

METHODOLOGY

Introduction

This paper details the various assumptions made in implementing the OECD Tax-Benefit models in order to calculate gross and net in-work and out-of-work incomes on a comparable basis across countries. The first section explains the reference periods used in the calculations and for expressing results. Section 2 outlines the assumptions made in calculating benefit amounts. Section 3 looks at the tax treatment of benefit income and earnings, and Section 4 introduces the income concept of the Average Worker (AW) earnings on which calculations are based. The latter two sections are kept relatively brief since a more detailed discussion can be found in *Taxing Wages 2015* (OECD, 2016). Section 5 outlines the treatment of regional differences in tax and benefit systems. Section 6 explains the work incentive indicators constructed from the model output and discusses how the various work incentive indicators published on www.oecd.org/els/social/workincentives relate to each other. Section 7 describes the types of family situation considered in the models.

1. Income definition and time-period issues

Only cash incomes are considered. Net incomes are gross earnings (see Section 3) plus cash benefits (Section 2) minus income taxes and own social security contributions (Section 4). Any taxes or contributions not paid directly by the wage earner or benefit recipient are not included in gross incomes (and not deducted to arrive at net incomes). Thus, cross-country comparisons do not capture differences in social security contributions paid by employers or benefit agencies except to the extent that they influence the AW average earnings measures (Section 6 below takes a closer look at the role employer contributions play in net replacement rate calculations). Housing costs and any other forms of “committed expenditure” are not deducted when computing net incomes. Childcare costs are only deducted in specific circumstances (see Section 2f).

All income measures relate to the current period and therefore do not take into account any longer-term effects of today’s labour market status on future earnings, pension entitlements, (re-)qualification for unemployment insurance benefits, etc. To the extent that individuals are aware of these future income implications and take them into account when considering their labour market status, it would clearly be desirable to allow for them when considering work incentives. Yet, this is beyond the scope of the static modelling framework. For low-income groups who frequently face liquidity constraints, current incomes may often, in any case, be the more immediate concern.

All tax and benefit amounts shown in the Tax-Benefit output are computed using the rules and regulation that were in force on 1 July of the relevant year, unless otherwise noted, in the individual country chapters. The same day is used as reference for the description of Tax-Benefit instruments (available at www.oecd.org/els/social/workincentives).

Taxes, benefits and net income values are determined for a particular month (*e.g.* the second month of unemployment benefit or social assistance receipt) but shown on an *annualised* basis (*i.e.* multiplied by 12) unless otherwise noted. In countries where irregular bonus payments are made

to support occasional or reasonable expenses (heating, buying Christmas presents, etc.), or where one-off lump-sum payments are designed to support people taking up a job (see sub-section on employment-conditional benefits), the total sum of these payments over the year is added to annualised regular incomes.

This approach has two implications. First, the annualised amounts of certain benefit values may exceed allowable annual maxima (*e.g.* unemployment benefits or in-work benefits that are available for less than 12 months). Second, income taxes, which depend on annual incomes, are determined in relation to the *annualised* amounts (*i.e.* the values for the particular month of interest multiplied by 12). Assuming unchanged income during the entire year has the advantage of being straightforward and informative in a situation where benefits can be received for at least 12 months. In cases where benefits are taxable *and* durations are shorter than 12 months, it is necessary to make an assumption about income earned in the remaining months. Taxing annualised values is, in this case, seen to be most consistent with the aim of determining taxes and benefits for a particular month. In addition, it is likely to be a reasonably good approximation of how authorities determine income tax pre-payments that are deducted at source in the month when income is earned. In effect, taxing annualised monthly values is equivalent to dividing all annual income tax parameters by twelve and taxing monthly incomes.

Since the aim of the model calculations is to provide an illustration of the tax-benefit rules *in a given year*, any time-lags delaying (*e.g.* for administrative reasons) the assessment of claimants' entitlement or the payment of benefits are disregarded. All differences in the timing of benefits (*e.g.* whether they are paid in arrears or in advance) are ignored as well. For instance, where social assistance benefits payable in the current year depend on previous year's net income, they are, instead, computed based on the family's current income situation. Thus income instantaneously affects benefits, rather than affecting them after some period of time. Unemployment benefits often depend on previous gross earnings. In the model calculations, these benefits are computed in relation to a specific percentage of AW earnings using the AW value for the current (rather than the previous) year. Where previous net earnings are the basis for benefit entitlements, relevant taxes are computed using the current year's tax rules.

