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COMPARABILITY OF LABOUR INPUT MEASURES FOR PRODUCTIVITY ANALYSIS

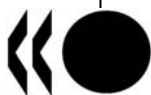
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This paper has been prepared by Olivier Brunet and Eun-Pyo Hong, OECD and will be presented under item 5 of the draft agenda

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COMPARABILITY OF LABOUR INPUT MEASURES FOR PRODUCTIVITY ANALYSIS¹

Abstract

This paper presents the methods and procedures adopted by EU and OECD Members countries to harmonise and align measures of labour input in their accounts, based on the results of a recent joint OECD/Eurostat Survey. A synthesis of the results of the survey reveals that there are still significant differences in national practices; reflecting in part the heterogeneous nature of labour data sources used by countries in practice (e.g. Labour Force Surveys, Administrative Sources, Business Statistics and Population Census). Clearly this heterogeneity impacts on the comparability of labour input statistics but it also impacts on productivity comparisons and highlights the need for continued improvements, at the national level, in this area.

¹ The authors would like to express special thanks to Bart Van Ark and Gerard Ypma, who were the authors of the first version of this paper (i.e. Employment and Hours Worked in National Accounts: A Producer's View on Methods and a User's View on Applicability). Acknowledgements are also due to Jukka Jalava, Jenny Runesson and Christine Gerstberger from Eurostat for their invaluable assistance in the collection of questionnaires from EU countries, Iceland, Norway and Switzerland.

1. Introduction

1. At the OECD Working Party of National Accounts (WPNA) meeting in October 2004, the OECD Statistics Directorate (STD) presented a report [Lequiller (2004)] identifying considerable differences in the sources of data used, and indeed the coverage of activities and persons, in national estimates of annual hours worked per person or per job.

2. Recognising the importance of comparability in this area, particularly reflecting the importance of labour input measures in calculations of productivity, in late 2004, the OECD and Eurostat launched a survey to collect data and metadata on labour input, (employment and hours worked). All OECD countries (except Turkey) and eight non-OECD European Union (EU) Member countries responded.

3. An update to this survey has recently been conducted (in the first half of 2009). All OECD EU Member countries plus Iceland, Norway and Switzerland (of which 22 OECD Member countries, and Estonia and Slovenia being the two OECD Accession countries) were surveyed by Eurostat, while the remaining non-EU OECD member countries plus Chile, Israel and the Russian Federation (Russia) as non EU accession countries to the OECD were surveyed by the OECD. The 2009 survey was little changed from the 2004 version.

4. This paper presents the results of the second joint survey and summarises improvements and changes made by countries over the last five years. It also analyses the importance of adjustments in terms of labour productivity.

5. The paper begins with an overview of the recommendations from the 2004 WPNA. The following section presents a summary of the 2009 survey results and provides further details relating to cross-country differences and details changes in national practices that have arisen since 2004. Finally for illustration, section 4 presents the impact on labour productivity estimates in Spain, Austria and Finland when adjustments are made to harmonize both the coverage and underlying concept of labour input measures. The annex contains the joint OECD/Eurostat questionnaire used in the 2009 survey, the table 0303 of the OECD/Eurostat questionnaire, some terminology and definitions of employment, hours worked and other variables and, finally, the current situation on hours worked in OECD domain.

2. Recommendations from the 2004 WPNA

6. In order to enhance the quality and comparability of labour input data, delegates attending the 2004 OECD WPNA meeting recommended the following:

1. Use national accounts sources for the denominator of the measure of labour productivity, in order to ensure consistency with the numerator.
2. Report systematically total hours worked for employees and self-employed in the format of Table 0303 of the OECD/Eurostat questionnaire (attached as an appendix to the present document).
3. Countries unable to transmit these data should explain the reasons they are unable to do so.
4. Countries should transmit metadata quantifying the bridge table between original Labour Force Statistics (LFS) and National Accounts Data.

7. The OECD and Eurostat conducted the first joint survey in late 2004 following the recommendation from the WPNA. The results of the survey were summarized in Lequiller (2005) and Ypma and van Ark (2006).

3. 2009 survey

3.1. *Survey objectives, contents and procedures*

8. The 2004 survey revealed that differences in the average number of hours worked (per person or per job) across OECD countries are substantial. There are also large differences in labour productivity between countries at a similar stage of development. The reasons for such differences are not fully understood, and that a large part of these differences could be explained by differences in concepts. The 2009 survey was launched largely to determine whether these differences remained.

9. The 2009 questionnaire is divided into two complementary parts. The first part aims to assess the availability of hours worked for the total economy. The second part is intended to gain a better understanding of the sources and methods used to derive estimates of employment and hours worked. This description is both quantitative (described in bridge tables, see Annex 1) and qualitative (based on a general description of employment and hours worked original data source(s)).

10. As in the case of the 2004 survey, the survey was conducted jointly by the OECD Secretariat (OECD) and Eurostat. All 27 EU Member countries plus Iceland, Norway and Switzerland were surveyed by Eurostat. The OECD covered the remaining OECD Members, i.e. Australia, Canada, Japan, Korea, Mexico, New Zealand, Turkey and the United States, and the three non-EU accession countries, i.e. Chile, Israel and Russia. Overall, 41 countries are covered in the 2009 survey².

11. The OECD carried out the survey during the first quarter of 2009 and Eurostat during the second quarter of the same year. The results are shown in the section below. Eurostat received replies from all countries except Bulgaria and Luxembourg. For the countries which have not answered, results of the 2004 survey are presented.

3.2. *Results of the 2009 survey*

12. This section begins with an overview of the various data sources used by countries and their importance (Main and Other) in the construction of estimates of employment and hours worked (Box 1). A source described as 'main' refers to an important source for both indicators. A source described as 'other' means that this source is used as a complementary source to the main source(s).

13. It goes on to describe the nature of adjustments made by national statistical offices to the employment and the hours worked data from the original data sources to comply with national accounts concepts³.

² 37 countries were covered in the 2004 survey.

³ Detailed information by country is not contained in this document but rather in a separate annex that is available from the authors on demand.

3.2.1. Sources

Box 1: Sources for information on employment and hours worked

In practice countries use four categories of primary sources: Labour Force Surveys, Population Censuses, Business Surveys, and Administrative Sources. The first two can be typified as ‘supply-side’ and the latter two ‘demand-side’.

Labour Force Survey (LFS): The LFS is the most comprehensive and well-established source providing reliable information on the composition and characteristics of the labour force. International harmonization of concepts is achieved by complying definitions set by the ILO. Sample size and survey techniques may however differ substantially between countries.

The advantages are that the LFS covers the whole population. The LFS also gives information on self-employed and informal employment; and on persons, jobs, hours worked as well as information on the structure of employment in terms of age, gender, education level and professional situation.

The disadvantages of the LFS are that the LFS, by definition, surveys residents instead of the domestic labour force which is not consistent with the 1993 SNA data and does not cover some groups such as those working in communal establishments, the illegal economy and the armed forces.

Population Census (PC): PC covers the whole population and is often used as a benchmark for most household surveys including LFS. Hence, it also describes the domestic labour force. The main disadvantage is the low frequency of data collection (normally carried out every five or 10 years).

Business survey (BS): BS includes establishment or enterprise surveys, business census, and dedicated labour cost surveys. BS typically provide detailed data on employment and hours worked and the information is generally consistent with output data but they often suffer from thresholds which mean that only businesses of a certain size are enumerated – this is especially relevant for economies with a sizeable self-employed workforce. Moreover BSs have to be used in combination with other data sources as they usually measure only jobs, and not full-time equivalents or hours worked say.

