

ANNEX

METHODOLOGY AND LIMITATIONS

1. Methodology

1. Introduction

The personal circumstances of taxpayers vary greatly. This Report therefore adopts a specific methodology to produce comparative statistics covering taxes, benefits and labour costs across OECD Member countries. The framework of the methodology is as follows:

- The Report focuses on eight different family types which vary by household composition and level of earnings.
- Each household contains a full-time adult employee working in one of a broad range of industry sectors of each OECD economy. Some of the households also have a spouse working less than full-time.
- The annual income from employment is assumed to be equal to a given fraction of the average gross wage earnings of these workers.
- Additional assumptions are also made regarding other relevant personal circumstances of these wage earners in order to calculate their tax/benefit position.

The guidelines described in the following paragraphs form the basis for the calculations shown in Parts O, I, II and III. Table A.1 sets out the terminology that is used. Where a country has had to depart from the guidelines, this is noted in the text and/or in the country chapters contained in Part III of the Report. The number of taxpayers with the defined characteristics and the wage level of the average workers differ between OECD economies.

2. Taxpayer characteristics

The eight household types identified in the Report are set out in Table A.2. Any children in the household are assumed to be aged between six and eleven inclusive.

The family is assumed to have no income source other than employment and cash benefits.

Table A.1 Terminology

General terms	
Average worker (AW)	An adult full-time worker in the industry sectors covered whose wage earnings represent the average for workers
Single persons	Unmarried men and women
Couple with two children	Married couple with two dependent children between six to eleven years of age inclusive
Labour costs	The sum of Gross wage earnings, employers' social security contributions and payroll taxes
Net take-home pay	Gross wage earnings less the sum of personal income tax and employee social security contributions, plus cash transfers received from general government
Personal average tax rate (tax burden)	The sum of Personal income tax and employee social security contributions expressed as a percentage of gross wage earnings
Tax wedge	The sum of personal income tax, employee and employer social security contributions plus any payroll tax less cash transfers, expressed as a percentage of labour costs.
Elasticity of income after tax	Percentage change in 'after-tax' income following an increase in one currency unit of income before tax (defined more precisely as one minus a marginal tax rate divided by one minus a corresponding average tax rate)
Terms used under the income tax	
Tax reliefs	A generic term to cover all the means of giving favourable income tax treatment to potential taxpayers
Tax allowances	Amounts deducted from gross earnings to arrive at taxable income
Tax credits	Amounts which a taxpayer may subtract from his tax liability. They are described as payable if they can exceed tax liability (sometimes the terms 'refundable' and 'non-wastable' are used)
Standard tax reliefs	Reliefs unrelated to the actual expenses incurred by taxpayers and automatically available to all taxpayers who satisfy the eligibility rules specified in the legislation are counted as standard reliefs. These also include deductions for compulsory social security contributions
Basic relief	Any standard tax relief available irrespective of marital or family status
Marriage allowance	Additional tax relief given to married couples. (In some countries, this is not distinguished from the basic relief which may be doubled on marriage)
Non-standard tax reliefs	Reliefs wholly determined by reference to actual expenses incurred
Average rate of income tax	Amount of income tax payable after accounting for any reliefs calculated on the basis of the tax provisions covered in this Report, divided by gross wage earnings
Schedule rate	The rate which appears in the schedule of the income tax and in the schedule of social security contributions
Terms used under cash transfers	
Cash transfers	Cash payments made by general government (agencies) paid to families usually in respect of dependent children.

Table 1. Table A.2. Characteristics of taxpayers¹

Marital status	Children	Principal earner	Secondary earner
Single individual	No children	67% of average earnings	
Single individual	No children	100% of average earnings	
Single individual	No children	167% of average earnings	
Single individual	2 children	67% of average earnings	
Married couple	2 children	100% of average earnings	
Married couple	2 children	100% of average earnings	33% of average earnings
Married couple	2 children	100% of average earnings	67% of average earnings
Married couple	No children	100% of average earnings	33% of average earnings

1. The Taxing Wages models use 1/3 of average earnings rather than 33% of them, 2/3 of average earnings rather than 67% and 5/3 of average earnings rather than 167%.

3. *The range of industries covered*

The standard assumption for calculating average wage earnings is based on Sectors B-N of the *International Standard Industrial Classification of All Economic Activities* (ISIC Revision 4, United Nations)¹ (see Table A.3). Many countries (for more detailed country information, see Table 0.6) have now adopted this approach

This approach broadly corresponds to the previous calculation based on sectors C-K incl. defined in the *International Standard Industrial Classification of All Economic Activities* (ISIC Revision 3.1, United Nations)¹¹ which was adopted in the 2005 edition of *Taxing Wages*. The reasons for moving to a broadened average wage definition were set out in the Special Feature of *Taxing Wages* 2003-2004.

As stated in Part I, Section 1 of this Report, only Turkey has not yet moved to this broadened industry definition. The average wage figures reported for Turkey therefore still refer to the approach used prior to the 2005 edition - manual workers in manufacturing (industry sector D). These differences may affect the comparability of the data.

Table A.3. **International Standard Industrial Classification of All Economic Activities**

Revision 3.1 (ISIC Rev. 3.1)	
A	Agriculture, hunting and forestry
B	Fishing
C	Mining and quarrying
D	Manufacturing
E	Electricity, gas and water supply
F	Construction
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants
I	Transport, storage and communications
J	Financial intermediation
K	Real estate, renting and business activities
L	Public administration and defence; compulsory social security
M	Education
N	Health and social work
O	Other community, social and personal service activities
P	Activities of private households as employers and undifferentiated production activities of private households
Q	Extraterritorial organisations and bodies
Revision 4 (ISIC Rev.4)	
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage

I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organizations and bodies

4. Defining gross wage earnings

This section sets out the assumptions underlying the calculation of the average earnings figures for ‘the average worker’. The gross wage earnings data have been established using statistical data and the methodologies for calculating the earnings data in each country are set out in Table A.4. Further information on the calculation of the earnings figure is provided in the country chapters in Part III. The sources of the statistical data for each country are set out in Table A.5.

