stat/lang--en/index.htm

5.2. Conventions and Recommendations of the International Labour Conference

Conventions and Recommendations adopted by the International Labour Conference are legal instruments that set international labour standards. They are drafted by ILO constituents (governments, employers and workers of all member states) and are adopted at the ILO's annual ILC to establish basic principles and rights at work and to promote sound labour markets. ILC conventions and recommendations are part of the international labour code.

Conventions are legally binding and may be ratified by member states, while recommendations are non-binding guidelines and thus do not require ratification. ILO member States are required under the ILO Constitution to submit labour standards adopted by the ILC to the national competent authority for consideration (consideration for ratification in the case of conventions). Countries having ratified a convention are expected to apply it in national law and practice and report regularly on its application to the ILO.[18] In terms of labour statistics, the existing legal instruments adopted by the ILC are the Labour Statistics Convention (convention n°160)[19] and the Labour Statistics Recommendation (recommendation n°170)[20], both adopted in 1985.

The Labour Statistics Convention lays out the basic framework for the progressive elaboration of national labour statistics programmes. It covers an array of labour-related topics, including labour force, employment, unemployment, time-related underemployment, earnings, working time, wage structure and distribution, labour cost, consumer price indices, household expenditure, occupational injuries and industrial disputes. Hence, it covers statistics produced from various sources, including population censuses, household surveys, establishment surveys and administrative records. Countries are allowed to ratify selected articles of the convention if they are not ready to ratify it in full (that is to say, they can ratify the parts pertaining to some topics only). Ratifying countries (50 to this day)[21] commit themselves to regularly collecting, compiling and disseminating basic statistics on the relevant topics.

The Labour Statistics Convention of 1985 replaced and expanded the 1938 Convention concerning Statistics of Wages and Hours of Work (convention n° 63).[22]

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[18] For more detailed information on international labour standards, see http://www.ilo.org/global/standards/introduction-to-international-labour-standards/lang--en/index.htm

[19] The full text of the Labour Statistics Convention, 1985 (No. 160) is available at http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312305

[20] The full text of the Labour Statistics Recommendation, 1985 (No. 170) is available at http://www.ilo.org/dyn/normlex/en/f?p=1000:12100:::NO:12100:P12100_INSTRUMENT_ID:312508

[21] The full list of countries having ratified the Labour Statistics Convention, 1985 (No. 160) is available at http://www.ilo.org/dyn/normlex/en/f?p=1000:11300:0::NO:11300:P11300_INSTRUMENT_ID:312305

[22] The full text of the Convention concerning Statistics of Wages and Hours of Work, 1938 (No. 63) is available at http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312208:NO and the list of countries having ratified it is available at http://www.ilo.org/dyn/normlex/en/f?p=1000:11300:0::NO:11300:P11300_INSTRUMENT_ID:312208

The Labour Statistics Recommendation (recommendation n°170) complements the Labour Statistics Convention, by providing specifications on the advisable frequency of data collection and dissemination, the desired data disaggregations and the appropriate national statistical infrastructure needed.

5.3. Resolutions and Guidelines of the International Conference of Labour Statisticians

The International Conference of Labour Statisticians is at the heart of the labour statistics standard-setting process. It is a tripartite meeting (bringing together experts from governments, mostly from national statistical offices, employers' and workers' organizations) has taken place roughly every five years since 1923. It is hosted by the ILO and organized by the ILO Department of Statistics, which also leads all the preparatory work needed before each session. The ICLS makes recommendations on selected topics of labour statistics in the form of resolutions and guidelines, to be approved by the Governing Body of the ILO before becoming part of the set of international standards on labour statistics. The resolutions and guidelines put forward by the ICLS are non-binding instruments seeking to promote international comparability of labour statistics as well as methodological consistency across topics and sources.

In general, resolutions present conceptual frameworks, operational definitions, and evaluation methods to produce and disseminate labour statistics while guidelines provide detailed instructions on very specific items.

There have been resolutions on a vast number of labour market topics and dealing with different sources[23], but they tend to focus more on household surveys, and particularly labour force surveys, as a source of data.

6. How to use and interpret labour statistics effectively?

A paramount point to keep in mind when working with labour statistics, is that statistics are never a goal in themselves, but always a means to facilitate the achievement of goals. That is to say, the collection and compilation of statistics is not done just for the sake of producing statistics, but because the statistics are needed and will be used for various purposes. Although the availability of labour statistics is of course a key issue, and it represents a big challenge to overcome in many contexts, the true value of labour statistics does not lie in their availability but in the use given to them and in the interpretation made of them.

Nevertheless, in order to accurately interpret the labour statistics at hand and avoid misleading conclusions, it is important to have comprehensive information on the underlying methods applied, to be aware of the context to which the statistics pertain,

[23] The list of resolutions adopted by the ICLSs and the full text of each one are available at http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/lang--en/index.htm

and to fully understand the concepts, definitions and units used. The following sections present some of the major aspects to take into consideration when interpreting labour statistics.

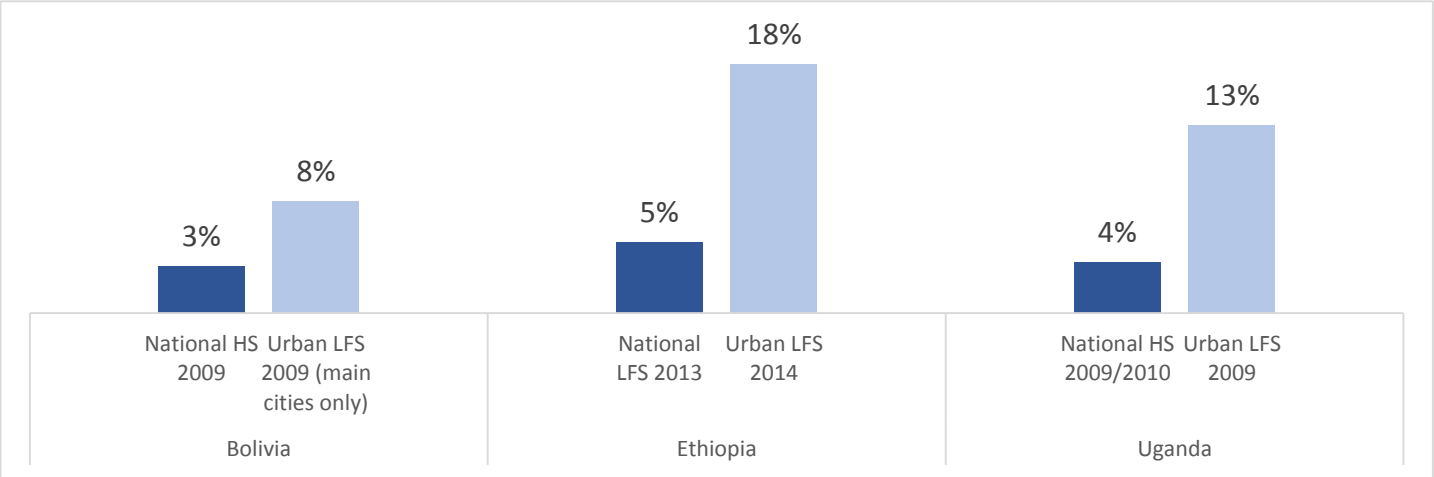
6.1. Scope and meaning of labour statistics determined by their source and methodology

The source and methodology used to derive labour statistics will determine what the statistics actually refer to. More specifically, the coverage of the source (in terms of which geographical areas, population, economic activities, establishments, etc. are covered) will determine the scope of the labour statistics produced. Thus, it is crucial to always analyse labour statistics taking into consideration their coverage, to avoid erroneous interpretations.

