

Measuring hours worked

Hours worked for productivity analysis: main definitions

Within the *OECD Productivity Statistics* (database) (PDB), the underlying concept for labour input is *total hours actually worked by all persons engaged in production*. It is instructive to consider the relationship between this concept and related measures of working time (Table 7.1):

- *Hours actually worked* – 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 for* – 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 7.1. 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.

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Because productivity analysis is interested in measuring the inputs used in producing a given output, the underlying concept for labour input should include all hours used in production, whether paid or not. They 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 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.

Measuring hours worked in national accounts

In general, *Labour Force Surveys* (LFS) are the main source used to compile hours worked data in a majority of countries. LFS is most often also the principal underlying source for total hours worked estimates in *National Accounts* – the main source ultimately used in the *OECD Productivity Statistics* (database). 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 work at home, commuting time, short breaks, overtime and absence from work are also often available.

Continuous labour force surveys are especially appropriate for measuring working time as they allow direct collection of data on hours actually worked throughout the year. This method is known as the *direct method*, as it is based on a direct measure of average actual hours of work during each week of the year, effectively taking into account all types of absences from work and overtime.

However, when LFS are not continuous, the *direct method* to measure actual hours worked during the year is not applicable. In these cases, estimates are built using the *component method*. Thereby, data are collected for a specific reference week (e.g. one week during a month) and complemented with other data to build annual estimates of actual hours worked during the year. The component method starts with the usual hours of work collected in the LFS and then adjusts for absences from work such as holidays, bank holidays, illness, maternity leave, overtime, etc. Annual totals are then derived by scaling up the weekly estimate.

In some countries, LFS are not used or are complemented with information from other sources. Among such other sources are the following:

- *Establishment (and enterprise) surveys*. These are typically the main source of information for hours worked estimates by industry. One of the main drawbacks of this source is that the data collected generally refer to hours paid rather than actual hours worked, hence include paid absences and exclude unpaid overtime.
- *Population census*. These cover the whole population and are often used as a benchmark for most household surveys including LFS. The main disadvantage is the low frequency of data collection (normally carried out every 5 or 10 years).
- *Administrative records*, such as social security and tax registers. These are the main sources of information for adjusting data from labour force surveys and establishment surveys to obtain estimates of absences from work due to illness, maternity leave, occupational injuries, strikes and lockouts.
- *Time Use Surveys*. These are useful to compare the results from other sources but their irregularity, low frequency and limited international comparability is a drawback. Labour force survey based estimates of working time typically over-report hours worked when compared with estimates from time use surveys.

For the purposes of productivity analysis, consistency of LFS based data on hours worked with *National Accounts* concepts needs to be ensured (OECD, 2009; Ypma and van Ark, 2006). This implies adjusting the coverage of activities included in the LFS to that used to compute GDP, and

adapting the geographical and economic boundaries of employment to GDP. The notion of economic territory used to compute GDP refers to the domestic concept, i.e. resident persons working outside the country are excluded. Some of these adjustments can be considered as negligible for most countries although they are made in all countries. Likewise, measures of hours actually worked should refer to productive activities within the SNA production boundaries (by definition); persons spending time on productive activities excluded from the original sources should therefore be included.

In general, when LFS is the main source of information for employment, adjustments concern persons outside the LFS universe but who need to be included as persons engaged in production, as defined in the SNA. The causes for differences between these two measures are:

- age threshold: for example, people under 15 engaged in production are generally not included in LFS estimates;
- non-coverage of particular groups: persons living in collective households, armed forces, and non-resident persons working within the economic territory of the country are generally not surveyed in LFSs;
- non-coverage of certain activities: the LFS may not include hours worked in certain activities such as subsistence work and volunteer work;
- non-coverage of some territories: the LFS may not cover the entire economic territory covered in GDP.

Table 7.2 describes the main strengths and limitations of the primary sources typically used to compute hours worked and employment estimates in national accounts.

Table 7.2. 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

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In practice, the effective quantity of labour input depends not only on the total number of hours actually worked but also on the characteristics of those performing the work, like education, working experience, business function and sex. The measure of labour input used in this publication, i.e. total number of hours worked, does not account for the composition or heterogeneity of the labour force, thus ignoring changes in the quality of labour (i.e. human capital). This implies treating workers as perfect substitutes: an hour worked by a highly-experienced surgeon and an hour worked by an eighteen-year old student employed in a fast-food are treated as equal amounts of labour. Unadjusted measures of labour input, i.e. total number of hours worked, underestimate the effective use of labour in production affecting cross-country comparability.

Hours worked data in the OECD Productivity Statistics (database) (PDB)

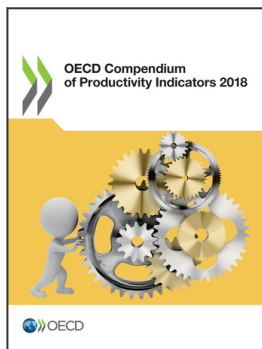
In the PDB, the main requirement is that the most internationally comparable hours worked data are used (OECD, 2007). The preferred source for total hours worked is *National Accounts*, which are presented in the *OECD National Accounts Statistics* (database), both for the total economy and for aggregate 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 35 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, Austria, Belgium, Canada, Costa Rica, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, the United Kingdom 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.
- 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.

Further reading

- Ahmad, N., et al. (2003), “Comparing Labour Productivity Growth in the OECD Area: The Role of Measurement”, *OECD Science, Technology and Industry Working Papers*, No. 2003/14, <http://dx.doi.org/10.1787/126534183836>.
- ILO (2008), *Measurement of working time*, 18th ICLS.
- OECD (2007), “Factors explaining differences in hours worked across OECD countries”, *Document prepared for the Working Party No. 1 on Macroeconomic and Structural Policy Analysis*, September 2007.
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- Ypma, G. and B. Van Ark (2006), “Employment and Hours Worked in National Accounts: A Producer’s View on Methods and a User’s View on Applicability”, *EU KLEMS Working Paper* No. 10.



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