The main assumptions are as follows:

- The data relate to the average earnings in the industry sectors for the country as a whole.
- The calculations are based on the earnings of a full-time adult worker (including both manual and non-manual). They relate to the average earnings of all workers in the industry sectors covered. No account is taken of variation between males and females or due to age or region.
- The worker is assumed to be full-time employed during the entire year without breaks for sickness or unemployment. However, several countries are unable to separate and exclude part-time workers from the earnings figures (see Table A.4). Most of them report full-time equivalent wages in these cases. In four countries (Chile, Ireland, Slovak Republic and Turkey), the wages of part-time workers can be neither excluded nor converted into full-time equivalents because of the ways in which the earnings samples are constructed. As a result, average wages reported for these countries will be lower than an average of full-time workers (for instance, Secretariat analysis of available Eurostat earnings data for selected European countries has shown that including part-time workers reduces average earnings by around 10%). Also, in most of the OECD countries where sickness payments are made by the employer, either on behalf of the government or on behalf of private sickness schemes, these amounts are included in the wage calculations. It is unlikely that this has a marked impact on the results since employers usually make these payments during a short period and the amounts usually correspond very closely to normal hourly wages.
- Two of the household types include a second earner at 33 per cent of average earnings. Such individuals are more likely to be working part-time rather than full-time (as shown in the Special Feature of the 2005 edition). However, it is also shown that the assumption that all employees are

working full-time does not significantly affect the tax rates calculated in *Taxing Wages*, except in the case of Belgium for married couples where the spouse is earning 33 per cent of the average wage level. This is because any special provisions made for part-time workers tend to be either of minor importance or not applicable for the household types currently presented in *Taxing Wages*.

- The earnings calculation includes all cash remuneration paid to workers in the industries covered taking into account average amounts of overtime, cash supplements (e.g. Christmas bonuses, thirteenth month) and vacation payments typically paid to workers in the covered industry sectors. However, not all countries are able to include overtime pay, vacation payments and cash bonuses according to the definition.
- The earnings figures include supervisory and/or management employees, though some countries are not able to do this. In such countries, the reported averages are lower than would otherwise be the case (for instance, OECD Secretariat analysis of available Eurostat earnings data for selected European countries has shown that excluding this type of workers can reduce average earnings by 10% to 18%). In the case of Turkey that has not yet been able to move to the broadened industry definition, the definition includes only manual workers and minor shop-floor supervisory workers in the manufacturing industry.
- Fringe benefits – which include, for example, provision of food, housing or clothing by the employer either free of charge or at below market-price – are, where possible, excluded from the calculation of average earnings. This could affect comparability of tax wedges – as the reliance on fringe benefits may vary between countries and over time. However, the lack of comparability is probably limited as fringe benefits rarely account for more than 1-2 per cent of labour costs and are normally more common among high-income employees than in the income ranges covered by *Taxing Wages* (33 to 167 per cent of average earnings). Table A.4 shows that some Member countries are not able to exclude fringe benefits from the earnings figures reported and used in *Taxing Wages*. The decision to exclude was taken because:
 - these types of benefits are difficult to evaluate in a consistent way (they may be valued at the actual cost to the employer, their value to the employee or their fair market value).
 - in most countries, they are of minimal importance for workers at the average wage level.
 - the tax calculations would be significantly more complicated if the tax treatment of fringe benefits were to be incorporated.
- Employers' contributions to private pension, family allowance or health and life insurance schemes are excluded from the calculations, though the amounts involved can be significant. In the United States, for example, these contributions can account for more than 5 per cent of the earnings of employees. The country chapters in Part III indicate of the existence of schemes which may be relevant for an average worker.

¹ Not all national statistical agencies use ISIC Rev.3.1 or ISIC Rev.4 to classify industries. However, the Statistical Classification of Economic Activities in the European Community (NACE), the North American Industry Classification System (NAICS) and the Australian and New Zealand Standard Industrial Classification (ANZSIC) include a classification which is broadly in accordance with industries C-K in ISIC Rev.3.1 or industries B-N in ISIC Rev.4.

Table A.4. Method used to calculate average earnings

	Items included and excluded from the earnings base					Types of worker included and excluded in the average wage measure			Basic method of calculation used	Income tax year ends	Period to which the earnings calculation refers
	Sickness ¹	Vacations	Overtime	Recurring cash payments	Fringe Benefits	Supervisory workers	Managerial workers	part-time workers			
Australia	Inc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Average weekly earnings x 52	30th June	Fiscal year
Austria	Exc	Inc	Inc	Inc	Taxable value Inc	Inc	Inc	Exc	Average annual earnings	31st December	Calendar year
Belgium	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Monthly earnings in October x 12 (plus recurring bonuses)	31st December	Calendar year
Canada	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Inc ⁶	Average weekly hours x average hourly earnings x 52	31st December	Calendar year
Chile	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Inc	Hourly earnings x hours worked	31st December	Calendar year
Czech Republic	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Inc ⁶	Average monthly earnings x 12	31st December	Calendar year
Denmark	Exc	Inc	Exc	Inc	Exc	Inc	Inc	Inc ⁶	Hourly earnings x hours worked	31st December	Calendar year
Estonia	Inc	Inc	Inc	Inc	Exc	Inc	Inc	Inc	Average earnings	31st December	Calendar year
Finland	Exc	Inc	Inc	Inc	Exc	Inc	Inc ⁵	Exc	Hourly wages x usual working time or (monthly earnings x months) + vacation payments+ end of year bonuses	31st December	Calendar year
France	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Annual earnings	31st December	Calendar year
Germany	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Annual earnings	31st December	Calendar year
Greece	Exc	Inc	Inc	Inc ²	Inc	Inc	Inc	Exc	Hourly earnings x hours worked	31st December	Calendar year
Hungary	Exc	Inc	Inc	Inc	Exc	Inc	Inc ⁵	Exc	Average monthly earnings x 12	31st December	Calendar year
Iceland	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Hourly earnings x hours worked x 12	31st December	Calendar year
Ireland	Exc	Inc	Inc	Inc	Exc	Exc	Exc	Inc	Average weekly earnings in each quarter for four quarters/4*52	31st December	Calendar year
Israel	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Average earnings	31st December	Calendar year
Italy	Exc ³	Inc	Inc	Inc	Exc ⁴	Inc	Inc	Inc ⁶	Average monthly earnings x 12	31st December	Calendar year
Japan	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Monthly earnings in June x 12	31st December	Calendar year
Korea	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Average monthly earnings x 12	31st December	Calendar year
Luxembourg	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Aggregate annual earnings divided by annual average number of full-time employees. Any parts of earnings that exceed the upper social contribution limit (7 times the minimum wage) are not recorded.	31st December	Calendar year