Geographic and population coverage of the source

In conducting analysis using labour statistics, special attention should be paid to the geographical coverage of the source used. Rural areas tend to have very different labour market patterns than urban areas, so if the source covers only urban areas or only the main cities, the statistics are unlikely to be representative of the country as a whole. Figure 2 below presents an example of how the geographical coverage of the source impacts the unemployment rates of selected countries. It is clear that in the three countries included in the figure with data from both a national and an urban household survey for the same year or for close years, unemployment rates are considerably higher in urban areas than in rural areas, highlighting the need for clarity about the geographical coverage of the statistics. Having this knowledge is also enlightening for identifying specific labour market issues per area (for instance, it might be interesting for policy-makers to know that while unemployment is an important issue in urban areas, rural areas may be facing other challenges hidden behind low unemployment rates, such as underemployment and informality).

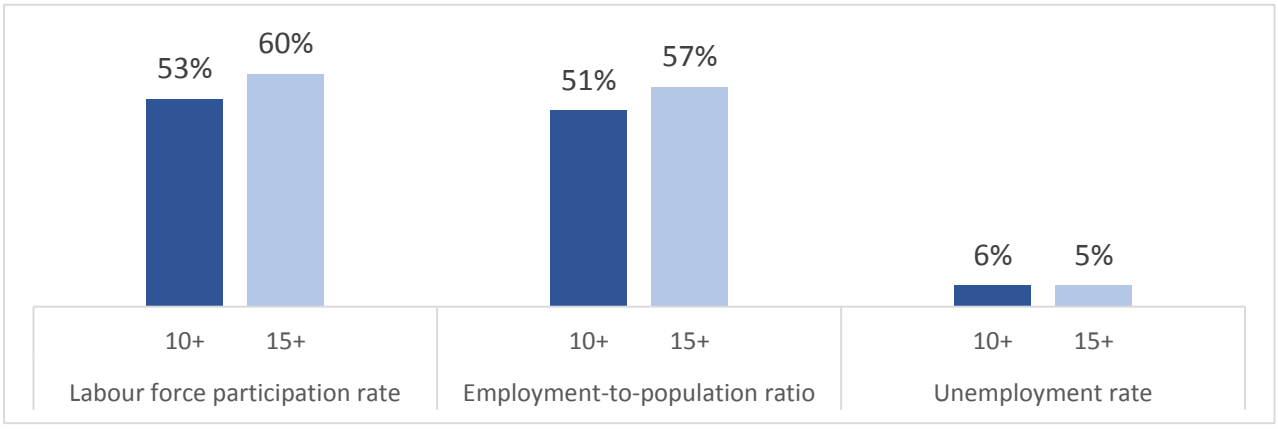
Figure 2. Unemployment rates from national and urban surveys compared, selected countries.



Source: ILOSTAT

Similarly, the population covered by the source will also have an effect on the results. Some statistical sources may exclude some particular population groups from their coverage, and this may affect the representativeness of the statistics. In particular, the age coverage of labour statistics bears great significance, in terms of the age group used to define the working-age population. The usual international practice refers to a working-age population of all persons aged 15 and above, but some countries use different age limits. Figure 3 below shows, as an example, the impact of changing the working-age population from persons aged 15 and above to persons aged 10 and above in three headline labour market indicators for the Dominican Republic.

Figure 3. Headline labour market indicators for ages 10+ and 15+ compared, Dominican Republic, 2016 (annual average).



Source: National Labour Force Survey, National Statistical Office of Dominican Republic

Concepts and definitions used

Naturally, the concepts, definitions and operational criteria used will determine the meaning of the labour statistics produced, and thus, it is crucial to have information on

them when interpreting the results. Table 1 provides an overview of the definitions used to derive several key labour market indicators.[24]

Table 1. Definition and sources for selected labour market indicators.

Indicator	Brief definition	Preferred and/or most common source
Labour force and employment		
Working-age population	All persons in a specified age group for which an inquiry on economic activity is made, commonly persons aged 15 and above.	Labour force survey
Labour force	All persons of working age making up the labour supply, that is, the sum of the employed and the unemployed.	Labour force survey
Labour force participation rate	The labour force expressed as a per cent of the working-age population.	Labour force survey
Employment	All persons of working age engaged in any activity to produce goods or provide services for pay or profit during a short reference period, whether 'at work' or 'not at work' due to temporary absence or working-time arrangements.	Labour force survey
Employment-to-population ratio	Employment expressed as a per cent of the working-age population.	Labour force survey
Vulnerable employment and informality		
Vulnerable employment	Sum of employment in the status of employment groups own-account workers and contributing family workers[25].	Labour force survey
Vulnerable employment rate	Vulnerable employment expressed as a per cent of total employment.	Labour force survey
Informal employment	All persons in employment who are: (a) own-account workers, employers or members of producers' cooperatives employed in their own informal sector enterprises; (b) own-account workers engaged in the production of goods exclusively for own final use by their household; (c) contributing family workers, irrespective of whether they work in formal or informal sector enterprises; or (d) employees holding informal jobs, whether employed by formal sector enterprises, informal sector enterprises, or as paid domestic workers by households.	Labour force survey
Share of informal employment	Informal employment expressed as a per cent of total employment.	Labour force survey
Unemployment and labour underutilization		
Unemployment	All persons of working age not in employment, seeking employment and available to take up employment given a job opportunity, during a specified reference period.	Labour force survey
Unemployment rate	Unemployment expressed as a per cent of the labour force.	Labour force survey

[24] For more detailed definitions of each indicator, please refer to the Metadata section of ILOSTAT (www.ilo.org/ilostat) or the corresponding ICLS resolution (http://www.ilo.org/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/lang--en/index.htm).

