

Measuring hours worked

Definitions

In the national accounts framework, for the purposes of productivity measurement, labour input is most appropriately measured as the total number of hours actually worked by all persons engaged in production (2008 SNA, para 19.47). It is instructive to consider the relationship between this concept and related measures of working time (see also Table 8.1):

- *Hours actually worked* – the hours actually spent on productive activities;
- *Hours usually worked* – the typical hours worked during a short reference period such as a week over a longer observation period;
- *Hours paid* – the hours worked for which remuneration is paid;
- *Contractual hours of work* – the number of hours that individuals are expected to work based on work contracts;
- *Overtime hours of work* – the hours actually worked in excess of contractual hours; and
- *Absence from work hours* – the hours that persons are expected to work but do not work.

Table 8.1. Relationship between different concepts of hours worked

Overtime hours of work					Absences from work			
Irregular overtime		Regular overtime			Irregular absence		Regular absence	
Unpaid	Paid	Paid	Unpaid		Unpaid	Paid	Paid	Unpaid
				Contractual hours				
				Hours actually worked				
				Hours usually worked				
				Hours paid for				

Note: Establishing the relationship between normal hours and the five other concepts is not possible, as normal hours are established on a case-by-case basis.

Source: ILO (2008), Measurement of working time, 18th ICLS.

Because productivity analysis relates the inputs used in producing a given output, with that output, the underlying concept for labour input should include all hours used in production, whether paid or not, and so should exclude those hours not used in production, even if some compensation is received for those hours. As such the relevant concept for measuring labour input is *hours actually worked*. The productive or non-productive characteristic of an activity is determined by its inclusion in, or exclusion from, the System of National Accounts (SNA) production boundary. *Hours actually worked* are defined as (ILO, 2008):

- the hours spent directly on productive activities or in activities in relation to them (maintenance time, cleaning time, training time, waiting time, time spent on call duty, travelling time between work locations);
- the time spent in between these hours when the person continues to be available for work (for reasons that are either inherent to the job or due to temporary interruptions); and
- short resting time.

Conversely, *hours actually worked* should exclude:

- annual leave and public holidays;
- longer breaks from work (e.g. meal breaks);
- commuting time (when no productive activity is performed); and
- educational activities other than on-the-job training time.

Data sources

The majority of countries use multiple sources to compile estimates of average hours worked per person, in particular for employees, often using *labour force surveys* as a main or secondary source in combination with other main and/or secondary data sources, such as *population census*, *business statistics* and *administrative records* (Ward et al., 2018).

- *Labour force survey*. The labour force survey (LFS) is the most comprehensive and well-established source for information on the composition and characteristics of the labour force. LFS include questions on the number of hours actually and usually worked in the reference period, i.e. questions concerning the differences between the time usually spent working and the time actually worked during the reference week. Additional LFS questions concerning working time components such as hours worked at home, commuting time, short breaks, overtime and absences from work are also often available. International harmonisation is achieved by complying with definitions set out by the International Labour Organisation (ILO, 1982 and 2013), although sample selection, survey techniques, survey responses and the implementation of ILO concepts may vary between countries. An advantage of the LFS is that it covers a broad range of employment situations, including the self-employed, unpaid family workers and informal employment, as well as collecting information on multiple-job holdings, hours usually and actually worked, and paid and unpaid overtime. Its main limitation from the perspective of national accounting, and hence, productivity analysis, is the often limited consistency with output and value-added measures, in particular, by industry, as the LFS is a household survey for which the stratification process may not adequately capture the homogenous strata required in productivity analysis. In addition, in many countries, the LFS does not cover some groups of the population such as persons below or above certain age thresholds (which varies by country), those living and working in communal establishments (such as prisons or long-term care facilities), collective households (such as religious institutions) and the armed forces, all of whose output is included, at least in theory, in estimates of GDP. In addition, the sampling structure of LFS is based on the population usually residing in the country and includes workers in non-resident production units, whereas non-resident cross-border workers working in resident production units are excluded. There may also be biases in LFS responses, reflecting the self-reporting nature of LFS, and these biases, that may also be cultural, appear to be significant with respect to responses on hours actually worked.
- *Population census*. The population census (PC) is a comprehensive source covering the whole population of a country, making it a useful tool to benchmark household surveys, including the LFS. The main disadvantages are the low frequency of data collection, which is typically carried out every five or ten years, and the possibility that unregistered migrants may not be captured.
- *Business statistics*. Business statistics (BS) include establishment and/or enterprise surveys, business census, and dedicated labour cost surveys. Another important data source is the statistical business register (SBR) which is typically sourced from