Mexico	Exc	Inc	Exc	Inc	Exc	Inc	Inc	Exc	Average monthly earnings x 12	31st December	Calendar year
Netherlands	Exc	Inc	Exc	Inc	Exc	Inc	Inc	Exc	Annual gross earnings	31st December	Calendar year
New Zealand	Exc	Inc	Inc	Inc	Exc	Inc	Inc ⁵	Inc ⁶	Average weekly earnings in each quarter x 13	31st March	Tax year
Norway	Exc	Exc	Inc	Inc	Exc	Inc	Inc	Inc ⁶	Annual wages + estimated overtime	31st December	Calendar year
Poland	Inc	Inc	Inc	Inc	Exc	Inc	Inc	Inc ⁶	Average monthly earnings x 12	31st December	Calendar year
Portugal	Exc	Inc	Inc	Inc	Inc	Inc	Inc	Exc	Weighted monthly average x 12	31st December	Calendar year
Slovak Republic	Exc	Inc	Inc	Inc	Inc	Inc	Inc	Inc	Average monthly earnings x 12	31st December	Calendar year
Slovenia	Inc	Inc	Inc	Inc	Exc	Inc	Inc	Inc	Average monthly earnings * 12	31st December	Calendar year
Spain	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Weighted monthly average x 12	31st December	Calendar year
Sweden	Exc	Inc	Inc	Inc	Actual value Inc	Inc	Inc	Inc ⁶	Average hourly earnings in September x hours worked; and monthly earnings in September * 12	31st December	Calendar year
Switzerland	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Inc ⁶	Monthly earnings x 12	31st December	Calendar year
Turkey	Exc	Inc	Inc	Inc	Actual value inc	Exc	Exc	Inc	Average annual earnings	31st December	Calendar year
United Kingdom	Exc	Inc	Inc	Inc	Exc	Inc	Inc	Exc	Average gross annual earnings	5th April	Fiscal year
United States	Exc	Inc	Inc	Inc ²	Exc	Inc	Inc	Inc ⁶	Average weekly earnings x 52	31st December	Calendar year

Note: Exc = Excluded Inc = Included '-' = information not available.

1. Usually includes compensation paid by employer whether paid on behalf of the government or as part of a private sickness scheme.
2. Excludes profit sharing bonuses in Greece and the United States plus end of year bonuses in the United States.
3. Sickness payments are only included to the extent that they are paid by the employer. For manual workers, this is only the case during the first three days of sick leave, while payments for the fourth day onwards are made by INPS.
4. Partly: the (small) taxable part of fringe benefits is included.
5. Except for top management (Finland); except if income from profits exceeds 50% of total income (Hungary); except for proprietors (New Zealand).
6. Part-time wages are converted to full-time equivalents before calculating the average wage measure.

5. Calculating average gross wage earnings

Table A.4 indicates the basic calculation method used in each country while more details are, where relevant, provided in the country chapters in Part III. In principle, countries are recommended to calculate annual earnings by referring to the average of hourly earnings in each week, month or quarter, weighted by the hours worked during each period, and multiplied by the average number of hours worked during the year, assuming that the worker is neither unemployed nor sick and including periods of paid vacation. A similar procedure was recommended to calculate overtime earnings. For countries unable to separate out part-time employees from the data, it is recommended that earnings of part-time employees should if possible be converted into their full-time equivalents.

Statistical data on average gross wage earnings in 2013 are generally not available at present. Estimates of gross wage earnings of average workers in 2013 were therefore derived by the Secretariat on the basis of a uniform approach: all year 2012 earnings levels (or the earnings level in the most recent year for which final average wage earnings country information is available) are multiplied by the country-specific annual percentage change of wages for the whole economy reported in the most recently published edition of the OECD *Economic Outlook*.¹ This transparent procedure is intended to avoid any bias in the results. In some countries, there were varying different approaches;

- the final 2013 average gross wage earnings was used for Australia.
- National estimates were used for the Chile, Estonia, New Zealand and Turkey as the OECD Economic Outlook does not provide percentages changes in wages for those countries.
- Average wage earnings were also estimated for prior years for Finland (2012), France (2012), Ireland (2012), the Netherlands (2012) and Switzerland (2007, 2009, 2011, 2012) as no country information on average wage earnings levels was available for these years in these countries.