[25] Defined according to the International Classification of Status in Employment adopted by the 15th ICLS in 1993, available at http://www.ilo.ch/global/statistics-and-databases/standards-and-guidelines/resolutions-adopted-by-international-conferences-of-labour-statisticians/WCMS_087562/lang--en/index.htm

Indicator	Brief definition	Preferred and/or most common source
Unemployment and labour underutilization (continued)		
Registered unemployment	All persons who are registered as unemployed (or sometimes as job seekers) with the relevant national agency, usually government employment offices, with a view to collecting unemployment benefits, getting help in finding a job or benefiting from public support in general. Thus, this is administrative data highly dependent on the national context (legal framework, requirements for registration, incentives to register, unemployment insurance system, etc.).	Employment office records
Registered unemployment rate	Most commonly, registered unemployment is expressed as a per cent of the labour force, although some countries use a different denominator (employees and unemployed covered by social protection, civilian labour force, etc.).	Employment office records (and labour force survey)
Time-related underemployment	All persons in employment wanting to work additional hours, available to work additional hours given an opportunity for more work and whose working time in all jobs was less than a specified hours threshold, during a short reference period.	Labour force survey
Time-related underemployment rate	Time-related underemployment expressed as a per cent of total employment.	Labour force survey
Involuntary part-time employment	All persons in employment working part-time during the short reference period due to economic slack or because they could not find full-time employment. Part-time employment can be self-declared or defined using a threshold such as 30 hours a week.	Labour force survey
Potential labour force	All persons of working age not in employment and not in unemployment who, during the reference period, either sought employment without being available for employment but expecting to become available in the near future (i.e. unavailable jobseekers) or did not seek employment but wanted employment and were available (i.e. available potential jobseekers).	Labour force survey
Youth not in employment, education or training (NEET)	All young persons (aged 15 to 24 inclusive) not in education, employment or training during the reference period.	Labour force survey
Share of youth not in employment, education or training (NEET rate)	Youth not in employment, education or training (NEET) expressed as a per cent of the total youth.	Labour force survey

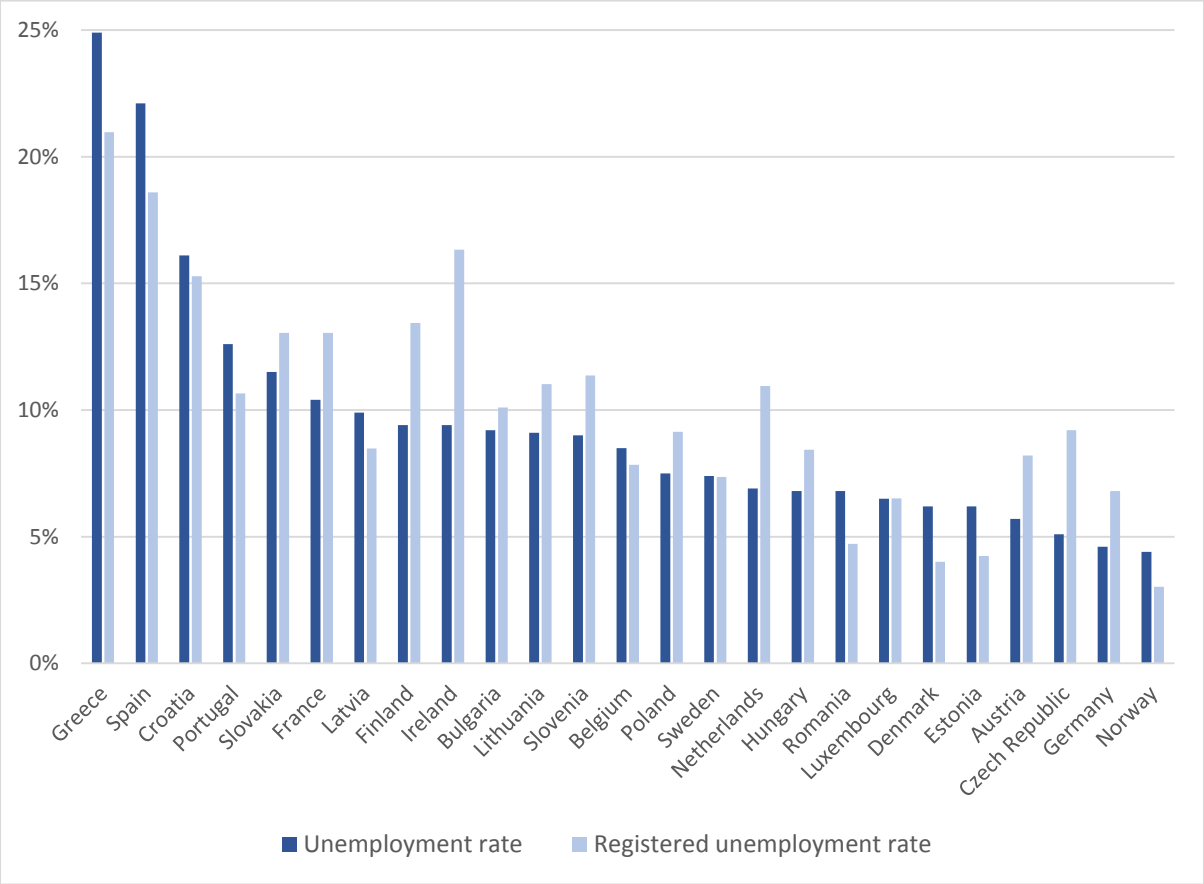
Indicator	Brief definition	Preferred and/or most common source
Productivity and wages		
Labour productivity	Output produced per unit of labour. Two ways of measuring this are calculating the GDP per person engaged or the GDP per hour worked.	National accounts and labour force survey
Average monthly wages (earnings of employees)	Gross remuneration in cash and in kind paid to employees, as a rule at regular intervals, for time worked or work done together with remuneration for time not worked, such as annual vacation, other type of paid leave or holidays.	Establishment survey
Real average monthly wage growth	Annual growth rate of real average monthly wages, defined as nominal average wages of all employees adjusted for consumer price inflation.	Establishment survey
Gender wage gap	Difference between hourly wages of male and female employees expressed as a per cent of hourly wages of male employees.	Establishment survey
Labour income share	Share of national output used to remunerate labour, measured as the total compensation of employees (wages and social protection transfers) as a per cent of GDP.	National accounts
Social protection		
Social protection coverage rate	Share of the population effectively covered by a social protection system. That is, the share of the population actually receiving benefits of contributory and non-contributory social protection programmes or actively contributing to social insurance schemes.	Various types of administrative records
Industrial relations		
Trade union density rate	Employees who are trade union members as a per cent of total employees. An additional measure could be persons in employment (employees and self-employed) who are trade union members as a per cent of total employment.	Labour force survey, unions' records, other administrative records
Collective bargaining coverage rate	Employees covered by collective bargaining as a per cent of total employees. An additional measure could be persons in employment (employees and self-employed) covered by collective bargaining as a per cent of total employment.	Collective agreements, unions' records, other administrative records
Strikes and lockouts	Number of strikes and lockouts having taken place, at least in part, during the reference period. A strike is a temporary work stoppage by one or more groups of workers, while a lockout is a total or partial temporary closure of one or more places of employment, or the hindering of the normal work activities of employees, by one or more employers, both with a view to enforcing or resisting demands or expressing grievances.	Labour relations records, special collections
Workers involved in strikes and lockouts	All workers implicated directly or indirectly at any time during a strike or lockout, whether the involvement was for the full duration of the strike or lockout or only part of it, excluding secondary effects of strikes and lockouts.	Labour relations records, special collections
Days not worked due to strikes and lockouts	Total number of working days not worked as a result of strikes and lockouts during the reference period, in terms of the actual working days during which work would normally have been carried out by each worker involved had there been no stoppage.	Labour relations records, special collections