2. Benefit assumptions

a) Benefits included

Benefits included in the calculations exclude benefits "in-kind". Hence free school meals, subsidised transport, free health care, etc. are not included. In general, occasional or irregular payments are not included. Also excluded are benefits strictly related to the purchase of particular goods and services (other than housing or childcare as described below), reduced price transport or purchase of domestic fuel, medical insurance or prescriptions. An exception is made for food stamps in the United States, as these are considered to correspond closely to cash social assistance benefits paid in other countries.

Cash benefits considered include unemployment insurance, unemployment assistance, social assistance, family benefits and lone-parent benefits, housing benefits, child-raising allowance paid to parents assuming childcare responsibilities for their own children and employment-conditional (or "in-work") benefits. Childcare benefits for parents with children in externally provided childcare and the costs of that care have been introduced into the models but are not implemented for standard outputs. Benefits excluded are, amongst others, old-age cash benefits, early retirement benefits, sickness, invalidity and occupational injury benefits and benefits relating to participation inactive labour market policies. Also excluded are payments made to those unemployed as a result of collective

dismissal, such as the *Cassa Integrazione Generale* (CIG) and mobility benefits in Italy (prior to their replacement by the *Assicurazione Sociale per l'Impiego* (ASPI), from 2013). Severance pay, even where legally required of employers, is not included. The table “Policies included in the model, 2015”, available on <http://www.oecd.org/els/benefits-and-wages-policies.htm>, provides a summary of benefits and tax concessions included in the model for each country.

b) Unemployment insurance

Unemployment insurance entitlement can be considered in three parts: the conditions for being entitled to benefit; the amount of benefit to which a person is entitled; and the length of benefit duration.

The standard assumption is that the benefit recipient is 40 years old and has been employed full-time continuously and contributing to the unemployment insurance fund since the age of 18. This means that in most countries the individual has a full contributions record in the period before unemployment; that where insurance is voluntary (as in some Nordic countries), the individual considered has contributed to the fund; and that the individual falls into the “standard” unemployment insurance system (older workers are often eligible for a longer duration of benefit receipt). This assumption means that in virtually every case the individual is entitled to unemployment insurance, where such insurance exists.

The amount of insurance benefit is often based on previous earnings. The level of previous earnings is defined with reference to the AW level of earnings in the current year. It is assumed that the stated proportion of this level of earnings has been earned over whatever period upon which assessment for benefit is calculated. Where minimum or maximum levels of benefit are included in benefit regulations, these are applied. The individual is generally assumed to be fully unemployed but special rules for part-time work during unemployment are applied if relevant to the calculations (as in the case of some “budget constraint” graphs, available at www.oecd.org/els/social/workincentives, showing the income consequences of part-time work for a recipient of unemployment benefits). If supplements are paid reflecting the family situation of the unemployed person (*e.g.* for dependent spouses or children), these are included. Benefits are sometimes reduced after a period of receipt. The reductions may be related to age and/or contributions record. Such reductions are applied as appropriate, using the assumptions about age and contributions record given in the previous paragraph.

For the calculations of replacement rates over a five-year period, the individual is assumed to receive the benefit for the length to which he or she is legally entitled. This implies that the individual satisfies whatever requirements for actively seeking work are imposed throughout the period of legal entitlement. In some countries there is a right to enter an active labour market programme (training, subsidised employment, etc.) after a certain period of unemployment. The individual is assumed not to participate in such schemes. Hence, even where participation in such schemes can re-qualify an individual for an insurance benefit and benefit receipt is in effect indefinite, the individual is assumed to exhaust benefit according to the *de jure* rather than the *de facto* duration of benefit receipt. Special rules for temporary layoffs are not included.

c) Means-tested benefits

This section considers the assumptions made where cash benefits are means-tested, particularly for unemployment assistance and social assistance.

