

INTERNATIONAL COMPARABILITY OF OECD MEASURES OF ANNUAL HOURS WORKED¹

(Updated on 20 July 2017)

According to the 2008 System of National Accounts (2008 SNA), total hours actually worked is the preferred aggregate measure of labour input for productivity analysis, as it reflects the volume of work engaged per year in self-employment and employee jobs for the production of goods and services by resident units of production. In practice, total hours of work are derived from combining available estimates of annual hours actually worked per person in employment with average employment levels over the year from OECD databases that are coherent with the hours worked figures. In general, the international comparability of employment levels and trends is ensured by their compliance to ILO guidelines on employment statistics² (ICLS, 2013), while ensuring that they match the coverage of production in the SNA. They are therefore less prone to important conceptual differences³ compared to the measurement issues that affect estimates of hours worked.

Current situation and the international comparability of working time estimates

Estimates of average hours actually worked per year per person in employment are currently available on an annual basis for all 35 OECD countries (See OECD Employment Outlook, Statistical Annex Table L). These estimates are available from National Statistical Offices for 35 countries, 25 of which are reported in the OECD National Accounts questionnaire and should normally be consistent with National Accounts concepts and coverage. Estimates for two other countries - Japan and the United Kingdom - are produced by the OECD.

Table 1 provides an overview of data sources and methods underlying national estimates of annual working time. National Accounts estimates for 13 (out of 25) countries rely fully on labour force survey (LFS) results and in 10 countries annual working hours are derived using a direct method, which consists of annualising average actual weekly hours worked derived from continuous surveys in all weeks of the calendar year (i.e. average actual weekly hours worked - including full- and part-week absences and extra

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1. This summary is based on OECD (2003) and OECD (2004) updated with information available from the collection of annual working time estimates as at 20 July 2017.
 2. However, many employment estimates are derived from labour force surveys, which are limited to resident population and do not cover, in a number of cases, people living in institutions, collective households, armed forces and people below or above a certain age limit. Thus, employment estimates do not cover cross border workers, while expressed on a worker basis, which makes up for most of the difference with National Accounts coverage, albeit only in countries where these features are prevalent. Lastly, labour force survey based employment estimates are benchmarked to population censuses, which are only conducted every 5 to 10 years.
 3. OECD (2009) provides a summary of national practices to ensure consistency of labour input measures with national accounts concepts and concludes that (i) the implementation of adjustments to domestic concepts vary across countries and (ii) incomplete adjustments are more common for hours worked than for employment.

hours worked in the main or additional jobs - times 52 weeks). Data on annual working time for the remaining 12 countries from the National Accounts data collection are based on a combination of data sources extending administrative or establishment survey sources for hours worked per employee with LFS data on hours worked for the self-employed and other employees and/or industries excluded from the primary sources. Another annual questionnaire on labour force statistics compiles data on annual hours worked for the remaining 10 OECD countries, of which 8 countries rely on a direct method using LFS-based weekly actual hours worked. In sum, annual hours worked are derived from a direct method using LFS data in 18 countries. For labour force surveys with fixed monthly reference weeks, this method results in averaging hours worked during 12 weeks in the year, which requires further adjustments for special events, such as holidays, falling outside the reference week (i.e. Australia and Canada).

Table 1: Measures of annual working time and employment included in the OECD Productivity Database

	<i>Annual hours actually worked per worker</i>		<i>OECD source for employment estimates¹</i>
	<i>Source</i>	<i>Method</i>	
Australia	Labour Force Survey	Direct (adjusted for working days)	Annual National Accounts
Austria	Administrative source (National Accounts)	Direct	Annual National Accounts
Belgium	Administrative source (National Accounts)	Direct	Annual National Accounts
Canada	Labour Force Survey (National Accounts)	Direct (adjusted for working days)	Annual National Accounts
Chile	Labour Force Survey	Direct	Annual National Accounts
Czech Republic	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Denmark	Establishment Survey/Labour Force Survey (National Accounts/Working Time Account)	Component	Annual National Accounts
Estonia	Labour Force Survey		Annual National Accounts
Finland	Establishment Survey/Labour Force Survey (National Accounts)	Direct	Annual National Accounts
France	Administrative/Establishment Survey (National Accounts)	Component	Annual National Accounts
Germany	Administrative source (National Accounts)	Component	Annual National Accounts
Greece	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Hungary	Establishment Survey/Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Iceland	Labour Force Survey	Direct	Annual National Accounts
Ireland	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Israel	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Italy	Administrative/Labour force survey Survey (National Accounts)	Component	Annual National Accounts
Japan	Establishment Survey/Labour Force Survey	Component	Annual National Accounts
Korea	Establishment Survey/Labour Force Survey (National Accounts)	Component	Annual National Accounts
Latvia	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Luxembourg	Administrative/Labour force survey Survey (National Accounts)	Direct	Annual National Accounts
Mexico	Labour Force Survey	Direct	Annual National Accounts
Netherlands	Establishment Survey/Labour Force Survey (National Accounts/Labour Account)	Component	Annual National Accounts
New Zealand	Labour Force Survey	Direct	Annual National Accounts
Norway	Establishment Survey/Labour Force Survey (National Accounts)	Component	Annual National Accounts
Poland	Labour Force Survey	Direct	Annual National Accounts
Portugal	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Slovak Republic	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Slovenia	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Spain	Labour Force Survey/Establishment survey (National Accounts)	Partially direct	Annual National Accounts
Sweden	Establishment Survey/Labour Force Survey (National Accounts)	Direct	Annual National Accounts
Switzerland	Labour Force Survey (National Accounts)	Component	Annual National Accounts
Turkey	Labour Force Survey (National Accounts)	Direct	Annual National Accounts
United Kingdom	Labour Force Survey	Direct	Annual National Accounts
United States	Establishment Survey/CPS (Office of Productivity and Technology)	Component	Annual National Accounts