Indicator	Brief definition	Preferred and/or most common source
Occupational safety and health		
Fatal occupational injuries	Personal injuries or diseases resulting from an occupational accident (an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death) causing the death of the victims within one year of the day of the accident.	Insurance records, other administrative records
Non-fatal occupational injuries	Personal injuries or diseases resulting from an occupational accident (an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death) leading to lost working time.	Insurance records, other administrative records
Incidence rate of fatal or non-fatal occupational injuries (per 100,000 workers)	Cases of fatal or non-fatal occupational injuries per 100‘000 workers in the reference group (workers covered by the source of statistics).	Insurance records, other administrative records
Frequency rate of fatal and non-fatal occupational injuries (per 1,000,000 hours worked)	Cases of fatal or non-fatal occupational injuries per 1‘000‘000 hours worked by the workers in the reference group (actual hours worked by all workers covered by the source of statistics).	Insurance records, other administrative records
Labour inspectors	Public officials or other authorities who are responsible for securing the enforcement of legal provisions on conditions of work and the protection of workers; supplying technical information and advice to employers and workers concerning how to comply with the legal provisions; and bringing to the notice of the competent authority defects or abuses not covered by existing legal provisions. They have the authority to initiate processes that may lead to legal action.	Labour inspection records
Labour inspection rate (per 10,000 workers)	Labour inspectors per 10‘000 workers covered by labour inspection.	Labour inspection records
Labour inspection visits	Physical presence of a labour inspector in a workplace for the purpose of carrying out a labour inspection and which is duly documented as required by national legislation.	Labour inspection records

With the definitions presented above in mind, there are a few common misconceptions or sources of confusion. One example relates to the two very different (and non-comparable) indicators: the unemployment rate and registered unemployment rate, which are often quoted indistinctly. These two indicators refer to different concepts and come from different sources, which means that they convey information on very different things and are not strictly comparable or interchangeable, but rather complementary. The unemployment rate conveys the share of persons in the labour force who are not in employment but available and seeking. The registered unemployment rate conveys the share of persons in the labour force who are registered at employment offices or other

competent authorities, which may imply that they are receiving unemployment benefits or not (depending on the national context). The registered unemployment rate is therefore, in principle, a more restrictive indicator in that it covers only the jobless who are registered with the relevant authority (and perhaps receiving unemployment benefits), excluding all other jobless persons. The unemployment rate, in contrast, covers all jobless persons who are available and seeking employment, regardless of whether they are registered or not. Figure 4 shows these two measures for a set of European countries with available data.

Figure 4. Unemployment and registered unemployment rates in a set of European countries, 2015.



Source: EUROSTAT. Unemployment refers to the annual average from the European Labour Force Survey. Registered unemployment refers to persons registered with the public employment service as unemployed. Both rates are calculated using the same denominator (annual average of labour force from the EU-LFS).

Figure 4 provides clear examples of how unemployment and registered unemployment differ, demonstrating the importance of interpreting each of them for what they really represent. It is of particular interest to note that in some cases the unemployment rate is higher than the registered unemployment rate, which may mean that the criteria to register as unemployed are too strict or restrictive, or that for some reason unemployed choose not to register, signalling a lack of incentives to register. There are also a number of countries in which the registered unemployment rate is higher than the unemployment

rate, which may imply that persons registered as unemployed are not always actively seeking employment or available for employment (or perhaps even not strictly jobless – being jobless for the purposes of the unemployment definition usually corresponds to not having worked for even one hour during the short reference period).

It may also sometimes be hard to understand the actual meaning of unemployment rates. For instance, if the unemployment rate for any given population group is lower than that of any other population group (for example, comparing male/female rates or youth/adult rates), this means that the share of the labour force not employed but looking for job and available is lower for one population group. Further information is needed to have a more in-depth understanding of why: is this population group better off in the labour market and are there more suitable jobs available for them, or on the contrary, are they so vulnerable in the labour market that they have to resort to any type of employment or leave the labour force altogether as soon as they become jobless?

Another example worth mentioning pertains to statistics on monthly earnings (or monthly wages) by sex. These statistics provide valuable information on male and female monthly earnings and on how they differ, but that is all. In order to explore the reasons and extent of the differences, these statistics need to be supplemented with other indicators. If average monthly earnings are lower for female employees than for male employees, it does not necessarily imply that women are paid less than men for the same work. This could certainly be happening, but there could be other issues happening as well, such as differences in economic activities and/or occupations (is the difference as significant when comparing male and female earnings for the same economic activity and the same occupation? Are women less represented in the higher-paid economic activities and/or occupations?), differences in status of employment (are women more represented in the status in employment groups associated with vulnerable employment?) and differences in working time (do women work less hours per month? If so, is it voluntarily? Are time-related underemployment and/or involuntary part-time rates higher for women?). The gender wage gap by economic activity and/or occupation (based on hourly wages) is a great measure to cast light on gender earnings differences not explained by differences in the economic activity and/or occupation and the working time.

Comparability assessment for cross-country or time series studies

When doing cross-country analyses and/or analyses over time, it is crucial to ensure that the statistics are strictly comparable across countries and that time series are robust. Any major change in the statistical source used or in the methodology applied (including changes in coverage) will cause a break in series and perhaps hinder international comparability, and this needs to be accounted for when drawing analytical conclusions.