Means-tested benefits are usually paid only when the assets of a family are less than a certain level, and are reduced as the income of the individual or family increases. The exact details of how these two features apply in each country vary greatly. Furthermore, social assistance benefits are often discretionary and the level is decided locally. Hence, eligibility assumptions can have a great effect on the benefit income which those out of work are indicated as receiving. The general assumptions applied are the following:

- Entitlement to means-tested unemployment assistance and labour market support programmes may **depend on age and employment and/or contributions record**. Where this is the case, the assumptions outlined in the section on unemployment insurance are applied. Similarly, employment activity and duration of benefit are as described in that section.
- Social assistance may only be paid where all other sources of support have been exhausted. In cases where the **extended family may have a legal duty to support those without resources** it is assumed that no such support is forthcoming.
- **Savings and other types of assets** must often be below some level for there to be entitlement to benefit. The assets ceiling may be relatively high (several hundred thousand dollars, excluding the value of housing in Australia) or very low (often requiring sale of housing and even of cars). For calculations where social assistance amounts are explicitly included (see notes to the tables and figures), it is everywhere assumed that the family possesses negligible assets, and qualifies for the benefit subject to relevant income and other eligibility conditions.
- Benefits are reduced as family or individual income increases. Hence families with **other sources of income** (capital, alimony) may get reduced means-tested benefits. It is everywhere assumed that the family has no sources of income other than from benefits and/or employment.
- Social assistance in some countries may impose **conditions on the behaviour of spouses**. For example, in Sweden it is necessary for both spouses to be searching for work for entitlement conditions for social assistance to be satisfied. In Australia, each spouse has an individual entitlement to benefit, with individual activity requirements required. In these cases, it is assumed that both spouses fulfil all requirements for full social assistance benefits to be received.
- Social assistance provisions often **vary geographically**, and benefit officers or caseworkers also have some discretion when deciding upon entitlements. Where benefit amounts have been set in national regulations, these have been used. Even where there is local discretion, there are often national guidelines. These guidelines have been used where available. In other cases, “typical” rates for each family type have been used (e.g., rules applying in the capital city). A full listing of social assistance amounts, and whether they are based on national rates, national guidelines or typical regional rates, is given in the policy overview table for Social assistance available on www.oecd.org/els/social/workincentives.
- Social assistance may be used to **“top up” other income sources**, including earnings and insurance benefits, where these are below the level of social assistance. For countries where relevant information has been received, this is also indicated in the policy overview table for Social assistance.

- In some countries the means-test is reduced in amount or removed altogether for payments made to beneficiaries **participating in active labour market policies**. Such schemes are not considered. Consequently, additional benefits paid conditional on participation in active labour market programs are not taken into account.

d) Housing benefits

Housing benefits are included where they consist of a cash benefit paid to individuals with low incomes or who are unemployed and who are living in private rented accommodation. Housing benefit may consist of a general means-tested benefit which supplements other benefits, or it may consist of special rules concerning the treatment of housing costs in the calculation of social assistance levels, or there may be the two types of system running in parallel. In the United Kingdom, Council Tax Benefit (available in Great Britain only) is excluded (as is Council Tax).

Subsidies for the construction of housing, purchases of owner-occupied housing, subsidies for the interest payments on owner-occupied housing, and other similar payments are not included. Similarly, the assumption of living in private rental accommodation means the benefits in kind provided by social housing, usually involving rents below the market rate, are not taken into account in the comparative tables.

Housing benefits are often very complex. A very simple assumption has been applied in the models, which has to be taken into account when interpreting the results. It is assumed that families live in privately rented accommodation and the level of rent for all family types regardless of income level and income source is 20% of the gross earnings of an average worker. Where size is relevant, it is assumed to be 70 square metres. (Country specific assumptions, where required, are indicated in the country chapters available on www.oecd.org/els/social/workincentives.)

This implies:

- Single persons are assumed to pay the same rent as a couple with two children.
- Special rules (*e.g.* social assistance for non-rent-related housing costs, such as water and electricity) are not explicitly covered.
- A household living on social assistance is assumed to be paying the same rent as a similar household with average or above-average earnings.
- A household does not adjust its housing consumption according to income level, an assumption which is valid for the short-term unemployed, but less so for those households which have been without work for an extended period.

The 20% of AW used approximates the average level of housing consumption across the OECD. In some countries, however, housing costs can differ from this level, sometimes by substantial amounts. Furthermore, actual households without work will presumably on average spend less than this amount (reflecting their recognition of lower long-term consumption possibilities than more employable households, and also the effects of regional concentrations of unemployment on housing costs), and households with work will (again, on average) spend more. The housing cost assumption may not therefore reflect the typical housing costs of those living on benefit income in each country. It is justified on the grounds that, first, no practical alternatives are obviously preferable, and second, that it is transparent and easily understood. Any assumption other than fixed housing costs for those in-work and out-of-work would make interpretation of replacement rates difficult.