Administrative source (AS): AS, such as social security and tax registers, provide data on compensation and income but in practice several adjustments are required to estimate employment on a national accounts basis, particularly when one considers the informal economy.

3.2.1.1. Employment

14. Table 1 below presents information on the original data sources used for employment (employees and self-employed). Sources are distinguished between Main sources and Other sources. When a country uses a single data source, this source is classified as Main. But, in most cases, countries use different original data sources to compile employment. In these cases, at least one source is classified as Main. In some countries, it is possible to get two Main sources which means that these two sources are important and complementary in the compilation of employment. For example, this is the case for countries basing their calculation on PC, which is combined with at least another source classified as Main.

15. The table also indicates whether the country provides data referring to jobs and/or persons. Finally, the table distinguishes between OECD countries and other countries, the latter category includes OECD Accession countries (i.e. Chile, Estonia, Israel, Russia and Slovenia) and the remaining non-OECD EU countries (Bulgaria, Cyprus, Latvia, Lithuania, Malta and Romania).

Table 1: Original data sources for Employment

	Unit	Employees				Self-employed			
		LFS	PC	BS	AS	LFS	PC	BS	AS
OECD countries									
Australia	Persons	Main	-	-	Other	Main	-	-	Other
Austria	Persons / Jobs	Other	-	Main	Main	Main	-	-	-
Belgium	Persons	-	-	-	Main	-	-	-	Main
Canada (1)	Jobs	Main	-	Other	-	Main	-	-	-
Czech republic	Persons / Jobs	-	-	Main	Other	-	-	Main	-
Denmark	Persons	Other	-	Other	Main	Other	-	Other	Main
Finland	Persons	Main	-	Other	Other	Main	-	Other	Other
France	Persons	Other	Main	Main	Other	Other	-	Main	Other
Germany	Persons	Other	-	Other	Main	Main	-	-	-
Greece	Persons	Main	-	Other	Other	Main	-	Other	Other
Hungary	Persons	Main	Other	Other	Other	Main	Other	Other	Other
Iceland	Persons	-	-	-	Main	-	-	-	Main
Ireland	Persons	Main	Other	Other	-	Main	Other	Other	-
Italy	Persons / Jobs	Other	Main	Main	Other	Other	Main	Main	Other
Japan	Jobs	Main	Main	-	-	Main	Main	-	-
Korea	Persons	Main	-	-	-	Main	-	-	-
Luxembourg (1)	Persons	-	-	Main	Main	-	-	Main	Main
Mexico	Jobs	-	-	Main	Main	n.c.	n.c.	n.c.	n.c.
Netherlands	Persons	Other	-	Other	Main	Main	-	-	-
New Zealand	Persons / Jobs	Main	-	Other	-	Main	-	-	-
Norway	Persons / Jobs	Main	-	-	Other	Main	-	-	-
Poland	Persons	Main	-	Other	-	Main	-	-	-
Portugal	Persons	Main	Other	Other	Other	Main	-	-	-
Slovak republic	Persons	Other	-	Main	Other	Main	-	-	Main
Spain	Persons / Jobs	Main	-	Main	Other	Main	-	Main	Other
Sweden	Persons	Main	-	Main	Other	Main	-	Main	Other
Switzerland	Persons / Jobs	Main	-	Other	Other	Main	-	Other	Other
United Kingdom	Persons / Jobs	Main	-	Other	-	Main	-	-	-
United States	Jobs	Other	-	Main	Other	Other	-	Main	Other
Other countries (OECD Accession Countries and Non-OECD EU countries)									
Bulgaria (1)	Persons	Main	-	Main	-	Main	-	-	-
Chile	Persons	Main	-	Other	Other	Main	-	Other	Other
Cyprus	Persons	Main	-	Other	Other	Main	-	-	-
Estonia	Persons	Main	-	-	-	Main	-	-	-
Israel	Persons	Main	-	-	Other	Main	-	-	Other
Latvia	Persons	Main	-	Other	Other	Main	-	-	-
Lithuania	Persons	Main	-	-	Other	Main	-	-	-
Malta	Persons / Jobs	Other	-	Main	Main	Other	-	Main	Main
Romania	Persons / Jobs	Main	-	Other	Other	Main	-	Other	-
Russia	Jobs	-	-	Main	-	-	-	Main	-
Slovenia	Persons	Other	-	-	Main	Other	-	-	Main

(1) 2004 survey results; n.c.: Data not yet compiled by the country.

16. The table shows that most countries compile employment data in terms of persons or in terms of both persons and jobs. Only Canada, Japan, Mexico, Russia and the United States publish employment data referring to jobs. Compared to the 2004 survey, Austria, Greece and Switzerland have now moved

from jobs to persons. Most countries rely on LFS as their original source. PC is the primary source for France, Italy and Japan, France and Italy having 5-year censuses whereas Japan runs an annual census.

17. All countries except Belgium, the Czech Republic, Iceland, Luxembourg, Mexico and Russia use LFS for the compilation of their employment data, either as the only main source or as a secondary source. When LFS is used as their main source, more than half of the countries supplement it with the BS and/or AS. Only Estonia and Korea use the LFS as their only source. France and Italy use the BS and PC as the main sources and LFS as other source. Japan uses LFS and PC as main sources. PC is used as a benchmark for population and employment in all these countries. Hungary, Ireland and Portugal, on the other hand, use PC as a secondary source and LFS as the main source.

18. Some countries use LFS as a main source but also use BS and/or AS for minor adjustments, especially for economic territory adjustments (Australia, Estonia, Hungary, Israel, Japan, Lithuania, Norway, Poland and Switzerland), or for the compilation of industry-level employment data (Canada, Chile, Cyprus, Ireland, Latvia, New Zealand, Portugal, Romania, and the United Kingdom).

19. Other countries such as Bulgaria, Finland, Greece, Spain and Sweden still use LFS as a main source but complement it with other sources (administrative and/or business sources) that provide more industry details and have a better coverage. These countries use LFS data at the industry level but replace them by other sources when they are more reliable.

20. Some countries mainly focus on demand-based sources, (BS and AS) with the LFS used as a supplementary source to capture for example the self-employed, or to make adjustments to the domestic employment concept and for quarterly trends. This is the case for Austria, Denmark, France, Germany, Italy, Malta, the Netherlands, the Slovak Republic, Slovenia and the United States.

21. Belgium, the Czech Republic, Iceland, Luxembourg, Mexico and Russia only rely on labour demand sources. These countries use administrative sources for their employment estimations. Belgium and Iceland compile employment data using only administrative sources. Moreover, there are also differences in sources between employees and self-employed. Most countries rely on LFS as a main or secondary source to compile self-employed data.

3.2.1.2. Hours worked

22. Table 2 presents the original data sources used for estimates of hours worked (for both employees and self-employed).

23. Iceland, Malta, Mexico, Slovenia, Turkey, and the United Kingdom do not currently compile data on hours worked for both employees and self-employed. For Australia, Belgium and Japan, hours worked are only available for employees. Belgium should provide their first estimates of hours worked of the self-employed in 2010.

24. There are two approaches for compiling data on total hours worked. First, the actual hours per week are multiplied by the number of weeks in a year and then are adjusted for public holidays falling outside the reference week. These direct measures of actual hours figures are provided by LFS and some establishment surveys but the latter is not always consistent with the ILO guidelines. Second, the contractual hours per week from establishment surveys or administrative sources are adjusted for absences (holidays etc) and overtime. This component method is especially used by countries working with labour and time use accounts.