6.2. Leading indicators versus lagging indicators

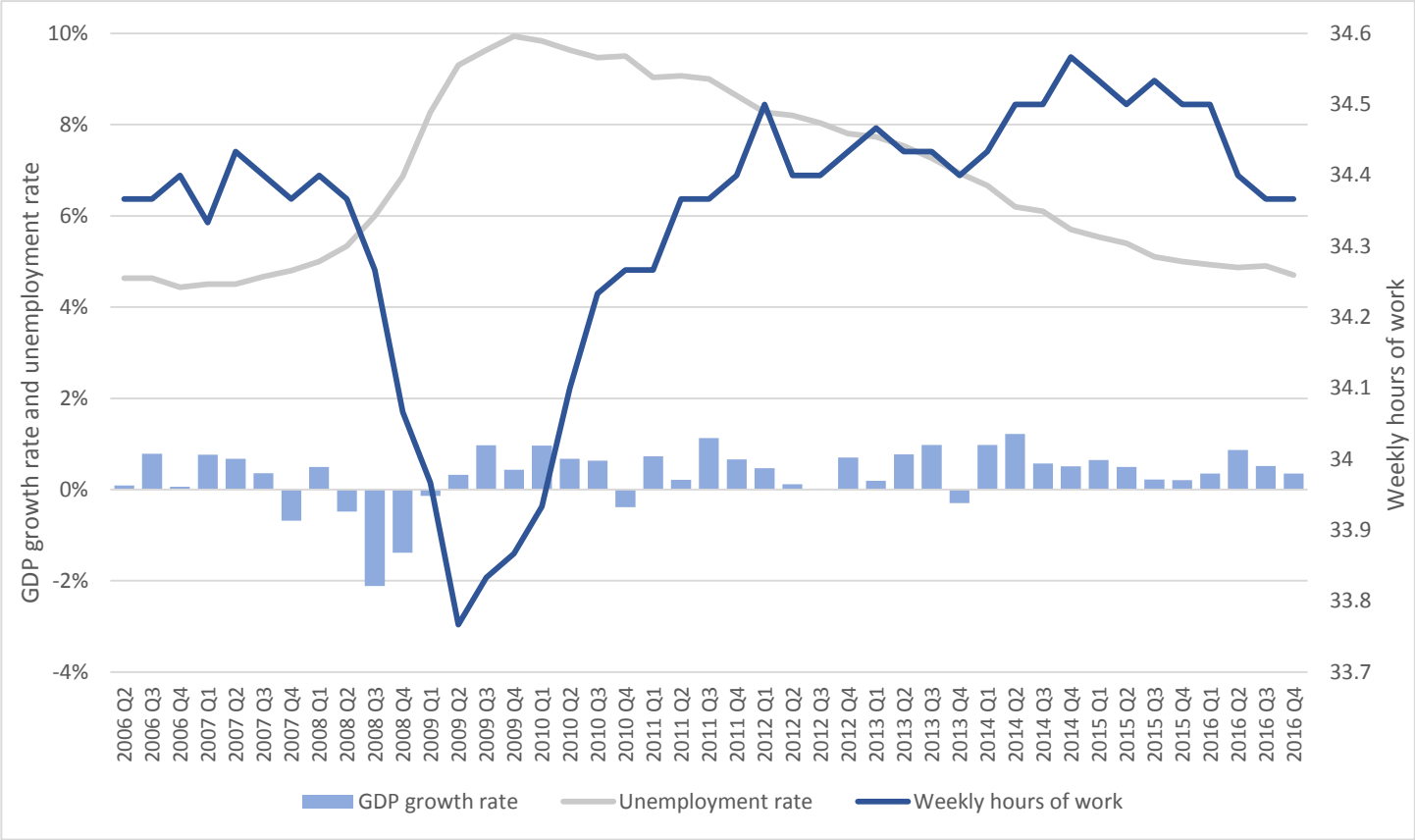
Whether a given labour market indicator is a leading or lagging indicator must be taken into account when interpreting the statistics, and especially when doing a trends analysis. Leading indicators look forward, that is, they signal future events. They provide information somewhat predicting future events or future trends. Conversely, lagging indicators are backward-looking, in that they reflect what happened in the previous period, they follow the event, or show the impact of the event with some delay.

Typically, leading indicators refer more to input measures (measures signalling the state of the economy by referring to the use of the labour input and/or the capital input and the resulting production activity, such as measures of manufacturing activity, consumer confidence, or inventories) whereas lagging indicators refer more to output (measures reflecting changes in the economy that have already taken place by referring to items which adjust to the new economic situation, such as revenue, wages and prices). Leading indicators are easier to influence since they are at the foundation of trends or events, but they are harder to measure. It is much harder to exert an effect on lagging indicators, though they are easier to measure, since they confirm an already-occurring pattern. Lagging indicators refer to results and consequences, whereas leading indicators refer to the origin of economic trends, their roots and causes.

Both types of indicators provide valuable information, particularly on the labour market, and should ideally be studied together. When interpreting labour market statistics, it is crucial to understand before drawing any conclusions whether the indicators analysed are leading or lagging, so as to accurately grasp the implications on other indicators and on labour market performance in general.

In the field of labour market statistics, leading indicators are harder to find than lagging indicators, since the labour market generally reacts to what happens in the economy. An example of a leading labour market indicator are the hours actually worked, given that employers may react to their predictions of growing or decreasing business by adjusting the employees' working time immediately. The unemployment rate is a very well-known example of a lagging indicator, in that it reflects that the economy did not perform well in the past and thus, there is increased labour market slack as there is a lack of suitable jobs for job seekers. Figure 5 below shows an example of how these indicators signal or react to events: in the United States, the drop in GDP growth observed from 2007 manifests the start of the economic crisis, which caused the unemployment rate to subsequently rise, and weekly hours of work to adjust as the economic hardship spread and intensified.

Figure 5. GDP growth rate, unemployment rate and weekly hours of work in the United States, 2006-2016.



Source: US Bureau of Labor Statistics for the unemployment rate (quarterly average from the Current Population Survey, referring to persons aged 16 and above) and the weekly hours of work (quarterly averages covering all private sector employees from the Current Employment Statistics Survey) and US Bureau of Economic Analysis for the GDP growth rate (per cent change from preceding period based on chained 2009 dollars). All three measures are seasonally adjusted.

6.3. Units of measurement and central tendency measures

Other crucial characteristics of labour market indicators, with an obvious impact on their meaning and interpretation, are the units of measurement used, as well as the central tendency measures chosen for the relevant indicators.

Units of measurement

The unit of measurement used are part and parcel of the indicator, and they should be kept in mind when analysing the data. In most cases, the unit is very obvious and straightforward, but in other cases, it may be that the unit is less evident and so attention should be paid to it to ensure accurate interpretation of the statistics.

Some labour market indicators will refer to the number of persons in a given situation, for instance, employment conveys the number of persons employed, time-related underemployment conveys the number of persons in time-related underemployment, unemployment conveys the number of persons unemployed, to name a few.

Indicators may also relate to items, events or cases, instead of persons. For instance, statistics on strikes and lockouts refer to the number of work stoppages that occurred, and statistics on inspection visits refer to the number of times a labour inspector went to a workplace to conduct an inspection.

It is however difficult to comprehend the trends and significance of large numbers referring to thousands or millions of persons (or items, cases, etc.) so the units of many headline labour market indicators are percentages, rates or ratios, which are typically easier to grasp than absolute numbers. This is the case, perhaps most notably, of the labour force participation rate, the employment-to-population ratio and the unemployment rate.

Implications of the data source

The source of data used determines to a great extent the measurement unit of labour market indicators.

For instance, when it comes to statistics of occupational injuries, insurance records will most likely provide data on the number of cases of occupational injuries compensated. That is, the statistics would refer to the number of injuries incurred, and not necessarily the number of injuries incurred by different people (one worker victim of more than one occupational injury during the reference period would be counted as many times as the number of injuries he or she suffered from). However, statistics on occupational injuries could also potentially be derived from household surveys (where the survey questionnaire covers this topic) and in this case, they would most likely refer to the number of persons who incurred one or more occupational injuries during the reference period (perhaps with information on how many injuries each worker suffered).

Similarly, data on employees from a household survey refers to the number of persons who are employees, whereas establishment survey data refers to the jobs, not the persons.

Central tendency measures (mean, median, mode)

For some specific indicators, it is necessary to choose the most appropriate central tendency measure. That is, a summary measure that would represent the typical value of a set of numerous different observations, by conveying the centre of the distribution of that series of single values. The main central tendency measures are the mean, the median and the mode.

The mean (or more accurately, the arithmetic mean, also known as the average) corresponds to the sum of all the values in the corresponding dataset divided by the number of values (or observations) in the dataset. The mean is very susceptible to outliers, that is to say, unusually low or high observations in the dataset will have a strong impact on the mean, since in the calculation of the mean each observation has a weight as strong as its value.