Where housing benefits vary by area, a typical rate has been chosen. Assumptions concerning means-testing are as in sub-section *c* above. In some circumstances it is desirable to exclude Housing benefits from the net income calculation so this feature has been built into the model.

e) Family benefits

Family benefits may be unrelated to the incomes of the family or means-tested. Where they are means-tested, the assumptions given in the previous section are applied. Benefit amounts are often related to the age of the child; the standard tables relating to families with children, such as those contained in the country tables available on www.oecd.org/els/social/workincentives, are based on the assumption of two children aged four and six. Where different assumptions have been made, the number of children and the amounts relevant for the ages are given in the footnotes to the tables. Where receipt of family payment is conditional on certain behaviours, such as ensuring school attendance, immunisation or compliance with particular checks these requirements are assumed to be satisfied.

f) Childcare benefits

All standard results assume that no childcare services are used and families are therefore not entitled to any benefits or tax reductions that depend on certain levels of childcare expenditures or on utilising certain types of childcare services. Childcare fees and the rules and regulations that determine the extent to which governments support parents in meeting the cost of formal childcare have been introduced into the models for most countries. This capacity has been used to estimate household net incomes which include childcare benefits and are reduced by childcare costs for 2004, 2008 2012 and 2015.

Any benefits or tax reductions that are not subject to these conditions are assumed to be available as long as other relevant criteria are met (*e.g.* children's ages, family income). Childcare benefits paid to parents looking after their children at home (child-raising allowances) are also available subject to relevant conditions (*e.g.* number of working hours).

g) Lone-parent benefits

It is assumed that lone parents do not receive any alimony from the absent parent. Where receipt of benefit depends in part on co-operation with official attempts to identify the absent parent, it is assumed that such co-operation has been forthcoming. Regular lone-parent benefits as well as payments of alimony advances paid by state or local authorities are taken into account, but benefits or advances that are only available to for a defined period on becoming a lone parent are not considered. No other special transfers (*e.g.* widow's pensions) are assumed to be received, except for the benefits considered in this publication. Any means-tests are applied following the guidelines in sub-section *c*.

h) Employment-conditional benefits

Employment-conditional (or in-work) benefits may be paid via either the tax administrative system (as in New Zealand, the United Kingdom and the United States) or that of the benefit system (as in Ireland). Both types of payment are considered benefits for the purpose of this report. Such benefits are paid only to those with earnings or those who have worked more than a certain number of hours per week. They do not therefore affect incomes of those families out of work. They do affect the incomes of those working part-time, however, and the assumptions about hours worked and incomes earned determine the level of employment-conditional benefits. Delays in payment of benefit (which are often long – most recipients in the United States receive the payment in arrears at year-end) are

ignored, with benefit income being calculated as it accrues. Means-testing provisions are applied following the principles given in sub-section *c* above, and are annualised as described in Section 1. Some in-work benefits are only available following a recent transition into employment (“into work” benefits). Where this is the case, these benefits are taken into account in calculating net incomes only where a transition into employment is assumed to have taken place. Recurring into-work benefits that are paid during at least two payment periods are calculated for the second month of employment in the new job and then annualised as described in Section 1 (i.e., multiplied by twelve). Lump-sum into-work benefits that are (i) paid as a *one-off* transfer upon taking up a job, or (ii) conditional on maintaining employment for a certain number of months, are added to annualised net incomes (i.e., they are not attributed to any specific month but to the year as a whole). They are calculated on the assumption that employment in the new job will continue.

3. Assumptions about earnings

Gross earnings in-work are expressed as a percentage of earnings of the average worker (AW). Details of how the AW earnings are calculated in each country can be found in *Taxing Wages* (OECD, 2016). The broad guidelines are as follows:

- Earnings are calculated for Sectors B to N inclusive of the ISIC Rev. 4 industry classification for most countries. This classification broadly corresponds to sectors C to K inclusive of the International Standard Classification of all Economic Activities (ISIC Rev.3.1, United Nations, New York, 1989) which is still used for some countries.
- Data relate to the average earnings for the country as a whole.
- The worker is an adult (male or female) worker in the covered industry sectors, including both manual and non-manual workers. Some countries are not able to provide averages that include supervisory and/or management employees.
- The worker is assumed to be fully employed during the year, although several countries are unable to separate and exclude part-time workers from the earnings figures (in most of these cases, full-time equivalent wages are reported).