25. 28 countries use LFS either as a primary (24 countries) or secondary source (i.e. France, Germany, Italy and Japan) for hours worked of employees. Among the remaining 13 countries, seven countries (i.e. Belgium, Denmark, Luxembourg, the Netherlands, Russia, the Slovak Republic, and the United States) do not use LFS as a source.

26. Some countries do not use LFS as their main source for compiling hours worked. They usually take contractual hours or paid hours as a starting point. Then, they correct these hours taking into account absences and overtime (these indicators are included in the LFS). Luxembourg and the United States use the level of paid hours as a basis whereas Italy, the Netherlands and Norway take contractual hours as a starting point. The French and German approaches start respectively with normal weekly hours and potential working days.

27. For self-employed, Luxembourg and Russia do not use LFS for the compilation of hours worked and France uses LFS as a secondary source. For the remaining countries, LFS is the main source. When LFS is the main source, Norway, Romania and Sweden use other source(s) to supplement information to compile hours worked for self-employed. Australia, Belgium and Japan do not compile hours worked for self-employed.

Table 2: Original data sources for Hours worked

	Employees				Self-employed			
	LFS	PC	BS	AS	LFS	PC	BS	AS
OECD countries								
Australia	Main	-	-	-	n.c.	n.c.	n.c.	n.c.
Austria	Main	-	Main	-	Main	-	-	-
Belgium	-	-	-	Main	n.c.	n.c.	n.c.	n.c.
Canada (1)	Main	-	-	-	Main	-	-	-
Czech republic	Main	-	-	-	Main	-	-	-
Denmark	-	-	Other	Main	Main	-	-	-
Finland	Main	-	-	-	Main	-	-	-
France	Other	Main	Main	Other	Other	Main	Main	Other
Germany	Other	-	Other	Main	Main	-	-	-
Greece	Main	-	-	-	Main	-	-	-
Hungary	Main	-	-	-	Main	-	-	-
Ireland	Main	-	-	-	Main	-	-	-
Italy	Other	-	Main	-	Main	-	-	-
Japan	Other	-	Main	-	n.c.	n.c.	n.c.	n.c.
Korea	Main	-	-	-	Main	-	-	-
Luxembourg (1)	-	-	Main	Main	-	-	Main	Main
Netherlands	-	-	Other	Main	Main	-	-	-
New Zealand	Main	-	-	-	Main	-	-	-
Norway	Main	-	-	-	Main	-	-	-
Poland	Main	-	-	-	Main	-	-	-
Portugal	Main	-	-	Main	Main	-	-	-
Slovak republic	-	-	Main	-	Main	-	-	-
Spain	Main	-	Main	-	Main	-	-	-
Sweden	Main	-	Main	Other	Main	-	-	Other
Switzerland	Main	-	-	-	Main	-	-	-
United States	-	-	Main	-	-	-	Main	-
Other countries (OECD Accession Countries and Non-OECD EU countries)								
Bulgaria (1)	Main	-	Main	-	Main	-	-	-
Chile	Main	-	Other	Other	Main	-	Other	Other
Cyprus	Main	-	Other	-	Main	-	-	-
Estonia	Main	-	-	-	Main	-	-	-
Israel	Main	-	-	-	Main	-	-	-
Latvia	Main	-	-	-	Main	-	-	-
Lithuania	Main	-	-	-	Main	-	-	-
Romania	Main	-	Other	-	Main	-	Other	-
Russia	-	-	Main	-	-	-	Main	-

(1) 2004 survey results; n.c.: Data not yet compiled by the country.

As can be seen from both tables 1 and 2, some countries use different sources for employment and hours worked. This is due to the fact that the typical sources used for the compilation of employment (usually administration data or population census) do not provide information for the estimation of hours worked.).

3.2.2. *Bridging source data and the national accounts*

3.2.2.1. Employment

28. Depending on the nature of employment data in the original data sources, adjustments have to be made to conform to the 1993 SNA. Table 3 summarises the impact in percentage of various adjustments applied to the figures in the primary source. Adjustments have been divided into five categories, adjustments:

- for the calculation of annual estimates;
- from jobs to persons (or vice versa);
- for the economic territory;
- for the underground economy;
- and other kinds of adjustments.

29. The adjustments reveal that employment increases in 28 countries, decreases in 6, and no adjustments are applied in two countries (i.e. Chile and Korea). Most of the adjustments come from the economic territory adjustment. Very few adjustments are compiled for the calculation of annual data as most countries do not need to make this adjustment nor for the adjustment from jobs to persons as most countries already produce employment data in persons.

Adjustments for the calculation of annual estimates

30. Annual data are mostly calculated as an average of quarterly figures and quarterly figures are calculated as an average of monthly or weekly figures. This adjustment is used by countries which base their quarterly data on annual levels of the preceding year. Hence when the sources of the annual figures appear only once a year, the quarterly figures are adjusted after the calculation of the final annual figures. When a country does not follow this rule, an adjustment should be made from the original stock data to estimate flow data. Only Belgium, Cyprus, France, Ireland, Italy and Japan make this adjustment and for the latter two countries, the impact of the adjustment is quite important, respectively -0.8% and -1.4%. Moreover, only Iceland does not compile quarterly national accounts estimates.

Jobs versus persons

31. The impact of adjustments to employment data due to the conversion from persons to jobs is positive and non-negligible in Canada (+4.9%), Japan (+3.8%) and New Zealand (+4.2%). For the Czech Republic, the impact of this adjustment is negative as the conversion is made from jobs to persons.

Table 3: Effect of adjustments to comply with 1993 SNA/1995 ESA concepts on employment

	Period	Total (%)	Annual / Quarterly averages (%)	Persons-jobs (%)	Economic territory (%)	Unobserved Economy (%)	Other adjustments (%)
OECD countries							
Australia	Jun-08	0.5	n.a.	n.a.	0.5	-	-
Austria	2008	0.7	n.a.	n.a.	0.6	2.4	-2.3
Belgium (1)	2004	0.7	-0.1	n.a.	0.9	1.7	-1.9
Canada (1)	1999	2.2	n.a.	4.9	1.2	-	-3.8
Czech republic	2004	3.4	n.a.	(3)	(3)	(3)	(3)
Denmark	2005	2.1	n.a.	n.a.	1.2 (2)	0.9 (2)	0.0
Finland	2008	0.1	n.a.	n.a.	0.8	-	-0.7
France	2007	-0.8	0.2	n.a.	-1.1	-	0.1
Germany	2008	3.7	n.a.	n.a.	1.2	2.3	0.2
Greece	2004	4.4	n.a.	n.a.	(3)	(3)	(3)
Hungary	2007	6.5	n.a.	n.a.	2.1	3.6	0.8
Iceland	-	-	n.a.	n.a.	-	-	-
Ireland	2008	0.2	0.2	n.a.	0.0	-	-
Italy	2001	7.5	-0.8	n.a.	3.5	4.8	-
Japan	2007	2.3	-1.4	3.8	-0.1	-	-
Korea	2007	0.0	n.a.	n.a.	-	-	-
Luxembourg (1)	2004	52.2	n.a.	n.a.	52.2	0.0	0.0
Mexico	-	-	n.a.	x	-	-	-
Netherlands	2008	3.3	n.a.	n.a.	-	3.3	-
New Zealand	2007	4.4	n.a.	4.2	0.2	-	-
Norway	2004	2.1	n.a.	n.a.	2.3	-	-0.2
Poland	2004	-0.2	n.a.	n.a.	-0.2	-	-
Portugal	2006	-0.6	n.a.	n.a.	-0.8	-	0.2
Slovak republic	2006	-7.3	n.a.	n.a.	-8.6	-	1.3
Spain	2005	1.6	n.a.	n.a.	(3)	(3)	-
Sweden	2006	2.3	n.a.	n.a.	0.2	-	2.1
Switzerland	2007	6.7	n.a.	n.a.	6.7	-	-
United Kingdom	-	-	n.a.	n.a.	x	-	-
United States	2007	5.9	n.a.	n.a.	1.5	1.9	2.5
Other countries (OECD Accession Countries and Non-OECD EU countries)							
Bulgaria (1)	2004	3.4	n.a.	n.a.	3.4	-	-
Chile	2006	0.0	n.a.	n.a.	-	-	-
Cyprus	2006	4.9	0.2	n.a.	4.7	-	-
Estonia	2008	-2.1	n.a.	n.a.	-2.1	-	-
Israel	2007	9.1	n.a.	n.a.	2.5	4.7	1.9
Latvia	2008	-0.4	n.a.	n.a.	-0.4	-	-
Lithuania	2008	0.1	n.a.	n.a.	0.3	-	-0.2
Malta	-	-	n.a.	n.a.	x	x	-
Romania	2006	0.2	n.a.	n.a.	(3)	-	(3)
Russia	2007	36.9	n.a.	n.a.	2.8	34.2	-
Slovenia	2004	15.2	n.a.	n.a.	0.1	-	15.1