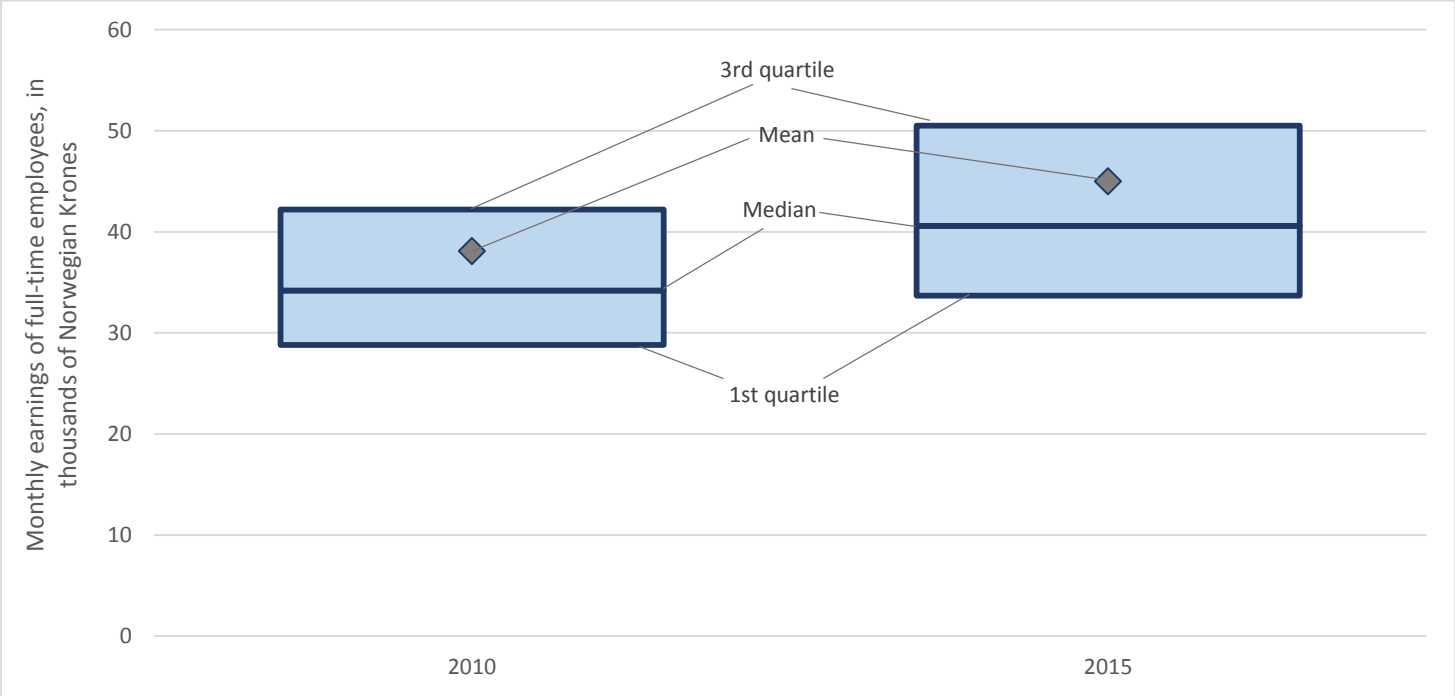
The median is determined by sorting all the observations in the dataset in ascending order: it refers to the value of the observation occupying the middle spot in the sorted series. In other words, the median corresponds to the value which divides the dataset into two groups containing the same number of observations (half of the observations are above the median and half of the observations are below the median). The median is much less vulnerable to the effect of outliers, since in the calculation of the median every observation has exactly the same weight, regardless of their value.

Instead of dividing the dataset in ascending order into two halves to obtain the median, we could also divide it into four fourths to obtain quartiles (the first quartile is the value below which 25 per cent of observations and above which 75 per cent of observations are found, the second quartile corresponds to the median, that is, the value below and above which 50 per cent of observations are found, and the third quartile is the value below which 75 per cent of observations and above which 25 per cent of observations are found) or into ten tenths to obtain deciles.

The mode represents the most frequent value appearing in the data series. It is not necessarily a unique number, since it is possible to have more than one mode for a given dataset (more than one value share the first place in terms of highest frequency of observations). The mode, just as the median, is not really affected by outliers.

Regarding labour statistics, the main indicators that call for the use of a central tendency measure are the indicators pertaining to hours of work and earnings. In these cases, it is crucial to bear in mind the central tendency measure being used, since it will have a great impact on the figures and their meaning. In particular, when doing trends or cross-country studies, it is paramount to ensure that the same central tendency measure is used throughout the dataset, or else the comparability of the data will be severely hindered, possibly leading to erroneous conclusions.

Figure 6. Mean, median and quartile monthly earnings of full-time employees in Norway, 2010 and 2015.



Source: Statistics Norway (full census from the new *A-ordningen* for 2015, and sample of private sector businesses and public sector registers for 2010).

Figure 6 shows the evolution of the quartiles, the median and the mean for employees' earnings in Norway between 2010 and 2015. There was a general increase in earnings between 2010 and 2015. Nevertheless, earnings inequalities also increased, given that the boxes for 2015 are wider than those for 2010 in the graph (the difference between quartiles is bigger for 2015). The mean is above the median for both 2010 and 2015, which implies that the earnings distribution is more concentrated at the lower end than at the upper end. In other words, there is a higher variability among high earnings than among lower earnings: the earnings of the 25 per cent least remunerated workers differ less among each other than the earnings of the 25 per cent most highly paid workers.

6.4. Uncertainty and reliability

Statistics derived from surveys (whether household surveys or establishment surveys) are subject to a number of limitations linked to the sample design and more generally, due to the fact that a sample is used to refer to the whole population. The results observed for the selected sample can be extrapolated to the whole population (and representative of the whole population), depending on the characteristics of the sample design and the sample size; however there is always some degree of uncertainty associated with estimates from surveys. Ideally, this uncertainty would be kept to a minimum, but in any case, it is important to be aware of this when using survey statistics.

To keep the uncertainty to acceptable levels, it is necessary to measure it. The most common way of measuring the level of uncertainty is through sampling variability

(variation) and it involves defining a range around each survey estimate (the confidence interval) within which the real value behind that estimate is likely to be found, with a quantifiable degree of certainty. This degree of certainty for the confidence interval is determined based on personal preferences (or institutional rules) by the individuals manipulating the data. Typically, confidence intervals are calculated to be 95% confident that the true value lies within that range. Confidence intervals of survey estimates allow the data user to understand how certain the statistics are, and they are usually disseminated along with the survey results or in the accompanying methodological documents. In general, national statistical offices and official agencies in charge of producing and disseminating statistics only release survey estimates with an acceptable degree of uncertainty.