Annual earnings are calculated 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 is used to calculate overtime earnings. Earnings are assumed to include average amounts of overtime and regular cash supplements (Christmas bonuses, thirteenth month payments and vacation month payments). Regular annual bonuses are included where they do not take the form of dividend payments. Fringe benefits are excluded. As a result of data limitations, average wages reported by Turkey depart from the common “average worker” definition still referring to manual workers in manufacturing (industry sector D). (This is the average production worker (APW) wage used as the benchmark prior to the 2007 edition of *Benefits and Wages* (OECD, 2007a)). The reasons for moving to a broadened average wage definition are provided in the Special Feature of Taxing Wages 2003-2004 (OECD, 2005) and an analysis of the effect of moving to the new broader definition for the Tax-Benefit modelling can be found in Box A.1 of Annex A (OECD, 2007a).

AW values, 2001 – 2015, currently used as the Tax-Benefit model benchmarks are available on the Tax-Benefit model website, under ‘Models’ - <http://www.oecd.org/els/benefits-and-wages.htm>.

4. Assumptions about taxation

This section gives a brief discussion of the assumptions used in calculating the tax due on earnings and benefits. The calculations of tax payments are based on the models used for Taxing Wages (www.oecd.org/ctp/taxingwages). These have been modified or extended where different or additional tax rules apply to the unemployed, to benefit recipients or to people earning income below 67% of AW.

Only personal income tax and employees' social security contributions payable in respect of earnings and benefits are included. Social security contributions made to the private sector are excluded, except when required by law (as in Finland or Iceland). Central, state and local government income taxes are included. Council tax in the United Kingdom is excluded.

In general only standard tax reliefs are included when calculating tax payments. These reliefs are unrelated to actual expenditures incurred by the taxpayer and are automatically available to taxpayers who satisfy the eligibility rules specified in legislation. Typical standard reliefs include the basic reliefs available to all taxpayers, or wage earners, or benefit recipients, irrespective of family status; standard reliefs available to taxpayers depending on their marital status; standard reliefs granted to families with children (where relevant); and the standard relief relating to work-related expenses.

Non-standard reliefs are not included. Non-standard reliefs include those relating to costs of owner-occupied housing, relief for interest on qualifying loans, insurance premiums, contributions to savings' or pension plans, purchase of medical insurance, and charitable donations. An exception to this rule occurs when non-standard reliefs contain a "minimum benefit" clause, *i.e.* when the benefit is equal to the larger of some fixed amount or actual expenses. In these cases the benefit is taken as the fixed amount.

5. Treatment of regional differences

Several of the assumptions given above refer to how regional differences in tax and benefit systems have been taken into account. The broad principles are as follows:

- Where regional variations consist of deviations from general national guidelines which would otherwise apply, these are not taken into account. Hence, for example, extensions of unemployment benefit duration in high unemployment provinces and states in Canada and the United States are only considered when the national guideline takes account of the regional unemployment rate.
- Where regional variations arise as a result of regional or local autonomy in setting regulations, three alternatives could be applied: the average of the different local regimes, the regime applying in a particular region which can be considered to be typical, or national "guideline" rules.

Eight countries have regionally varying tax systems (four others – Korea, Japan, Norway and Spain – have local income taxes which do not, however, vary). In Denmark, Finland, Iceland, Spain and Sweden it is possible to calculate a weighted average of the single rate which applies in each area to a tax base which does not differ significantly from that of the central government tax system. This is used in the calculations of in-work and out-of-work net incomes. In Belgium, Canada, Switzerland and the United States calculation of such an average rate is not possible. Typical rates are used instead; the

maximum permitted rate for Belgium, and the rates applying in Zurich (Canton and Commune) for Switzerland and the rates applying in the state of Michigan for the United States and the province of Ontario in Canada.

Information making it possible to calculate country-wide average benefit payments is not available to the same degree, and typical cases are more commonly used. Variations in rates are typically found for social assistance and housing benefits. Where typical rates are used for the tax calculations, the benefit system in that region has been followed for consistency. Note that the assumptions about housing costs mean that variations in housing costs across different regions are ignored.

6. Work-incentive indicators

a) Marginal effective tax rate (METR)

An indicator that can be used for measuring the extent to which taxes and benefits reduce the financial gain from work is the marginal effective tax rate (METR). This indicator measures what part of any additional earnings is “taxed away” through the combined effect of increasing tax and decreasing benefit. In other words, the METR measures the effective tax burden to which the additional earnings are subject to. Formally, we have:

$$METR = 1 - \frac{\Delta y_{net}}{\Delta y_{gross}} \quad [A1a]$$

Where Δy_{gross} are the “additional earnings” referred to above and Δy_{net} is the change in net income obtained after taxes and benefits so that the change in gross earnings between labour market states A and B is:

$$\Delta y_{gross} = y_{grossB} - y_{grossA} \quad [A1b]$$

and the change in net income is:

$$\Delta y_{net} = y_{netB} - y_{netA} = (y_{grossB} - t_B + b_B) - (y_{grossA} - t_A + b_A) \quad [A1c]$$

where t denotes total taxes and b denotes total benefits.