(1) 2004 survey results; (2) Estimation; (3) No figure available for adjustments.

(x): Adjustment made. n.a.: not applicable.

The economic territory: domestic versus national concepts

32. Adjustments for economic territory must be applied to move from the national concept to the domestic concept. Hence, employment figures in LFS should be adjusted by subtracting the number of resident people working outside the economic territory of a country and adding non-resident people working within the economic territory. Foreign embassies, consulates and military bases within the reporting country are not the part of the economic territory. International organisations are included as residents working abroad in LFS.

33. A large number of foreigners work in Luxembourg, and so the adjustment for the economic territory for Luxembourg is very high, i.e. 52.2%. Almost all countries make some adjustments for the economic territory. Only Chile, Iceland, Korea, Mexico and Netherlands make no adjustment.

Unobserved economy

34. According to 1993 SNA employment should cover the non-measured or unobserved part of the economy (NOE). This includes, for example, illegal workers, those working in the grey and black market, producers of agricultural production for own use (often as a second job) and construction workers building their own house.

35. Austria (2.4%), Belgium (1.7%), Czech Republic, Denmark (0.9%), Germany (2.3%), Greece, Italy (4.8%), Israel (4.7%), Hungary (3.6%), Luxembourg (0.0%), the Netherlands (3.3%), Russia (34.2%), Spain, and the United States (1.9%) make a correction of their employment data for the non-observed economy.

Other adjustments

36. A range of other adjustments are made to the employment figures from original sources. These adjustments are necessary because the surveys do not cover all workers or because persons are counted twice. The most common type of adjustments are the addition of persons living in institutional households like prisons, convents or students houses, who are not covered by surveys. For example, production by prisoners is counted in GDP estimates so the employment should be adjusted accordingly. The addition of employees falling outside the age boundaries of LFS, such as workers under 15 years old or above 74, is another frequently executed adjustment.

37. These adjustments can represent a significant portion of the total adjustment for some countries. This is the case for Canada (-3.8%), Slovenia (15.1%) and the United States (2.5%). Although these adjustments mostly have a positive impact, they are negative in Austria (-2.3%), Belgium (-1.9%), Canada (-3.8%), Finland (-0.7%), Lithuania (-0.2%) and Norway (-0.2%).

3.2.2.2. Hours worked

38. Table 4 summarises the impact of adjustments, as a percentage of the original data, in order to follow the national account concepts for the total number of hours worked. The potential adjustments are categorised as: holidays and annual leave; sickness leave; strikes and temporary lay-offs; paid but unreported overtime; over/under estimation of self-employed; NOE and other adjustments. As the exact subdivision of the adjustments is difficult to quantify, the table shows the total adjustment as a percentage.

39. The impact of adjustments on hours worked data in the original data sources is negative for nine countries and positive for 12. Five countries (i.e. Chile, Ireland, Korea, New Zealand and the United States) do not apply any adjustments, whereas the United States use business surveys as their main source

and the four remaining countries use LFS. Countries whose original data sources of hours worked are LFS have smaller or no adjustments because LFS already includes, by definition, actual hours worked.

40. Very substantial effects (positive or negative) of the adjustments are reported for Russia (41.1%), Slovak Republic (-18.8%), France (-17.2%), Italy (11.4%) and Israel (11.3%). Interestingly LFS is used only as a secondary source (France and Italy) for the hours worked data or unused at all (Russia and Slovak Republic) in these countries. In order to estimate hours worked accordingly to the national accounts concept, France and Italy need to reflect various types of leave and overtime in their hours worked data in the primary sources. Thus, they start with contractual hours, add time components such as paid and unpaid overtime, and subtract components such as sick leave, pregnancy and maternity leave, etc.

41. The substantial adjustment for Israel (11.3%) is due to numerous foreign workers and non-residents in Israel (LFS is the original data source for Israeli hours worked), contributions to growth being 3.5% for the non-resident foreigners, 5.6% non-registered foreigners (unobserved economy) and 2.2% of non-residents from Judea, Samaria and Gaza.

42. Not all countries apply an adjustment for the illegal economy. Russia is the country with the biggest percentage of adjustment for the non-observed economy. However, most countries only adjust the employment numbers and assume that these persons work the same average amount of hours per person working in that industry.

43. Some countries also adjust to correct the tendency of respondents to the LFS to overestimate their hours worked (Austria, Denmark, France, Spain and Italy). Adjustments for conscripts and non-residents as well as due to seasonal and calendar effects are also applied.

Table 4: Effect of adjustments to comply with 1993 SNA/1995 ESA concepts on hours worked