Another issue pertaining to the quality of statistics derived from surveys is the fact that the information comes from the respondents to the survey questionnaire. Thus, the reliability of the results is determined by the accuracy of the responses to the questionnaire, and how well respondents understood each question. When questions are misunderstood or respondents do not know the answer to some questions but respond nonetheless, this results in random errors. Naturally, the less random error in responses, the more reliable the question and the resulting estimates. Reliability tends to be low for questions about topics that people do not usually have much knowledge about, or sensitive topics. The sample size plays an important role in reliability, since the higher the number of respondents to each question the higher the chance that more respondents would have replied accurately (as opposed to randomly). This is another key point to pay attention to when using survey statistics: to what extent are the survey estimates reliable? However, here too, data users can usually trust the official statistical agencies to only disseminate estimates with a satisfactory degree of reliability, or at least to carefully state it when some estimates are deemed unreliable.

6.5. Seasonal adjustments

When it comes to studying short-term trends (based on monthly or quarterly statistics) it is crucial to note that the labour market (like the economy) is probably affected by seasonal factors. That is, periodic patterns, shifts in indicators that take place around the same time every year (for example, people finishing school and newly entering the labour market at the end of the school year, agricultural activities following the weather cycle, increased touristic activities in the holidays season, etc.).

In order to account for shifts in the labour market beyond seasonal patterns, that is, to assess the variations not due to seasonal factors, one possibility is to compare data referring to the same reference period every year. However, this only allows for the study of year-to-year changes, and not short-term patterns.

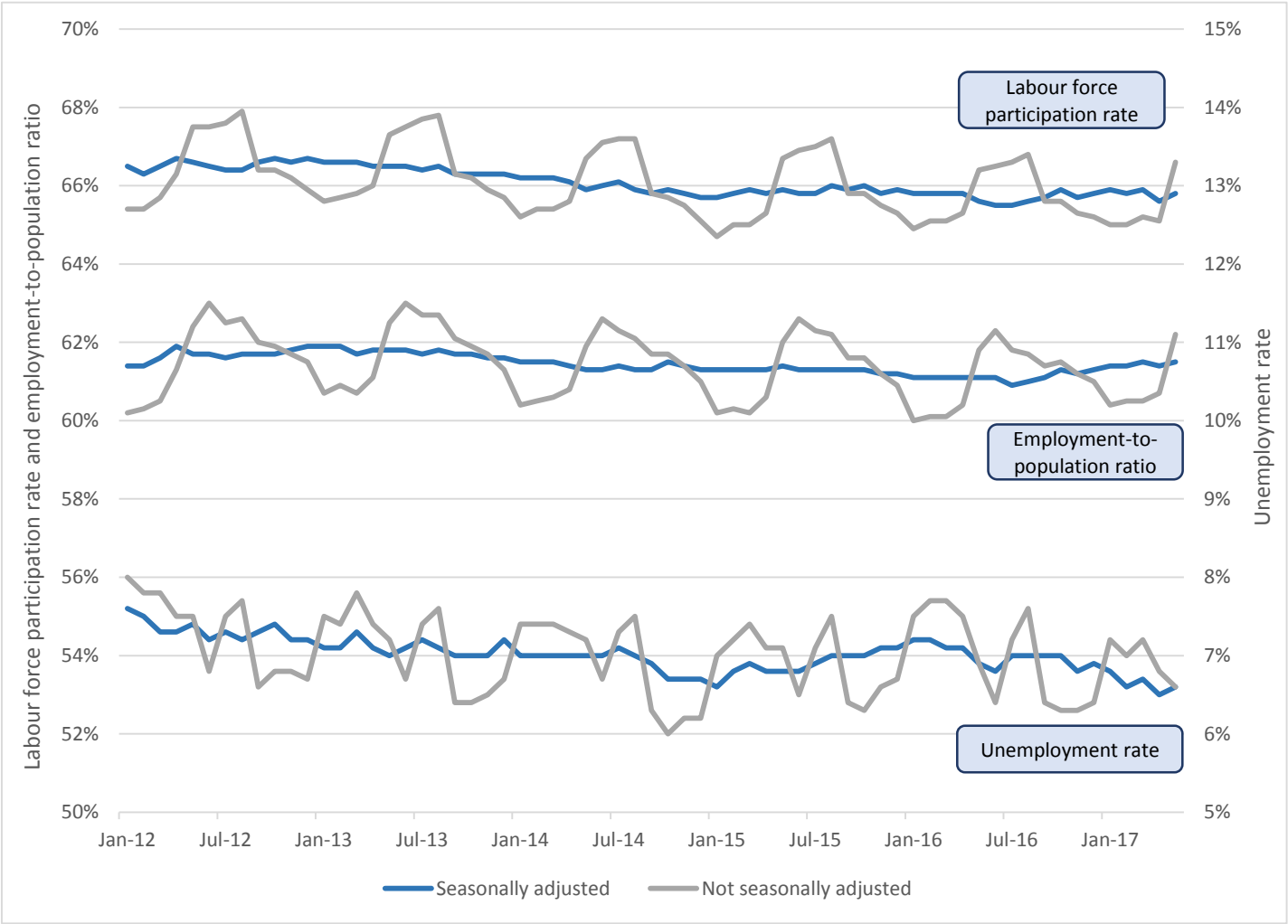
To assess short-term variations excluding the effects of seasonal factors, data can be seasonally adjusted to remove the seasonal components. There are different possible methodologies of seasonal adjustment, and the robustness of the seasonally-adjusted

estimates will depend on the adjustment method used. Many statistical offices in charge of disseminating short-term labour statistics will release seasonally-adjusted series as well as the corresponding unadjusted ones. It is recommended to refer to seasonally-adjusted statistics for analysis of labour market trends within the year not explained by changes in seasons.

This does not mean that non-seasonally adjusted short-term statistics are never useful. In fact, in some cases it may be interesting to study precisely the seasonal trends to learn more about the seasonal labour market patterns and inform labour market actors and policy-makers on this. What is crucial is to always know whether the series at hand are seasonally-adjusted or not, and to interpret them keeping this in mind.

Figure 7 below shows, as an example, how the seasonal adjustment of the series affects three headline labour market indicators (the labour force participation rate, the employment-to-population ratio and the unemployment rate) in Canada. This figure makes it very visible that the seasonal adjustment has a smoothing effect on the series. The non-seasonally adjusted series are much more volatile, due to the impact of the seasonal factors.

Figure 7. Seasonally-adjusted and unadjusted labour force participation rates, employment-to-population ratios and unemployment rates in Canada, 2012-2017.



Source: Statistics Canada (Labour Force Survey).

6.6. Labour indicators as a coherent framework

It is worth noting that, even though a given labour market indicator may convey valuable information on its own, this does not compare to the insights that are obtained when analysed in conjunction with other relevant labour market, economic or social indicators. Interpreting indicators as a coherent framework, alongside each other, building a full set of complementary measures, will allow for a much deeper understanding of the labour market situation, deficiencies and patterns. The information a single indicator in isolation provides is limited and may lead to inaccurate or incomplete conclusions. Thus, it is always preferable to verify and complement the findings with supplementary measures of related labour market topics.