1) Employment estimates from the Annual National Accounts refer to domestic concept.

Source: OECD Employment Outlook, Statistical Annex, Table L (<http://www.oecd.org/els/emp/employment-outlook-statistical-annex.htm>).

Overall, 17 countries use a component method of accounting time actually spent on work activities. This is based on a variety of sources for worker categories, industries and institutional sectors that enable to capture different components of variation from a usual or normal working hour benchmark (*e.g.* public holidays, annual leave, overtime, absences from work due to illness and to maternity, *etc.*). For instance, actual hours may be derived from hours paid in establishment surveys for production and non-supervisory workers and from hours worked in labour force surveys (LFS) for the self-employed, managers and supervisory workers, farm workers and employees in the public sector. Hours not worked due to sickness absences are estimated from the number of days not worked from social security registers or health surveys in certain countries. Bank holidays and annual leave are either derived from establishment data on paid leave or from the number of days of statutory leave entitlements (assuming workers do not work at all during public holidays and annual leaves). In France, Germany and Switzerland, the measurement of annual working time rely on this component method, as well as to certain extent Secretariat estimates for Japan and those produced recently by Statistics Korea for Korea using the same methodology as for Japan. Estimates of hours worked per worker for the United States are derived by complementing hours at work reported in Current Employment Statistics (CES), an establishment survey, with hours worked from Current Population Survey (CPS) and other sources for worker categories and industries not covered by CES. In sum, annual hours worked are derived from the product of weekly hours worked benchmark (*i.e.* usual or normal hours worked in all jobs) and the number of weeks actually worked during the calendar year⁴.

Two other considerations should be born in mind. First, annual working time measures are reported either on a job or on a worker basis. To harmonise the presentation, annual hours worked measures are expressed either on one or the other measurement unit by using the share of multiple job holders in total employment, which is available in labour force surveys, albeit no further distinction is possible between second and more jobs⁵.

Second, given the variety of data sources, of hours worked concepts retained in data sources, and of measurement methodologies (direct measures or component methods⁶) to produce estimates of annual working time, the quality and comparability of annual hours worked estimates are constantly questioned, and are subject to at least two probing issues:

- Labour force survey based estimates are suspect of over-reporting hours worked compared to work hours reported in time use surveys, in particular for those working long hours, like managers and professionals.
- Employer survey based estimates do not account for unpaid overtime hours and are sometime suspect of under-reporting hours worked with consequences on productivity levels and growth (Eldridge et al. (2003)).

4. Finally, estimates of annual working time for dependent employees for 7 EU member states – Austria, Estonia, Greece, Ireland, Latvia, Portugal and the Slovak Republic - are produced by the OECD Secretariat applying a variant of the component method to the results of the European Labour Force Survey (EULFS): <http://www.oecd.org/employment/emp/ANNUAL-HOURS-WORKED.pdf>.

5. For example, the BLS-Office of Productivity and Technology (OPT) estimates of annual hours of work for the United States are reported on a (per) job basis and are later converted by the OECD Secretariat to a per worker basis by multiplying the job based annual hours of work by (1 + CPS based share of multiple jobholders in total employment). This conversion from hours per job to hours per worker is also done for Swiss estimates of annual working time, while this is not done for Canadian estimates.

6. However, both methods can be summarised by the following identity: Annual hours per worker = Standard weekly hours worked in all jobs x Number of weeks actually worked over the year = Weekly hours actually worked in all jobs x 52 weeks, considering weekly reference period for reporting hours worked.

Current practices and evidence on key measurement issues

Countries with a long practice in producing aggregate and industry level measures of annual hours of work revise periodically their measurement methodologies to achieve complete and adequate coverage of workers to conform to National Accounts output measures. For example, the Office of Productivity and Technology (OPT) of the Bureau of Labor Statistics in the United States undertook studies to improve the estimation of hours worked of worker categories not covered by the establishment survey – the Current Employment Statistics (CES) -, which is the main source for annual hours worked measures⁷. Germany revised annual working time series to better account for workers with few hours of work, which resulted in a decrease in aggregate hours; France undertook a revision of series previously published to account for a change in hours worked concepts following the introduction of working time reduction in 1999. Short periods of rest at the workplace (or work breaks) are no longer counted as hours worked, which however departs from ILO recommendations, and resulted in a decrease in working time over the period 1990 to 1999 compared to previous series of around 40 hours per year. In light of all these developments, it is necessary to have a more complete documentation of measurement methodologies, in terms of hours concepts retained in data collections, methods used to derive annual hours of work, and worker coverage limitations, to understand the strengths and weaknesses of current measures and to work on improving the quality of hours worked measures.