	Period	% change of total hours worked	Holidays & annual leave	Sickness leave	Strikes & temporary lay-offs	Paid but unreported overtime	Unpaid overtime	Over-estimation of self-employed	Non Observed Economy	Other adj.
OECD countries										
Australia (2)	Jun08	n.a.	-	-	-	-	-	-	-	X
Austria	2008	-5.3	x	x	-	x	x	x	x	x
Belgium (3)	n.a.	n.a.	x	x	-	-	-	-	x	x
Canada (1)	1999	-0.3	-	-	-	-	-	-	-	x
Czech republic	2004	-1.4	-	-	-	-	-	-	x	-
Denmark	2005	1.9	x	x	-	x	-	x	x	x
Finland	2008	2.6	-	-	-	-	-	-	x	x
France (1)	2001	-17.2	x	x	x	x	-	x	x	-
Germany (2)	2008	n.a.	x	x	x	x	-	-	-	x
Greece	2004	4.5	-	-	-	-	-	-	x	-
Hungary	2007	7.3	-	-	-	-	-	-	-	x
Ireland	2004	0.0	-	-	-	-	-	-	-	-
Italy	2004	11.4	x	x	x	x	x	x	-	x
Japan	2007	2.5	x	x	x	x	x	-	-	-
Korea	2007	0.0	-	-	-	-	-	-	-	-
Luxembourg (1)	2004	n.a.	x	x	x	x	x	-	-	-
Netherlands (2)	2008	n.a.	x	x	x	x	x	-	-	x
New Zealand	2007	0.0	-	-	-	-	-	-	-	-
Norway	2004	-8.9	x	x	-	x	-	-	-	x
Poland (3)	n.a.	n.a.	-	-	-	-	-	-	x	-
Portugal	2006	1.5	x	x	x	x	x	-	-	x
Slovak republic	2006	-18.8	x	x	x	x	x	-	x	x
Spain	2005	-3.4	-	-	-	-	-	x	-	-
Sweden	2006	3.4	-	-	-	-	-	-	x	x
Switzerland (2)	2007	n.a.	-	x	x	-	-	-	-	x
United States	2007	0.0	-	-	-	-	-	-	-	-
Other countries (OECD Accession countries and Non-OECD EU countries)										
Bulgaria (1)	2004	0.3	-	-	-	-	-	-	-	x
Chile	2006	0.0	-	-	-	-	-	-	-	-
Cyprus (3)	n.a.	n.a.	-	-	-	-	-	-	x	x
Estonia	2008	-2.1	-	-	-	-	-	-	-	x
Israel	2007	11.3	-	-	-	-	-	-	x	x
Latvia (3)	n.a.	n.a.	-	-	-	-	-	-	-	x
Lithuania	2008	0.1	-	-	-	-	-	-	-	x
Romania	2006	-0.3	-	-	-	-	-	-	-	x
Russia	2007	41.1	-	-	-	-	-	-	x	x

(1) 2004 survey results; (2) No primary source data. (3) Data not supplied. n.a.: Information not available. 'X' signifies that an adjustment is made in this area.

3.3. Improvements and changes between the two surveys

44. The section presents the changes in country sources and methodologies used for the compilation of employment and hours worked for the national accounts concept between the 2004 and the 2009 surveys. 14 countries have made some modifications to their way of producing employment estimates and six countries for hours worked.

45. Tables 5 and 6 show the differences in sources and methodologies for employment and hours worked between the two surveys, respectively.

3.3.1. Employment

46. Table 5 presents the modifications in sources and methodologies to employment between 2004 and 2009.

Table 5: New implementation between 2004 and 2009 for Employment

Austria	New sources (main sources are now social insurance and SBS); data are now presented in terms of persons (previously jobs).
Czech Republic	Additional information on self-employed from statistical surveys.
Denmark	New source, Monthly data reports of A-income, has been introduced.
Germany	Coverage of sources (50 now compared to 48 before); Monthly telephone Survey on employment has been abandoned; A new survey has been included: Statistics on public service personnel ("Personalstandstatistik"); Sources for commuters have changed.
Greece	New surveys at the industry level; People working in collective households, conscripts and employees under 15 years old are now taken into account.
Hungary	New adjustments to be in line with 1995 ESA (commuters, employed persons living in institutional households, unpaid workers in Household sector, agricultural producers for own final use, employed persons above the age of 74).
Ireland	Collection of data on a calendar basis from Q1 2009.
Latvia	Non-residents working with resident producer units are now taken into account using data from Survey on Labour; No more conscripts in Latvia from 2007.
Lithuania	Temporary working abroad persons have been added to total employment to follow the domestic concept.
Norway	LFS is now the main source (before LFS was combined with business and administrative surveys).
Poland	LFS is now the main source (before it was a combination of mainly business surveys and some administrative sources).
Portugal	Compilation of quarterly estimates.
Slovak Republic	Since 2006 conscripts do not exist in the Slovakia and armed forces are included in the enterprise survey.
Slovenia	Estimations are made now for illegal economy (drugs, prostitution) and deliberately non-registering activities (alternative healing, domestic services, teaching lessons).
Switzerland	Change in the main source, previously business survey (Jobs statistics) and now LFS (Employment statistics); data are now presented in terms of persons (previously jobs).

47. Six countries have used new sources for the compilation of their employment data. Norway, Poland and Switzerland are now using LFS as their main source and have replaced business surveys and administrative sources for LFS. Germany has increased the number of sources and has changed some sources (for example, for commuters). The Czech Republic has added new sources for the compilation of self-employed. Denmark has added a new source to the three existing sources.

48. Austria and Switzerland are now publishing their data in terms of persons rather than jobs.

49. Greece, Hungary, Latvia, Lithuania, and Slovenia have introduced new adjustments in order to be more in line with 1995 ESA.

3.3.2. Hours worked

50. Table 6 shows the modifications in sources and methodologies for hours worked between 2004 and 2009.

Table 6: New implementation between 2004 and 2009 for Hours worked

Australia	New methodology based on the Statcan calculation of hours worked. Moreover, Australia now provides hours worked in number and not anymore as an index.
Austria	New sources (SBS, STS and Labour Cost Survey 2004) to compile hours worked; Self-employed is now compiled with LFS.
Hungary	New adjustments for persons above 74, for agricultural unpaid workers and for non residents working within the economic territory.
Italy	New question on hours worked to the SBS survey in order to reduce the distortion of the information provided by enterprises with 100 workers and over.
Norway	LFS is now the main source for employees (previously sources were despite LFS, wage statistics and the register of employees in central and local government.
Poland	LFS is now the main source. Previously the source was the "Employment, wages and salaries and hours worked".
Portugal	Compilation of hours worked.

51. Austria, Norway and Poland have replaced some sources. Norway and Poland have moved from business survey to LFS. Austria is now using other business surveys and LFS to compile hours worked.

52. Australia has completely changed its way of compiling hours worked and has implemented the Canadian (Statcan) method for the compilation of hours worked.

53. Hungary has added new adjustments to comply with 1995 ESA recommendations and Italy added a new question in its structural business statistics questionnaire about hours worked to better measure enterprises with 100 or more employees.

4. Impact of adjustments to hours worked on labour productivity

54. As mentioned above labour input data collected via the LFS or other conventional sources do not typically fully reflect national accounts concepts. National employment data may have definitional differences due to the inclusion or exclusion of non-residents and residents working in and outside the economic territory respectively, military personnel and others in collective households, etc and estimates of average annual hours worked can vary across countries depending upon the way overtime, strike, etc are treated.

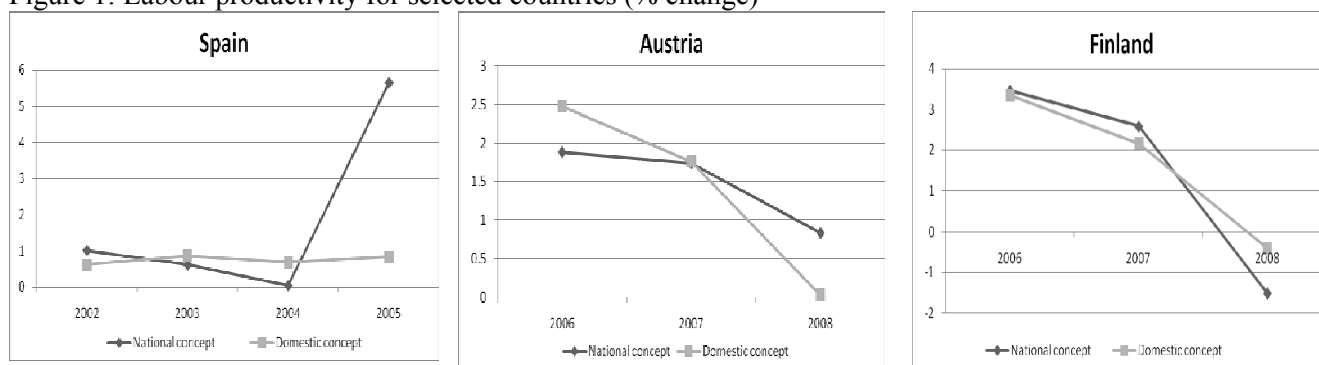
55. Both the 2004 and 2009 surveys showed that the implementation of adjustments to fulfill the domestic concept, for both employment and hours worked, is different between countries; depending on the use of national sources. However, incomplete adjustments are more common for hours worked than for employment. For employment, some countries make a large range of adjustments in order to follow as closely as possible the national accounts definition. Conversely the majority of countries makes very few adjustments and in some cases like Chile no adjustment at all.