The guiding principle of consolidating labour indicators as part of a coherent framework is underscored in various widely used indicator frameworks, such as the ILO's Decent

Work Indicators[26] (mentioned in section 2.5), the United Nations Economic Commission for Europe's Quality of Employment Statistical Framework[27] and the United Nations Statistics Division's Minimum Set of Gender Indicators.[28]

As an example of the importance of complementary measures, we can refer again to the statistics on employees' earnings disaggregated by sex mentioned in section 6.1. Viewed in isolation, any differences in male and female earnings may be hard to interpret and misleading even: one could (perhaps incorrectly) assume that the difference is solely due to earnings inequalities for the same amount and type of work. However, complementary measures on actual hours of work by sex, usual hours of work by sex, the employment distribution by sex and occupation (and/or economic activity), time-related underemployment rates by sex, involuntary part time employment by sex, and the gender pay gap (based on hourly earnings) will provide a more accurate and comprehensive picture of gender segregation and gender-based inequities in the labour market, allowing to gauge the extent to which earnings differences are due to differences in working time, skill levels, hourly earnings, and so on.

Similarly, and to further illustrate this point, data on the share of youth not in employment, education or training (also known as the NEET rate) casts light on the proportion of the youth population who are not in the educational system while also being unemployed or outside the labour force, which is insightful. Nonetheless, to apprise of the situation of youth in the labour market with a holistic approach, the analysis of NEET rates should be coupled with other labour market indicators pertaining to youth, such as the youth unemployment rate, the youth labour force participation rate, and indicators on the characteristics of youth employment (distribution of youth employment by status in employment, economic activity and occupation, youth working time, youth earnings, youth time-related underemployment rate, youth informality rate, etc.).

In many cases, depending on the subject of analysis, it may be preferable or necessary to complement the labour market measures with economic, social or demographic indicators. For instance, when studying the evolution of wages, it can be informative to supplement wage growth figures with economic statistics on GDP growth, the labour income share and labour productivity growth, with a view to understanding to what extent workers have benefitted from economic growth and gains in productivity.

Also, when trying to make labour market projections to predict future trends of employment and the labour force, it is crucial to take into consideration socio-demographic aspects conveyed by indicators such as life expectancy and the fertility rate. Likewise, in studying the educational patterns of the labour force and the skill level of persons employed, it is important to put the findings into context by analysing also

[26] For further information refer to the ILO manual *Decent Work Indicators - Guidelines for producers and users of statistical and legal framework indicators*, available at http://www.ilo.org/stat/Publications/WCMS_223121/lang--en/index.htm

[27] For further information refer to the UNECE's *Handbook on Measuring Quality of Employment*, available at https://www.unece.org/stats/publications/stat_qua_emp.html

[28] For further information refer to https://genderstats.un.org/#/home

literacy rates and indicators on the educational attainment of the population. These are just specific examples of how various indicators might complement each other to provide a comprehensive picture of the subject at hand, but this generally holds true across topics.

7. Concluding remarks

Labour statistics are an essential part of official statistics, useful in identifying labour market issues and deficiencies, informing policy formulation, enabling policy evaluation and allowing for macroeconomic monitoring. They present a clear public interest in that they seek to inform and promote the common understanding of labour market issues. They have a very wide scope, potentially covering both labour supply and labour demand, the micro and the macro levels, and all economic actors (individuals, enterprises and the public sector), thus providing a comprehensive picture of the situation of the labour market as well as information on its socioeconomic context.

It is the analytical power of labour statistics that makes them a valuable resource: their true worth lies not in their mere existence, but in their subsequent interpretation. The production and compilation of labour statistics is not a goal but a means to facilitate macro-economic monitoring, labour market performance evaluation, evidence-based policy formulation and implementation, assessment of policy results, etc.

However, for labour statistics to fully serve their purpose, they must be accurate, valid, reliable and timely. To allow for the study of trends and fluctuations and to favour cross-country studies, labour statistics should also be comparable over time and across countries. In this regard, the use of international standards pertaining to labour statistics is crucial to ensure data quality, methodological soundness and international comparability.

Labour statistics can be derived from a variety of sources, including household surveys (most notably labour force surveys), establishment surveys and administrative records. The characteristics of the specific sources of data used have great implications for the resulting figures and will ultimately determine their quality and reliability. When using labour statistics, it is particularly important to take into account the geographical and population coverage of the underlying sources as well as the concepts, definitions and operational criteria applied.

With thorough information on the source of data, the methodology underlying the production of statistics and the extent to which international standards were followed, data users will be able to avoid misleading conclusions and common misconceptions, and give their labour market studies a solid foundation based on valid, reliable and comparable labour statistics.

8. Annex: Summary information on the sources of labour statistics

Broad source types	Source types available in ILOSTAT	Sampling/ investigation unit	Unit of analysis	Key advantages	Key drawbacks	Examples of topics covered
Population census	Population census	Household	Individual	- Comprehensive enumeration, universal coverage - Reliable information on small groups and areas - Serves as sample frame	- Very costly - Infrequent (typically every 10 years) - No detailed information on specific topics	Population, working-age population, education, main labour market indicators
Household surveys	Labour force survey	Household	Individual	- Comprehensive coverage of population (employed, unemployed and outside the labour force) - Detailed questioning for more precise measurement - Study of short-term trends	- Sampling errors - Sampling prevents reliable estimates for small groups and areas - Lower quality of data on "sensitive", income and employer-related topics - Data quality depends on accuracy of respondents - Cannot provide estimates of vacancies, training needs, etc.	Labour force, employment, unemployment, labour underutilization, earnings, working time
	Household income/expenditure survey					Working poverty
	Child Labour Survey					Child labour
	Other household survey					…

Broad source types	Source types available in ILOSTAT	Sampling/ investigation unit	Unit of analysis	Key advantages	Key drawbacks	Examples of topics covered
Establishment census or surveys	Economic or establishment census	Establishment	Job	- Comprehensive coverage of larger businesses - Payroll records provide consistent and reliable data for wages and employment by industry - Only source for data on vacancies, training needs, etc.	- Typically poor coverage of small and unregistered businesses - Difficult identification of small or informal units - High non-response rates - Sampling prevents reliable estimates for small groups and areas - Data items are limited by the information in establishment registers - No information on persons not in paid employment	Employees, wages, labour cost, working time
	Labour-related establishment survey					
	Other establishment survey					

Broad source types	Source types available in ILOSTAT	Sampling/ investigation unit	Unit of analysis	Key advantages	Key drawbacks	Examples of topics covered
Administrative records	Insurance records	Collective agreement, trade union, employers' organization, establishment, record, individual, etc.	Insured person	- Total count allows maximum detail- Usually exhaustive coverage of the universe- Inexpensive to compile statistics- Data readily available (no compilation efforts)	- Often poor coverage (small universe)- Often not up to date- Data quality may be questionable- Units and concepts do not refer to statistical standards	Occupational injuries
	Employment office records		Job seeker			Registered unemployment
	Collective agreements		Agreement, worker covered			Collective bargaining coverage
	Labour inspectorate records		Workplace liable to inspection, inspection activity, staff member			Labour inspection visits, occupational injuries
	Records of employers' organizations		Member employer, employees			Strikes, employees
	Records of workers' organizations		Member worker			Union membership
	Population register		Registered person			Population
	Establishment or business register		Registered unit			Employees
	Other administrative records		...			...
National accounts	National Accounts	-	-	-	-	Labour share