Table A.5. Source of earnings data, 2013

Country	Type of sample	Source
Australia	Quarterly survey of firms resulting in a representative sample of wage and salary earners in each industry.	Australian Bureau of Statistics "Average Weekly Earnings, Australia" and "Labour Force, Australia"
Austria	Annual Wage Tax Statistics	"Lohnsteuerstatistik"
Belgium	Data collected or estimated on the basis of an annual establishment survey and social insurance registers of employees	Statistics Division of the Ministry of Economy (Federal Public Service, Economy, SMEs, Self-employed and Energy). Same source as for Eurostat "Annual gross earnings" data.
Canada	Monthly survey of all firms	Statistics Canada, "Survey of Employment Payrolls and Hours"
Chile	Monthly sample of businesses with 10+ employees	National Statistics Institute of Chile (INE)
Czech Republic	Employer survey data	National Statistical Office
Denmark	Danish Employers Confederation survey of earnings	Annual Report Danish Employers Confederation (Dansk Arbejds Giverforening)
Estonia	-	Statistics Estonia/Ministry of Finance
Finland	(1) Finnish Employers Federation survey of hourly and monthly earnings; (2) Survey for unorganized employers "Structure of Earnings Statistics" published by the Central Statistical Office	"Wages Statistics" published by the Central Statistical Office
France	Social insurance registers covering all employers.	INSEE, "Déclarations Annuelles des Données Sociales" (DADS)

Germany	Survey carried out by the Federal Statistical Office	National Statistical Office
Greece	Survey carried out by National Statistics Service and Social Security Institutions	National Statistical Service Labour Statistics. Same source as for Eurostat "Annual gross earnings" data.
Hungary	Monthly surveys among enterprises with at least five employees.	Central Statistical Office
Iceland	Monthly survey of earnings in the private sector market	Statistics Iceland
Ireland	Quarterly surveys of industrial employment, earnings and hours worked	Central Statistics Office
Israel	-	Central Bureau of Statistics
Italy	Quarterly indicators of wages in industry and services (OROS)	National Institute of Statistics
Japan	Basic survey on wage structure of all establishments with more than 10 employees	Ministry of Health, Labour and Welfare, Annual Report
Korea	Labour Force Survey at Establishments	Ministry of Employment and Labour
Luxembourg	Monthly aggregated files of Social security services.	National Statistical Office and Social Security Services.
Mexico	Administrative data from the Mexican Social Security Institute (Instituto Mexicano del Seguro Social (IMSS))	The National Minimum Wage Commission (Comisión Nacional de Salarios Mínimos (CONASAMI))
Netherlands	Survey "Employment and Wages"	Central Bureau of Statistics, Statline
New Zealand	The quarterly employment survey is a sample survey of significant business with an employment count of 1 or more	Statistics New Zealand INFOS
Norway	Sample of enterprises based on published sector statistics for 3rd quarter – except agriculture, forestry and fishing and private households	Statistics Norway Wage
Portugal	April and October survey of earnings carried out by the Ministry of Labour	Ministry of Labour
Poland	Estimates for different sectors	Monthly Statistical Bulletin
Slovak republic	Quarterly and annual statistical data	Slovak Statistical Office
Slovenia	Monthly survey of employees	Statistical Office of the Republic of Slovenia
Spain	Quarterly survey of firms	Instituto Nacional de Estadística "Encuesta Trimestral de Coste Laboral" (Labour Cost Survey)
Sweden	September survey of Swedish employers	Statistics Sweden
Switzerland	Swiss Statistics Office. Personnes actives occupées selon la branche économique	La vie économique, SECO (Secrétariat d'État à l'économie) table B.8.1, http://www.bfs.admin.ch/bfs/portal/fr/index/themen/03/04.html
Turkey	Annual Manufacturing Industry Survey	Turkish Statistical Institute
United Kingdom	1% sample of PAYE earnings	Office for National Statistics, Annual Survey of Hours and Earnings (ASHE)
United States	Monthly surveys by Department of Labour on the basis of a questionnaire covering more than 40 million non-agricultural wage and salary-workers	Employment, Hours, and Earnings from the Current Employment Statistics Survey

Sixteen of the OECD member countries have opted to provide national estimates of the level of gross wage earnings of average workers in 2013. These estimates were not used (except for the countries listed above) because of potential inconsistency with the Secretariat estimates derived for other countries. However they are included in Table A.6 to enable comparisons to be made between the estimates obtained by applying the Secretariat formula and those from national sources. In most cases, the two categories are fairly close.

Table A.6. **Estimated gross wage earnings, 2012-2013 (in national currency)**

	Average wage 2012	Average wage 2013 (Secret. estimates)	Average wage 2013 (country estimates)	EO94 forecasted rates for 2013 ¹
Australia ²	73 494	74 978	77 530	2.0
Austria	40 708	41 693	41 824	2.4
Belgium	45 886	46 810		2.0
Canada	46 940	48 078	47 973	2.4
Chile ²	6 218 613		6 607 476	
Czech Rep.	302 993	298 770	310 694	-1.4
Denmark	392 000	395 722	393 910	0.9
Estonia ²	11 004		11 664	
Finland	41 662	42 493		2.0
France	36 248	36 980		2.0
Germany	44 300	45 170		2.0
Greece	22 240	20 604	19 558	-7.4
Hungary	2 838 864	2 914 514		2.7
Iceland	5 856 000	6 191 179		5.7
Ireland	32 514	32 381		-0.4
Israel	128 549	131 033		1.9
Italy	29 315	29 704		1.3
Japan	4 893 341	4 901 704		0.2
Korea	38 811 570	39 829 650	39 654 532	2.6
Luxembourg	51 752	52 902		2.2
Mexico	94 875	97 941	98 888	3.2
Netherlands	47 075	48 109		2.2
New Zealand ²	51 278		53 234	
Norway	504 929	524 177		3.8
Poland	40 205	41 442		3.1
Portugal	17 040	17 335		1.7
Slovak republic	9 810	10 015	10 004	2.1
Slovenia	17 538	17 611	17 500	0.4
Spain	25 894	26 027	25 802	0.5
Sweden	387 960	391 990	399 211	1.0
Switzerland	87 662	88 161		0.6
Turkey ^{2,3}	29 209		31 744	
United Kingdom	34 877	35 548		1.9
United States	47 960	48 463		1.0

1. Increase of compensation per employee in the total economy (Economic Outlook No 94).

2. The country AW estimate is used instead of the OECD Secretariat's AW estimate in the Taxing Wages calculations.

3. Turkey wage figures under the old definition of average worker (ISIC D, rev3.)

Table A.7 indicates the exchange rates and purchasing power parities of national currencies for 2013 that are used to calculate comparative earnings figures across countries in the report.