multiple primary data sources, including business surveys and a variety of administrative data. BS typically provide detailed data on employment and hours worked following a detailed industrial classification of firms that is generally consistent with their classification in national accounts output and value-added data – indeed structural business statistics are an important input to, and building block for, the national accounts. One of the main limitations of BS, however, is that they sometimes exclude establishments or enterprises below a certain employment or turnover threshold and certain categories of firms, such as unincorporated businesses, self-employed persons and informal labour. A further limitation of some business statistics, such as dedicated labour cost surveys, is that they often provide information on hours paid or contractual hours only, and not information on absences from work and unpaid overtime, and, so, do not align with the concept of hours actually worked required to measure labour input in productivity analysis.

- *Administrative data sources* – Administrative data sources (AS) are typically collected by government bodies – but also increasingly by private data providers (e.g. associations for specific groups) – based on some form of statutory or voluntary registration. For example, statistics from social security institutions and tax administrations can provide information on all persons required to pay income tax or social insurance contributions. Social security records, tax registers, compulsory business registration systems, resident permit registers, migration statistics, and statistics on the armed forces, are the administrative sources most commonly used by countries in compiling estimates of labour input. AS may include information on wages, entrepreneurial income, taxes, etc. as well as a series of demographic variables describing age, gender, and family ties. The main advantage of AS is that they are generally comprehensive, at least with regards to the population that they purport to cover, and do not entail additional collection costs to the national statistical offices (NSOs) as compared to surveys. Like BS however, AS often struggle to capture informal labour.
- *Other sources*. Statistical offices may use other complementary sources to estimate labour input that do not fall neatly into any of the above categories. Among others these can include time-use surveys, surveys on households' living conditions, tourism surveys, and surveys of insurance companies.

Table 8.2 summarises the main strengths and limitations of the primary sources typically used to compute hours worked and employment estimates in national accounts.

Table 8.2. Primary sources used to compute national accounts estimates of hours worked and employment

Primary data source	Main strengths	Main limitations
Labour force survey	<ul style="list-style-type: none"> Covers employees, self-employed, unpaid family workers, government and NPISH workers Includes information on the characteristics of employment: age, gender, education, industry, occupation Provides information on hours actually worked Harmonised concepts across countries (ILO concepts) Typically counts the number of persons 	<ul style="list-style-type: none"> It is a household survey and so may have limited consistency with output and value added measures collected in business surveys, especially by industry Concept of employment typically not be in line with the resident (domestic) concept in national accounts There may be reporting biases in reported hours worked Excludes people living in collective households, although this is unlikely to significantly affect numbers of persons employed
Business statistics (establishment surveys, business census, labour cost surveys)	<ul style="list-style-type: none"> Information consistent with output data Covers production units operating in the territory: domestic concept of employment 	<ul style="list-style-type: none"> Typically excludes information on agriculture and government sectors - although these are covered in comparable surveys May exclude small enterprises below a certain employment or turnover threshold and certain categories of firms, such as unincorporated, self-employed and informal. Information on hours paid or contractual hours, excludes absences and unpaid overtime Not necessarily harmonised across countries, although when presented as structural business statistics comparability is generally improved
Population census	<ul style="list-style-type: none"> Can be used as a benchmark 	<ul style="list-style-type: none"> Low frequency of data collection (typically every 10 years)
Administrative sources (e.g. social security registers, tax registers)	<ul style="list-style-type: none"> To complement data on employment and labour income/compensation 	<ul style="list-style-type: none"> There is often restricted access (micro data) Difficult to capture the informal economy
Time use surveys	<ul style="list-style-type: none"> To complement and compare data on hours worked 	<ul style="list-style-type: none"> Low frequency data Limited international comparability