56. The following three charts show the impact of adjustments made to hours worked, to move towards a national accounts concept, on estimates of labour productivity for Austria, Finland, and Spain. These countries have been selected as they provided time series of hours worked following both the national concept and the domestic concept. Hence, all hours worked data come from national sources. Spain provided data from 2001 to 2005 and Austria and Finland from 2005 to 2008. GDP is sourced from the OECD national accounts database.

57. Each chart of Figure 1 compares the growth rates of two labour productivities using different labour inputs.

58. The impact of the adjustments is different for the three countries. For Spain, the last data point is due to a large decrease of average hours worked based on the national concept. But, the graph shows that labour productivity following the national concept from 2002 to 2004 is characterized by decreasing growth whereas the labour productivity growth based on the domestic concept shows a slight increase in labour productivity growth. The two series are very similar for Finland. But for Austria the picture is mixed.

Figure 1: Labour productivity for selected countries (% change)



59. These results illustrate and reinforce the need for countries to increase their efforts to implement adjustments to hours worked. Moreover it will ensure further consistency in international comparisons.

5. Conclusions and future work

60. The results reinforce the need for estimates of labour input based on national accounts concepts. This will enhance the quality of analytical work and the effectiveness and reliability of policy recommendations.

61. Recognising however that these developments take time it would be preferable for Member countries to have detailed documentation on the sources and methods about labour input measures, making this information available, particularly to the OECD and Eurostat, and especially when methods change.

62. Alongside the harmonisation of labour input at the level of total economy, two other important aspects need to be taken into consideration in the future. The calculation of hours worked at the industry level and the quality aspect of the labour composition, the so-called Quality Adjustment Labour Input (QALI). The first consideration is less of an issue for the moment as the 2009 survey indicated that most countries compiling hours worked for the total economy also compile hours worked at the industry level.

63. The QALI labour productivity takes into account of the quality of labour input reflecting the skill dimension of labour. An increase in the average quality of labour implies that a quality-adjusted measure of labour input would rise faster than an unadjusted measure of labour input. OECD(2001) discusses advantages of measuring constant-quality labour input. First, it provides a more accurate indication of the contribution of labour to production. Second, a comparison of an adjusted and unadjusted measure of labour input yields a measure of the corresponding compositional or quality change of labour input. Thus, countries should also consider producing the quality adjusted labour input measures.

References

Burniaux J.M. (2007) “Factors Explaining Differences in Hours Worked Across OECD Countries” OECD Working Party No 1 on Macroeconomic and Structural Policy Analysis, ECO/CPE/WP1(2007)11.

Causa O. (2008) “Explaining Differences in Hours Worked Among OECD Countries: An Empirical Analysis” OECD Economics Department Working Paper No. 596 ECO/WKP(2008)4.

Lequiller, F. (2004), “Using National Accounts for Productivity Analysis”, OECD STD/NAES(2004)6.

Lequiller, F. (2005), “Using National Accounts for Productivity Analysis”, OECD (continued), STD/NAES(2005)25.

OECD (2001), Measuring productivity, OECD Manual: Measurement and aggregate and industry level of productivity growth, OECD, Paris

OECD (2008a), Compendium of Productivity Indicators 2008, OECD, Paris

OECD (2008b), “Labour Productivity and Unit Labour Cost Indicators”, March 2008 (see <http://www.oecd.org/dataoecd/28/37/40284233.pdf>).

OECD (2009), OECD Productivity Database - data sources for estimates of total employment and hours worked (see <http://www.oecd.org/dataoecd/31/14/43386348.pdf>).

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 nr.10 (see [http://www.euklems.net/pub/no10\(online\).pdf](http://www.euklems.net/pub/no10(online).pdf)).

Annex 1: Joint OECD/Eurostat questionnaireJOINT OECD/EUROSTAT SURVEY
ON LABOUR INPUT IN TERMS OF TOTAL HOURS WORKED
2009

The OECD Secretariat is once again undertaking a survey of methods used to estimate hours worked, and this is a follow-up to the one conducted in 2005.

The survey has several objectives. The first objective is to update the OECD's national accounts meta-database, which is available to all users of OECD.Stat.

The differences between the average number of hours worked per person or job between OECD countries are still quite large, and there are large differences in labour productivity between countries at a similar stage of development that are not easy to understand. Hence, the second objective is to better understand why these differences occur, and if possible to reduce them. A high degree of comparability between OECD countries of estimates of hours worked and labour productivity is highly desirable for many users.

The present questionnaire is divided in two different parts. The first one is very simple and aims to confirm the availability of labour input data in terms of total hours for the total economy (GDP). The second part is more complex and requires you to describe in detail how the national accounts estimates of hours worked are derived from the source data. For some countries this is a description of the bridge table between from the official labour force survey data for your country and the corresponding data in the national accounts at the level of total economy. For other countries it is a description of the bridge table between data from some other source(s) and the data in the national accounts.

We are very interested to learn to what extent the use of labour force survey data and data from other sources contribute to a loss of comparability between countries. Any information you can supply on this would be much appreciated. In particular, if you are able to compile estimates using both sources this could be very illuminating, and it may be possible to use such information to provide a gauge of the degree of comparability between countries that use different source data.

We would appreciate receiving your response before February 27, 2009.

Please return to olivier.brunet@oecd.org

2. Bridge table between source data and national accounts

The objective of this second section of the questionnaire is to explain in reasonable detail the steps taken to compile the national accounts estimates and the differences between (1) original sources on employment and hours worked, and (2) national accounts figures, for the total economy (GDP).

The questionnaire is based on a quantitative table for a recent year. A model format is given in the following page. However, this table can be adapted to your specific situation.

The coverage of the table should be the total economy (GDP wide).

The table assumes that the hours worked estimates are derived as the product of employment and average hours worked per person starting with labour force survey data. But if you derive your estimates of hours worked directly or you use another source(s), please modify the table accordingly.

The numbers should be considered approximate estimates. They are included for illustrative reasons and will not be used out of context. Adjustments can be included in percentage (e.g. +1.5%, -0.5%).

Please find attached your 2005 questionnaire and the two examples of such bridge tables, one for Canada (page 12) and one for France (page 13), in the following paper <http://www.oecd.org/dataoecd/33/14/33733365.pdf>

Please include, after the table, some information on the different adjustments introduced in the bridge table.

3. Additional questions on the bridge table

Part A of the bridge table: employment numbers

Question 2.1: what is the main original source for employment in the national accounts (i.e.: administrative source, Labour Force Survey, other)? Describe this source, its coverage, whether it is in terms of *jobs* or *persons*. Describe different sources if different sources are needed to evaluate different parts of the employed population, in particular, if necessary, differentiate sources between employees and self-employed.