Table A.7. **Purchasing power parities and exchange rates for 2013**

	Monetary unit	Exchange rates ¹	Purchasing power parities
Australia	AUD	1.04	1.47
Austria	EUR	0.75	0.83
Belgium	EUR	0.75	0.83
Canada	CAD	1.03	1.23
Chile	CLP	495.28	347.97
Czech Rep.	CZK	19.56	13.30
Denmark	DKK	5.62	7.64
Estonia	EUR	0.75	0.55
Finland	EUR	0.75	0.91
France	EUR	0.75	0.84
Germany	EUR	0.75	0.78
Greece	EUR	0.75	0.65
Hungary	HUF	223.58	127.10
Iceland	ISK	122.17	137.94
Ireland	EUR	0.75	0.81
Israel	ILS	3.61	4.04
Italy	EUR	0.75	0.75
Japan	JPY	97.60	102.61
Korea	KRW	1094.93	846.08
Luxembourg	EUR	0.75	0.92
Mexico	MXN	12.77	7.83
Netherlands	EUR	0.75	0.83
New Zealand	NZD	1.22	1.46
Norway	NOK	5.88	8.80
Poland	PLN	3.16	1.80
Portugal	EUR	0.75	0.60
Slovak republic	EUR	0.75	0.51
Slovenia	EUR	0.75	0.60
Spain	EUR	0.75	0.68
Sweden	SEK	6.51	8.64
Switzerland	CHF	0.93	1.37
Turkey	TRL	1.90	1.08
United Kingdom	GBP	0.64	0.69
United States	USD	1.00	1.00

1. Average of 12 months daily rates.

6. Coverage of taxes and benefits

The Report is concerned with personal income tax and employee and employer social security contributions payable on wage earnings. In addition, payroll taxes (see Section 10) and in one case church tax (see Section 11) are included in the calculation of the total wedge between labour costs to the employer and the corresponding net take-home pay of the employee.

The calculation of the after-tax income includes family benefits paid by general government as cash transfers (see Section 12). Income tax due on capital income and non-wage labour income, several direct taxes (net wealth tax, corporate income tax) and all indirect taxes are not considered in this Report. However, all central, state and local government income taxes are included in the data.²

In this study, compulsory social security contributions paid to general government are treated as tax revenues. Being compulsory payments to general government they clearly resemble taxes. They may, however, differ from taxes in that the receipt of social security benefits depends upon appropriate contributions having been made, although the size of the benefits is not necessarily related to the amount of the contributions. Countries finance compulsory public social security programmes to a varying degree from general tax and non-tax revenue and earmarked contributions, respectively. Better comparability between countries is obtained by treating social security contributions as taxes, but they are listed under a separate heading so that their amounts can be identified in any analysis.

7. Calculation of personal income taxes

The method by which income tax payments are calculated is described in the country tables in Part III. First, the tax allowances applicable to a taxpayer with the characteristics and income level related to gross annual wage earnings of an average worker are determined. Next, the schedule of tax rates is applied and the resulting tax liability is reduced by any relevant tax credits. An important issue arising in the calculation of the personal income tax liability involves determining which tax reliefs should be taken into account. Two broad categories of reliefs may be distinguished:

- *Standard tax reliefs*: reliefs which are unrelated to actual expenditures incurred by the taxpayer and are automatically available to all taxpayers who satisfy the eligibility rules specified in the legislation. Standard tax reliefs are usually fixed amounts or fixed percentages of income and are typically the most important set of reliefs in the determination of the income tax paid by workers. These reliefs are taken into account in the calculations – they include:
 - The *basic relief* which is fixed and is available to all taxpayers or all wage earners, irrespective of their marital or family status;
 - The *standard relief* which is available to taxpayers depending on their *marital status*;
 - The *standard child relief* granted to a family with two children between the ages of six to eleven inclusive;
 - The *standard relief* in respect of *work expenses*, which is usually a fixed amount or fixed percentage of (gross) wage earnings; and,
 - Tax reliefs allowed for *social security contributions* and other (sub-central government) *income taxes* are also considered as standard reliefs since they apply to all wage earners and relate to compulsory payments to general government.³
- *Non-standard tax reliefs*: These are reliefs which are wholly determined by reference to actual expenses incurred. They are therefore neither fixed amounts nor fixed percentages of income. Examples of non-standard tax reliefs include reliefs for interest on qualifying loans (e.g. for the purchase of a house), private insurance premiums, contributions to private pension schemes, and charitable donations. These are not taken into account in calculating the tax position of employees.

Standard reliefs are separately identified and their impact on average tax rates is calculated in the results tables shown in the Country chapters. The latter include a brief description of the main non-standard reliefs in most cases.