For the purposes of productivity analysis, consistency of total hours worked with *national accounts* concepts needs to be ensured (OECD, 2009; Ward et al., 2018)). This implies adjusting the coverage of activities covered by the labour input measures to those covered in GDP, i.e. adapting the geographical and economic boundaries of employment and hours worked to the national accounts production boundary. The notion of economic territory used to compute GDP refers to the domestic concept, so that when compiling labour input measures, resident persons working non-resident units should be excluded while non-resident persons working in resident-units should be included.

Methods

In essence, there are two main approaches to compute estimates of total hours actually worked:

- The *direct method*, which consists of annualising average actual weekly hours worked derived from continuous surveys in all weeks of the calendar year (i.e. multiplying the number of self-reported actual hours worked in the reference week by the number of working weeks in a year). This method often relies on a single source, generally the LFS, and assumes that full- and part-week absences and extra hours worked in the main and/or additional job/s are well captured in self-reported actual hours worked averaged over the year.
- The *component method*, which starts from estimates of contractual, paid or usual hours per week from establishment surveys, administrative sources or, indeed, the

LFS, with adjustments for absences (holidays, sickness, maternity leave, etc.) and (paid and/or unpaid) overtime. This is an indirect approach, as its starting point is not the target concept (hours actually worked) and, rather, requires a series of explicit adjustments (i.e. accounting for each component) to align with the concept, which is why it is often referred to as the component method.

For labour force surveys with fixed monthly reference weeks (i.e. where the survey is not conducted continuously in all weeks of the month or the quarter but in a given week of the month), the direct method consists of averaging hours worked during those 12 reference weeks after applying adjustments for special events, such as holidays, falling outside each reference week. This is the method applied, for example, in Australia and Canada. As discussed in Ward et al. (2018), this is a *direct method with adjustments* that resembles a component approach, as it corrects for annual leave and public holidays, which are the most important reasons for work absences, followed by sickness leave, and the most important reason, after differences in usual hours, to explain cross-country differences in annual working time.

Hours worked data in the OECD Productivity Statistics (database)

In the PDB, the main requirement is that the most internationally comparable hours worked data are used (OECD, 2007). The preferred source for total hours worked is countries national accounts, which are presented in the *OECD National Accounts Statistics* (database), both for the total economy and for aggregate economic activities. However, long time series of hours worked are not available for a number of countries; in which case, the Secretariat estimates hours worked using the *OECD Employment and Labour Market Statistics* (database). Total economy estimates of average hours actually worked per year and per person employed are currently available on an annual basis, for all 36 OECD member countries and some key partner economies as follows:

- Actual hours worked are primarily sourced from the *OECD National Accounts Statistics* (database) for Australia, Belgium, Canada, Costa Rica, the Czech Republic, Denmark, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Korea, Luxembourg, Mexico, the Netherlands, Norway, the Slovak Republic, Slovenia, South Africa, Spain, Switzerland, and the United States.
- Actual hours worked are sourced from the *OECD Employment and Labour Market Statistics* (database) for Chile, Japan, New Zealand, the Russian Federation and Turkey.
- Since January 2019, actual hours worked for Austria, Estonia, Finland, Greece, Latvia, Lithuania, Poland, Portugal, Sweden and the United Kingdom are estimated by the OECD Secretariat applying a simplified component method on EU LFS data, as described and following the recommendations in Ward et al. (2018).
- For some countries, longer time series and/or more recent estimates of total hours worked are derived using the *OECD Economic Outlook: Statistics and Projections* (database), the *OECD Main Economic Indicators* (database) and national sources.

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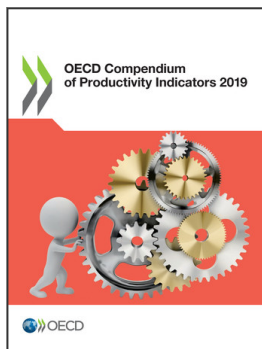
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