On the other hand, annual hours worked measures rely mainly on labour force survey results for a large number of countries. Indeed, in a majority of countries labour force surveys are the only source available to derive annual hours of work measures. This source has the advantage of covering all workers⁸. But, the reporting of actual hours worked is suspect to be less accurate than those recorded by employers for the same workers. Therefore, the quality of annual hours actually worked requires a proper assessment of the main sources of variation from standard working time, that is, usual or normal weekly hours of work reported in labour force surveys. Working time components should then be confronted to external sources – time use surveys, health surveys, establishment surveys, social security registers, and other sources.

So far, some results of data confrontation undertaken for a limited number of countries (OECD 1998b) highlighted the following results:

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7. The question of quality of annual hours worked measures is best addressed by countries themselves. In the United States, official estimates of annual hours worked are mainly based on estimates of weekly paid hours worked by employees recorded in the Current Employment Statistics (CES), a monthly employer survey of non-farm establishments. Hours paid are later converted into hours worked using the Hours at Work Survey (HWS) until year 2000 and since then the National Compensation Survey program. However, the survey covers only production workers in goods producing industries (i.e. manufacturing) and non-supervisory workers in services producing industries. The Current Population Survey, a monthly household survey, and other sources are used to derive hours worked by workers not covered by CES, apart from non-production workers and supervisory workers in goods and services producing industries. For the latter two categories of employees, official estimates of annual hours worked assume that the average weekly hours of work of non-production and supervisory workers are the same as those of production and non-supervisory workers. A recent study wanted to test this assumption and built a CPS-adjusted series of average weekly hours worked for non-production and supervisory workers to derive a new total hours worked series for the non-farm business sector. Official estimates and the new hour series showed similar trends, but the latter series and adjustments, based on survey evidences, are expected to replace current series, which are based on assumptions (See Eldridge *et al.*, 2003).
 8. Apart from workers excluded from the scope of the surveys like geographical, institutional, collective households and age exclusions.

- "Standard" hours of work from establishment-based surveys and labour force surveys (LFS) differ by 1 to 3 % for the four countries (France, Germany, Netherlands and Switzerland) included in the analysis, with labour force surveys yielding the higher estimates (OECD, 2008).
- Actual hours worked per week from labour force surveys conducted on a continuous basis during all weeks of either all months or quarters of the year are likely to underestimate absences from work due to public holidays and annual leave in a number of countries. This is the main factor of upward bias of LFS-based annual hours worked estimates derived from a direct method of annualisation of weekly actual hours worked (Körner *et al.*, 2016). Usual hours worked per week are less affected by reporting errors and can be used as a benchmark for deriving annual working time estimates.
- Monthly labour force survey estimates of hours not worked due to holidays, even when adjusted for the irregular occurrence of holidays during the reference week, seem to be downward biased (Canada).
- Estimates of hours lost due to illness, work accidents and maternity leave from labour force surveys appear to be underestimated by about 45% to 60% compared to administrative sources (in France, Germany and Switzerland). These seem to be associated largely with a serious underreporting of part-week absences (OECD, 1998).
- Labour force surveys seem also to underestimate overtime work (e.g., Germany). However, this is not entirely certain, because some regularly occurring overtime may be included in usual hours of work in labour force surveys.
- Finally, in the aggregate, empirical results from 2 countries (Germany and the United States) suggest that labour force survey estimates yield figures for annual hours of work that are only somewhat higher than those from establishment surveys (OECD, 1998). This is due in part to the fact that biases in estimates of components of working time tend to cancel out to a certain extent. Note, however, that such relatively close agreement is not found everywhere.

A second study (OECD, 1999) examined the effect of so-called "unpaid overtime" worked by managers and professionals on the estimates of annual working time from labour force surveys relative to those from administrative or establishment survey sources. That is, the additional hours worked by managers and professionals, over and above those worked by full-timers in other occupations. The impact of this "unpaid overtime" recorded in labour force surveys varied by country from as little as no measurable effect to as much as 40 hours per year, depending on the country.

This partial evidence suggests, however, that the comparability of labour force survey based estimates are likely to be enhanced when adjusting for obvious underestimation of main reasons of absences, that are, public holidays, paid annual leave, and sickness and maternity leave, while estimates of unpaid overtime captured by labour force surveys seem to have a limited impact on non-LFS based annual working time measures, at least at an aggregate total economy level. As a result, OECD Secretariat estimates of annual working time for certain European countries based on the European Labour Force Survey (EULFS) are adjusted, first, by doubling hours lost due to sickness absence and maternity leave reported in labour force surveys. Second, holidays and annual leave entitlements are taken from external sources assuming that all workers are entitled to annual leave and take all days off over the year. These estimates of annual working time can be used to assess cross-country comparability of national estimates of annual hours worked (OECD, 2004).

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