8. State and local income taxes

Personal income taxes levied by sub-central levels of government – state, provincial, cantonal or local – are included in the scope of this study. State income taxes exist in Canada, Switzerland and the United States. Since 1997, Spain has an income tax for the Autonomous Regions. Local income taxes are imposed

in Belgium, Denmark, Finland, Iceland, Italy, Japan, Korea, Norway, Sweden, Switzerland and the United States. In Belgium, Canada (other than Quebec), Denmark, Iceland, Italy, Korea, Norway and Spain they are calculated as a percentage of taxable income or of the tax paid to central government. In Finland, Japan, Sweden and Switzerland, local government provides different tax reliefs from central government. In the United States, the sub-central levels of government operate a separate system of income taxation under which they have discretion over both the tax base and tax rates. Except for Canada, Spain and Switzerland, the rate schedule of these sub-central taxes consists of a single rate.

When tax rates and/or the tax base of sub-central government income taxes vary within a country, it is sometimes assumed that the average worker lives in a typical area and the income taxes (and benefits) applicable in this area are presented. This is the procedure followed in Canada, Italy, Switzerland and the United States where the tax base and tax rates vary very widely throughout the country. Belgium, Denmark, Finland, Iceland and Sweden have preferred to select the average rate of sub-central government income taxes for the country as a whole. No problem arises in Norway and Korea where the local rates do not vary in practice. Japan and Spain have used the widely prevalent standard schedule.

9. Social security contributions

Compulsory social security contributions paid by employees and employers to general government or to social security funds under the effective control of government are included in the coverage of this Report. In most countries, contributions are levied on gross earnings and earmarked to provide social security benefits. In Finland, Iceland and the Netherlands, some contributions are levied as a function of taxable income (i.e. gross wage earnings after most/all tax reliefs). Australia and New Zealand do not levy social security contributions.

Contributions to social security schemes outside the general government sector are not included in the calculations. However, information on “non-tax compulsory payments” as well as “compulsory payment indicators” is included in the OECD Tax Database, which is accessible at www.oecd.org/ctp/tax-database.

10. Payroll taxes

The tax base of payroll taxes is either a proportion of the payroll or a fixed amount per employee. In the OECD *Revenue Statistics* payroll taxes are reported under heading 3000. Fifteen OECD countries report revenue from payroll taxes: Australia, Austria, Canada, Denmark, France, Hungary, Iceland, Ireland, Israel, Korea, Mexico, New Zealand, Poland, Slovenia and Sweden.

Payroll taxes are included in total tax wedges reported in this publication, given that they increase the gap between gross labour costs and net take-home pay in the same way as income tax and social security contributions do. The main difference with the latter is that the payment of payroll taxes does not confer an entitlement to social security benefits. Also, the tax base of payroll taxes may differ from the tax base of employer social security contributions. For example, certain fringe benefits may only be liable to payroll tax. Because this Report presents the standard case, the payroll tax base is – depending on the relevant legislation – gross wage (excluding fringe benefits and other items of compensation that vary per employee), gross wage plus employer social security contributions, or a fixed amount per employee.

Four of the OECD member countries include payroll taxes in the *Taxing Wages* calculations: Australia, Austria, Hungary and Sweden. The other countries reporting payroll tax revenue in *Revenue Statistics* have not included these taxes in the calculations for the present Report for a variety of reasons.

11. Church tax

Some OECD Member countries impose a levy known as ‘church tax’, but only Denmark reports such revenues in the OECD *Revenue Statistics*. This is because the Danish State Church is classified as a part of general government. Denmark argues that this inclusion of the church in general government is appropriate because of the high degree of control that the government exercises over the church. Since the Working Party on Tax Policy Analysis and Tax Statistics has agreed that church taxes should be treated consistently in its two main statistical publications, only the Danish church tax is included in the calculations for *Taxing Wages*.

12. Family cash benefits from general government

Tax reliefs and family cash transfers universally paid in respect of dependent children between the ages of six to eleven inclusive who are attending school are included in the scope of the study. If tax reliefs or cash transfers vary within this age range, the most generous provisions are adopted, except that the case of twins is explicitly disregarded. Suppose the child benefit programme of a country is structured as follows:

Age group	Benefits per child
Children 6-8	100 units
Children 9-10	120 units
Children 11-14	150 units

The most favourable outcome arises in the case of 11-year old twins: 300 units. However, as the case of twins is excluded, the best outcome now becomes 270 units (one child 11 years old, one child 9 or 10 years old). This amount would be included in the country table. Often, the amount in benefits is raised as children grow older. The calculations assume that the children have been born on 1 January so the annual amount received in child benefits may be calculated from the benefit schedule that is in place at the start of the year with any revisions to these amounts during the year being taken into account.

Relevant cash payments are those received from general government. In some cases, the cash benefits include amounts that are paid without consideration to the number of children.

13. Payable tax credits

Payable (non-wastable) tax credits are tax credits that can exceed tax liability, where the excess, if any, can be paid as a cash transfer to the taxpayer. In principle, these credits can be treated in different ways according to whether they are regarded as tax provisions or cash transfers or a combination of these. A Special Feature in the 2001 edition of *Revenue Statistics* discusses these alternative treatments and the conceptual and practical difficulties that arise in deciding which is the most appropriate approach for the purpose of reporting internationally comparable tax revenue figures.⁴

Based on this review, the Interpretative Guide of the *Revenue Statistics* requires that

- only the portion of a payable tax credit that is claimed to reduce or eliminate a taxpayer’s liability (the ‘tax expenditure’ component)⁵ should be deducted in the reporting of tax revenues;
- the part of the tax credit that exceeds a taxpayer’s tax liability and is paid to him (the ‘cash transfer’ component) should be treated as an expenditure item and not deducted in the reporting of tax revenues.

However, additional information is provided in *Revenue Statistics* on aggregate tax expenditure components and aggregate transfer components of payable tax credits to show the effect of alternative treatments.⁶

The situation is different in *Taxing Wages* where the full amount of the payable tax credit is taken into account in the income tax calculation.