Adjustments made by national accountants to original source:

Question 2.2: describe and evaluate possible adjustments made to pass from the concept of stocks (persons employed at given date) to the concept of average persons employed during the year.

Question 2.3: describe and evaluate possible adjustments made to transform the original source to adapt it to the concept of persons (if the original source is in terms of jobs), or conversely adapt it to the concept of jobs (if your country has chosen to publish national accounts data in terms of jobs and if the original source is in terms of persons).

Question 2.4: describe and evaluate adjustments made to this source in terms of coverage of the economic territory. Try to separate and evaluate adjustments for those in the military (including specifically conscripted forces, if necessary), other collective households not covered by the main source, residents working outside/inside the economic territory.

Question 2.5: describe and evaluate adjustments made to take into account of the non-observed economy.

Question 2.6: describe and evaluate other adjustments (residents working for non-resident producer units that are included in NA but not in labour force survey statistics, non-residents working with resident producer units—included in NA but not in labour force statistics, resident workers living permanently in an institution, resident workers under the age considered in labour force statistics, prisoners at work,...)⁴

Part B of the bridge table: annual hours worked per worker

Question 3.1: what is the main original source for average annual hours worked by worker in the national accounts (i.e.: administrative source --e.g. official working hours--, Labour Force Survey, other)? Describe this source and its coverage. Describe the ability of this source to reflect the ILO definition of hours worked (see paragraphs 17.11 of 1993 SNA). Describe different sources if different sources are needed to evaluate different parts of the employed population, in particular, if necessary, differentiate sources between employees and self-employed.

Possible adjustments made on original source on annual hours worked per person

Question 3.2: describe the different adjustments made to transform the original source data to adapt it to the concept of working hours in terms of national accounts. Try to separate and evaluate adjustments:

- to take into account holidays and annual leaves
- for sickness leave,
- for strikes and temporary lay-offs

⁴ ESA95 paragraphs 11.17 to 11.19 describe very precisely what is included and not included in the NA concept of employment.

for paid but not reported overtime
for unpaid overtime

Question 3.3: describe the estimation of hours worked for the self-employed? Is a specific adjustment made for unreported overtime for self-employed people? On the contrary, if Labour Force Statistics data are used, do you introduce a downward adjustment to reported actual hours by self-employed?

Question 3.4: if an adjustment is made for the number of employed in relation to the no-observed economy, what assumption is made regarding the hours worked by these persons?

Question 3.5: other adjustments before final figure for national accounts annual average working hours?

Part C of the bridge table: Total hours

Question 4.1: Describe the method to obtain finally total hours

Other issues

Question 4.2 do you use the concept of full-time equivalent in your published data? If not do you use it in your compilation process?

4. If the Labour Force Survey is not the primary source of data used to derive your estimates of hours worked. Are you able to quantify, even approximately, what the difference would be between your current estimates and those you would obtain if you did use the Labour Force Survey data as your primary source?

Annex 2: Table 0303 by industry of OECD/Eurostat questionnaire

ESA95 Questionnaire 0303 - Employment

REF_AREA:		UNIT:	UNITS	Eurostat	- Employment of residents and non-residents employed by resident producer units (domestic concept).					
TIME:		UNIT_MULT:								
ADJUSTMENT:		OBS_STATUS:	A							
ADJUST_DETAIL:		OBS_CONF:	F							
PRICE:	Z	OBS_PRE_BREAK:								
PRICE_BASE:	Z	OBS_COM:								
TRANS:	Row 25	DECIMALS:			Eurostat Footnotes					
ASSET:	Z	COLLECTION:								
SECTOR:	Row 26	AVAILABILITY:								
CPAREA:		TITLE_COMPL:								
CPSECTOR:		COMPILATION:								
NACE:	Col 1	COVERAGE:								
CPA_FROM:		SOURCE_PUB:		Missing / zero:	M = "not applicable / do not exist" ; L = "not available / exist but not collected or not transmitted" ; 0 = "exist but value is zero or considered as zero"					
CPA_TO:		SOURCE_AGC:		DSI:	ESAP2BRK_0303_A	SUFFIX:	0303	Control start:	A27	
COFOG:		ORGANISATION:		Form version:	P2_B006	FREQ:	A	Data start:	B28	
COICOP:	Z	Sender name:		Sender Footnotes						
REGION:		Sender e-mail:								
DC_AL:	Z	Version:								
CONS:		Update:								
DENOM:		Date:								

Annual	Employment			Employees by sector	
	Total	Employees	Self-employed	Employees in general government	Employees outside general government
TRANS ►	EETO	EEEM	EESE	EEEM	EEEM
SECTOR ►	S1	S1	S1	S13	S1W
NACE ▼	1=2+3	2	3	4	5
Y					
YA					
YB					
YC					
YCA					
YCB					
YD					
YDA					
YDB					
YDC					
YDD					
YDE					
YDF					
YDG					
YDH					
YDI					
YDJ					
YDK					
YDL					
YDM					
YDN					
YE					
YF					
YG					
YH					
YI					
YJ					
YK					
YL					
YM					
YN					
YO					
YP					
YQ					

Annex 3: terminology and definitions

This annex gives an overview of the common definitions for key variables on both employment and hours worked used in both the 1993 System of National Accounts (1993 SNA) (see in particular, chapter XVII) and 1995 European System of Accounts (1995 ESA) (see in particular, Chapter 11) and the OECD manual “Measuring Productivity”.

Employment

The 1993 SNA and 1995 ESA define employment⁵ to cover all persons engaged in some productive activity that falls within the production boundary of the system. This ensures a conceptual consistency between measures of output and employment.

Employees, self-employed and unpaid family workers

According to the 15th International Conference of Labour Statisticians (ICLS) resolution, *employees* are all those workers who hold a paid job. Employees with stable contracts have, and continue to have, an explicit (written or oral) or implicit contract of employment, or a succession of such contracts, with the same employer on a continuous basis. Employees are those with stable contracts for whom the employing organization is responsible for payment of taxes and social security contributions.

The 1993 SNA defines *self-employed* persons as the sole owners, or joint owners, of the unincorporated enterprises in which they work, excluding those unincorporated enterprises that are classified as quasi-corporations.

An *unpaid (or contributing) family worker* is a person who holds a self employment job in a market-oriented establishment operated by a related person living in the same household, and who cannot be regarded as a partner because of the degree of his or her commitment to the operation of the establishment, in terms of the working time or other factors to be determined by national circumstances, and is not at a level comparable with that of the head of the establishment.

Persons versus Jobs

Employment data in the 1993 SNA can be expressed in terms of either jobs or persons. The 1993 SNA recommends publishing data in terms of persons. The number of jobs is equal to the number of persons with at least one job plus the number of second, third, etc jobs.

Domestic versus national concepts

National accounts measure two different concepts: the domestic concept and the national concept. These two concepts are applied to national accounts and to employment. The domestic concept is the preferred measure and includes all employment within the economic territory.

⁵ The definition of 1993 SNA and 1995 ESA for employment differs from the ILO definition. The two major differences are linked to the economic territory (for example: commuters, armed forces) and the production boundary (for example, non-observed economy).