Strict consistency with the *Revenue Statistics* would require that only the tax expenditure component be offset against derived income tax, with the excess (if any) treated as a cash transfer. However, this approach would diminish rather than strengthen the informational content of the derived results in *Taxing Wages*. In particular, limiting tax credit claims to tax expenditure amounts would yield a zero income tax liability and zero average income tax rate where cash refunds are provided. Where tax credits claims are not constrained in this way, negative income tax liabilities and negative average income tax rates would result where cash transfers are provided. Arguably, these negative amounts more clearly convey the taxpayer's position (which is improved relative to the no-tax situation). Also, not including the cash transfer portion of payable tax credits in the 'cash transfers from general government' item of the country tables permits greater transparency of the latter which focuses on 'pure' cash transfers only.

However, in order to improve the informational content of country tables as regards payable tax credits, the memorandum item reporting at the bottom of the relevant country tables shows tax expenditure amounts on one line, with a second line showing cash transfer amounts. Where more than one payable tax credit program applies, the figures represent aggregates covering all the programs. Total program costs in each of the household cases considered can be derived by adding the tax expenditure and cash transfer amounts.

14. The calculation of marginal tax rates

In most cases, the marginal tax rates are calculated by considering the impact of a small increase in gross earnings on personal income tax, social security contributions and cash benefits. However, in the case of a non-working spouse, the move from a zero to a small positive income is unrepresentative of income changes and therefore of little interest. So, for this case, the marginal rates for the spouse are calculated by considering the impact of an income increase from zero to 33 per cent of the average wage.

2. Limitations

1. General limitations

The simple approach of comparing the tax/benefit position of example families avoids many of the conceptual and definitional problems involved in more complex international comparisons of tax burdens and transfer programmes. However, a drawback of this methodology is that the earnings of an average worker will usually occupy a different position in the overall income distribution in different economies, although the earnings relate to workers in similar jobs in various OECD Member countries.

Because of the limitations on the taxes and benefits covered in the Report, the data cannot be taken as an indication of the overall impact of the government sector on the welfare of taxpayers and their families. Complete coverage would require studies of the impact of indirect taxes, the treatment of non-wage labour income and other income components under personal income taxes and the effect of other tax allowances and cash benefits. Complete coverage would also require that consideration be given to the effect on welfare of services provided by the state, either free or below cost, and the incidence of corporate and other direct taxes on earnings and prices. Such a broad coverage is not possible in an international comparison of

all OECD countries. The differences between the results shown here and those of a full study of the overall impact on employees of government interventions in the economy would vary from one country to another. They would depend on the relative shares of different kinds of taxes in government revenues and on the scope and nature of government social expenditures.

The Report shows only the formal incidence of taxes on employees and employers. The final, economic incidence of taxes may be quite different, because the tax burden may be shifted from employers onto employees and *vice versa* by market adjustments to gross wages.

The income left at the disposal of a taxpayer may represent different standards of living in various countries because the range of goods and services on which the income is spent and their relative prices differ as between countries. In those countries where the general government sector provides a wide range of goods and services (generous basic old age pension, free health services, public housing, university education, etcetera), the taxpayer may be left with less cash income but may enjoy the same living standards as a taxpayer receiving a higher cash income but living in a country where there are fewer publicly provided goods and services.

As mentioned in Part O and detailed in the Special Feature of the 2005 edition of *Taxing Wages*, second earners who are earning 33 per cent of the average wage are very likely to be working part-time, although the *Taxing Wages* methodology generally assumes that they are working full-time. However, this only affects the accuracy of the results in *Taxing Wages* for one family type in Belgium (married couple where a second earner is earning 33 per cent of average wages). Therefore, one should be cautious when interpreting the results for this family type for Belgium. In addition, for all countries with hour-based rules, (see the 2005 Special Feature), caution should be used in applying the results in this Report to other household types.

2. Some specific limitations on the income tax calculation

The exclusion of non-wage income and the limited number of tax reliefs covered imply that the average rates of income tax in the tables in this publication will not necessarily reflect the actual rates confronting taxpayers at these levels of earnings. Actual rates may be lower than the calculated rates because the latter do not take into account non-standard expense-related reliefs. On the other hand, actual rates may be higher than calculated rates because the latter do not take into account tax on non-wage income received by employees.

The decision not to calculate separately average rates of income tax taking into account the effect of non-standard tax reliefs was taken because:

- In many cases, expense-related reliefs are substitutes for direct cash subsidies. To take into account these reliefs while ignoring any corresponding direct subsidies would distort comparisons of take-home pay plus cash transfers;
- The special tax treatment of certain expenses may be linked to special treatment of any income associated with these expenses (e.g. the tax treatment of social security contributions and pension income) which is beyond the scope of this study;
- A few countries were unable to estimate the value of these reliefs and even those countries which could do so could not limit their estimates to taxpayers with the characteristics assumed in the above part on methodology; and,
- Not all countries could calculate separately the reliefs available to different family-types. Where a split is provided between single individuals and families with children, there are large differences in the value of the reliefs typically received by these two categories of households.

3. *Limitations to time-series comparisons*

The Calculations of the tax burden on labour income in OECD countries reported in previous editions of *Taxing Wages*, including the 2004 edition, are based on an average earnings measure calculated for manual full-time workers in the manufacturing sector (the ‘average production worker’). From 1996 onwards there are time-series results covering all 8 family types, whereas there are results from 1979 onwards for two of these family-types: single individuals without children and married one-earner couples with two children with earnings equal to those of an average production worker.

Any analysis of the results has to take into account the fact that the earnings data do not necessarily relate to the same taxpayer throughout the period. The average earnings are calculated for each year. As such, the results do not reflect the changing earnings and tax position of particular individuals over time but rather to the position of workers earning a wage equal to average earnings in the covered industry sectors in each particular year. This, in turn, may mean that the earnings levels referred to may be at different points in the income distribution over the period covered and changes in tax rates may be influenced by these trends.

From the 2005 edition, *Taxing Wages* has reported tax calculations under a broadened average worker definition that includes all full-time employees covering industry sectors C-K (reference to ISIC Rev.3.1). The implications of adopting this new definition for time-series comparisons are discussed in the 2005 edition of *Taxing Wages*. As of the 2010 edition of the *Taxing Wages Report*, many countries have started reporting average wage earnings for full-time employees covering industry sectors B-N of the ISIC Rev.4 industry classification (which broadly corresponds to sectors C-K in ISIC Rev.3.1).

3. A Note on the Tax Equations

Each country chapter contains a section describing in a standard format the equations under-pinning the calculations required to derive the amounts of income tax, social security contributions and cash transfers. These algorithms represent in algebraic form the legal provisions described in the chapter and are consistent with the figures shown in the country and comparative tables. This section describes the conventions used in the definition of the equations and how they could be used by those wishing to implement the equations for their own research.

The earlier sections of the country chapters describe how the tax and other systems work and present the values of the parameters of those systems such as the levels of allowances and credits, and the schedule of tax rates.

In the first part of the equations section is a table showing a brief description of each parameter (such as “Basic tax credit”), the name of the parameter as used in the algebraic equation (“Basic_cred”) and the actual value for the relevant year (such as “1098”). Where there is a table of values – for example a schedule of tax rates and the associated thresholds of taxable income – a name is given to the entire table (for example “tax_sch”). These variable names are those used in the equations.

After the table of parameters is the table of equations. The four columns contain information as follows:

- The first two columns give a description and a variable name for the result of the equation on that row of the table. These always include the thirteen main financial value entries in the country

tables. Additional rows define any intermediate values which are calculated either to show the detail included in the tables (such as the subdivision of total tax allowances into the different categories) or values which make the calculation clearer.

- The third column shows the range of the calculation in that row. This is necessary to allow for the different way that tax may be calculated for married couples. The options are:
 - B The calculation is carried out separately for both the principal earner and the spouse using their individual levels of earnings. This applies in the case of independent income tax and usually also in respect of social security contributions.
 - P The calculation applies for the principal earner only. An example is where the principal earner can use any of the basic tax allowance of the spouse which cannot be set against the income of the spouse.
 - S The calculation applies for the lower earning spouse only.
 - J The calculation is carried out only once on the basis of joint income. This applies to systems of joint or family taxation and is also usual for the calculation of cash transfers in respect of children.
- The final column contains the equation itself. The equation may refer to the variables in the parameters table and to variables which result from one of the rows of the equations table itself. Use is also made of the two standard variables “Married”, which have the value 1 if the family consists of a married couple and 0 in the case of a single individual, and “Children” which denotes the number of children. Sometimes there is a reference to a variable with the affix “_total” which indicates the sum of the relevant variable values for the principal earner and the spouse. Similarly, the affixes “_princ” and “_spouse” indicate the value for the principal earner and spouse, respectively.

In the equations a number of functions are used. Some of these are used in the same way as in a number of widely available ‘spreadsheet’ computer packages. For example, MAX(X,Y) and MIN(X,Y) find the maximum and minimum of the two values, respectively. IF(condition X,Y) chooses the expression X if the condition is true and the expression Y if it is false. Boolean expressions are also used and are taken to have the value 1 if true and 0 if false. As an example, (Children=2*CB_2 is equivalent to IF(Children=2, CB_2,0).

There are also three special functions commonly used which denote calculations often required in tax and social security systems. These are:

- Tax (taxinc, tax_sch): This calculates the result of applying the schedule of tax rates and thresholds in “tax_sch” to the value of taxable income represented by “taxinc”. This function may be used in any part of the equations, not just in the income tax calculation. For some countries it is used for social security contributions or even for allowance levels which may be income dependent.
- Positive (X): This gives the result X when this value is positive and zero otherwise. It is therefore equivalent to MAX(0,X).
- Taper (value, income, threshold, rate): This gives the amount represented by “value” if “income” is less than “threshold”. Otherwise, it gives “value” reduced by “rate” multiplied by (income-threshold), unless this produces a negative result in which case zero is returned. This provides the calculation which is sometimes required when a tax credit, for example, is available in full

provided that total income is below a threshold but is then withdrawn at a given rate for each currency unit in excess of the threshold until it is withdrawn completely.

In some circumstances, there are country specific special functions. These functions involve programming that is designed to simplify the tax calculations. The programming underlying these functions is based on the description of the particular measure given in the relevant country chapter found in Part III. For example, the Earned Income Credit in the United States is calculated using the function called EIC.

Anyone wishing to make their own implementation of the equations will have to write functions corresponding to these special functions or make appropriate modifications to any equations that use them.

¹ Wage estimates reported in the *Economic Outlook* are consistent with information in the Analytical Data Base (ADB) of the Economics Department (ECO) of the OECD. These estimates are prepared by the ECO country desks. Data in the ADB/EO92 are consistent with the December 2012 issue of the *Economic Outlook*.

² Information on the fiscal powers of sub-central governments may be found in the publication *Taxing powers of state and local government*, OECD Tax Policy Studies No.1 (Paris, 1999).

³ In this case, the amount of tax relief is related to actual social security contributions paid by the employee or withheld from his wage – thus in this respect this item deviates from the general definition of standard tax relief under which relief is unrelated to actual expenses incurred.

⁴ OECD, *Revenue Statistics 1965–2000*, p. 28-31.

⁵ This characterisation must be viewed as informal, as the determination of tax expenditures requires the identification of a benchmark tax system for each country, or preferably, a common international benchmark. In practice it has not been possible to reach agreement on a common international benchmark for such purposes.

⁶ See Table D in the latest edition of OECD, Revenue Statistics.