According to the 1993 SNA, Chapter 14.9, the economic territory of a country consists of the geographic territory administered by a government within which persons, goods, and capital circulate freely. The economic territory of a country includes:

- The airspace, territorial waters, and continental shelf lying in international waters over which the country enjoys exclusive rights or over which it has, or claims to have, jurisdiction in respect of the right to fish or to exploit fuels or minerals below the sea bed;
- The territorial enclaves in the rest of the world; and,
- Any free zones, or bonded warehouses or factories operated by offshore enterprises under customs control (these form part of the economic territory of the country in which they are physically located).

Hours worked

Total hours worked

In the 1993 SNA total hours worked represents the aggregate number of hours actually worked as an employee or self-employed. The OECD Glossary of Statistical Terms identify *Hours actually worked*⁶ as time spent at the workplace on productive activities and other activities, which are part of the tasks and duties of the workers concerned (e.g., cleaning and preparing working tools). It also includes time spent at the place of work when the person is inactive for reasons linked to the production process or work organization (for example, standby time), as during these periods paid workers remain at the disposal of their employer. Hours actually worked also includes short-rest periods spent at the workplace because they are difficult to distinguish separately, even if workers are not “at the disposal” of their employer during those periods. Explicitly excluded are lunch breaks, as they normally are sufficiently long to be easily distinguished from work periods. Time needed to travel from home to work and vice versa and hours paid but not worked (such as public holidays, paid annual leave, sickness, maternity leave) are also excluded. Hours actually worked equal paid hours actually worked plus unpaid hours worked (voluntary work and unpaid overtime).

The OECD Glossary of Statistical terms also defines *usual hours of work per week*⁷ as the most common weekly working schedule over a selected period of a person in employment. Thus, it is equal to average hours actually worked in normal weeks (including paid and unpaid overtime). While no international definition of usual hours of work exists, it has been defined as the hours worked in an activity during a typical week, seven or more technically, as the modal value of the workers’ hours actually worked per week over a long period. This definition is applicable to all workers with regular schedules, even to those who do not possess a working contract – for example, workers engaged in small-scale or family enterprises, or self-employed workers. For workers who work irregular schedules, measures of average hours actually worked per week over a long period are sometimes used.

Usual hours of work include overtime that occurs systematically every day or week, and excludes time not worked on a usual basis. This measure is affected neither by irregular or unusual overtime (whether worked for premium pay, regular pay, or not compensated at all), nor by unusual absence or rest.

⁶ Also in Key Indicators of the Labour Market (KILM): 2001-2002, International Labour Organisation, Geneva, 2002, page 207.

⁷ Also in Key Indicators of the Labour Market (KILM): 2001-2002, International Labour Organisation, Geneva, 2002, page 203.

Two additional definitions relating to hours worked are *paid hours of work*, which is the sum of the paid hours actually worked and the paid hours of absence; and *contractual or agreed hours of work*, which are equal to the difference between the paid hours of work and the paid overtime hours.

Working time is the period of time that an individual spends at paid occupational labor. Unpaid labors such as housework are not considered part of the working week. Many countries regulate the work week by law, stipulating minimum daily rest periods, annual holidays and a maximum number of working hours per week.

Hours per persons versus hours per jobs

For the whole economy, total hours can be compiled independently with the job component or the person component. The multiplication of number of jobs by hours worked per job equals the multiplication of number of persons by hours worked per person.

Other variables

Compensation of employees

One key variable used for the calculation of unit labour costs is *compensation of employees*. The OECD Glossary of Statistical terms defines Compensation of employees as the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period. Compensation of employees has two main components: (a) Wages and salaries payable in cash or in kind; and (b) The value of the social contributions payable by employers: these may be actual social contributions payable by employers to Social Security schemes or to private funded social insurance schemes; or imputed social contributions by employers providing unfunded social benefits⁸.

Full-time equivalence

The 1993 SNA (Chapters 17.14 to 17.18) defines *full-time equivalent employment* as the number of full-time equivalent jobs. This is composed as total hours worked divided by average annual hours worked in full-time jobs.

Labour productivity

The OECD manual “Measuring Productivity” [OECD (2001)] defines *labour productivity* as relating value added to labour inputs, the latter is most appropriately measured as the total number of actual hours worked.

⁸ The relationship between compensation of employees, earnings and wages rates are:

- Compensation of employees: earnings plus employer contribution to statutory social security schemes or to private funded social insurance schemes, and plus unfunded employee social benefits paid by employers in the form of: (a) children’s, spouse’s, family, education or other allowances in respect of dependants; (b) payments made to workers absent from work because of illness, accidental injury, maternity leave, etc.; (c) severance payments.
- Earning: wages rates (i.e. basic wages, cost-of living allowances, and other guaranteed and regularly paid allowances) plus remuneration for time not worked, plus bonuses and gratuities regularly or irregularly paid, plus overtime payments, and plus payments in kind.

Multi-factor productivity (MFP)

According to the OECD manual “Measuring Productivity”, *MFP* relates on a change in output to several types of inputs. *MFP* is usually measured residually as that change in output that cannot be accounted for by the change in combined inputs.

For further information on productivity indicators published by the OECD, please refer to the OECD Compendium of Productivity Indicators 2008 [OECD (2008a)].

Annex 4: Current situation on hours worked in OECD domain

Four directorates within the OECD (i.e. Statistics directorate (STD); the Directorate for Employment, Labour and Social Affairs (ELS); the Economics Department (ECO) and the Directorate for Science, Technology and Industry (STI)) are working on hours worked and their comparability since 2003, especially in the context of productivity purposes. Since the launch of this joint project on employment and hours worked, the comparability of hours worked has been improved but given the variety of data sources and discrepancies in national approaches, international comparability of working time still remains an issue [OECD(2004)].

The National Accounts division of STD collects national estimates of hours actually worked data from national statistical agencies via quarterly and annual national accounts questionnaires. Thus the methodology ensured cross comparability as much as possible.

The STD Productivity Database provides the best internationally comparable annual estimates of labour productivity and multi-factor productivity (MFP) for the total economy as a whole [OECD (2009)]. The STI Structural Analysis (STAN) database provides annual estimates for analysing industrial performance at a detailed level of activity. Designed for modeling purposes, it is used to derive estimates of labour productivity that, while less comparable than those in Productivity Database, provide insights into labour productivity by industry.

The default source for total hours worked in the productivity database is the OECD annual SNA database. However, for a number of countries, the national accounts do not provide hours worked and other sources have to be used. Data consistency is achieved by matching the hours worked that are collected by ELS for its annual *OECD Employment Outlook* with the appropriate measure of employment for each country, i.e. the measure of employment that is consistent with the measure of hours worked collected by the OECD.

An initiative from ECO to improve the comparability of hours worked is described by Burniaux (2007) and Causa (2008). Their proposals for the method used to estimate annual hours worked is to apply to normal weekly hours of work two components: (1) an index of regulations determining weekly hours worked, including normal weekly hours' limits, regulations relative to overtime and regulations influencing the intensity of part-time work; and (2) an index summarizing regulations affecting weeks of absence, including statutory minimum paid leave, holidays and sickness and maternity leave.

STD has developed a System of Unit Labour Cost and Related Indicators database in response to demand of internationally comparable data concerning labour costs, particularly in activities outside of Manufacturing and on a sub-annual basis. This database compiles annual and quarterly ULC and related indicators, including annual labour productivity (computed as the GDP per unit of labour with labour defined as hours worked or employment), according to a methodology that ensures comparability across countries. This system is principally based on national accounts concepts and data, but brings together a wide range of sources for quarterly data.

For further information on the OECD databases mentioned above using hours worked (STAN, Productivity database and ULC), please refer to OECD (2008b).