The earnings change Δy_{gross} can relate to a large or small change of working hours and/or hourly wages. METRs, calculated for a range of working hours transitions for somebody already in employment, can be used to identify low-wage traps.

b) Participation Tax Rate (PTR)

NB - This indicator has previously been referred to as the Average Effective Tax Rate. In addition, this same type of indicator can also be used to analyse the income consequences of transitions between employment and non-employment, in which case the change is equal to total earnings. In order to keep the notation consistent with previous editions of Benefits and Wages, the METR for a transition into work is called PTR (*previously referred to as AETR*) since it relates to a discrete transition between non-employment and employment rather than a “marginal” income change. Its definition is equivalent to [A1] with labour market state B being “in work” (IW) and labour market state A being “out of work” (OW):

$$PTR = 1 - \frac{\Delta y_{net}}{\Delta y_{gross}} = 1 - \frac{y_{netIW} - y_{netOW}}{y_{grossIW} - y_{grossOW}} \quad [A2]$$

As on www.oecd.org/els/social/workincentives other studies refer to the PTR as “Unemployment Trap” ($METR_{UT}$) indicator for transitions from unemployment to employment and as “Inactivity Trap” ($METR_{IT}$) indicator for a transition into work from inactivity without unemployment benefits (Carone *et al.*, 2004), and also as “Participation Tax Rate” (Immervoll *et al.*, 2004) or “Tax-Benefit to Earnings Ratio” (Immervoll and O’Donoghue, 2003). The PTR should not be confused with the effective tax burden or “tax wedge”, which is often shown as a percentage of gross earnings for a particular employee and does not relate to transitions between different work situations.

c) Net replacement rate (NRR)

The other measure, published on www.oecd.org/els/social/workincentives, to analyse the effects of labour market transitions on household incomes is the net replacement rate (NRR), usually defined as the ratio of net income while out of work divided by net income while in work:

$$NRR = \frac{y_{netOW}}{y_{netIW}} \quad [A3]$$

The NRR measures the fraction of net income in work that is maintained when becoming unemployed.

d) Relationship between PTR and NRR

The OECD Tax-Benefit models assess all incomes y at the household level with one person changing between status A and B (or OW and IW) while the work status and earnings of all other household members remain unchanged. In the case of computing the NRR for a two-earner couple, this means that the earnings of the partner whose earnings remain unchanged will, to a large extent drive the NRR results since these unchanged earnings appear in both the numerator and denominator of [A3]. While the degree of income maintenance as expressed by the NRR is a useful indicator regardless of the number of earners in the household, the PTR is a better indicator of the *influence of the Tax-Benefit system* on financial work incentives. It relates the change in net household income to the *change* in gross earnings and is therefore not directly affected by the level of any earnings received by other household members.

For an unemployed person who is single or lives in a household where nobody else has any income from work, there is a straightforward relationship between the PTR and the NRR: for those with high NRRs, net incomes during unemployment are not much lower than during employment. When moving back into work, they will thus tend to see only small increases in net income and, hence, have high PTRs as well. This direct link between NRR and PTR is most easily seen in the case of $NRR=PTR=1$ (in general, $NRR \neq PTR$).

To show the relationship between NRR and PTR formally, one can combine [A3] with [A2] and rearrange to obtain:

$$NRR = 1 - \frac{\Delta y_{gross} (1 - PTR)}{y_{netIW}} \quad [A4]$$

For a transition into work, the numerator of [A4] is the part of in-work earnings that is not “taxed away” (and is thus equal to Δy_{net}).

e) ***Employers’ social security contributions and comparability of indicators across countries***

Social security contributions paid by employers (SSC_{er}) can be substantial and the relative importance of taxes and contributions paid by employers and employees differs markedly across countries (see OECD, 2007b). Since SSC_{er} are not considered in the calculations presented here, it is useful to consider how they might affect the comparability of results. A first consideration is whether the insurance value or any future benefits bought by social security contributions should be taken into account in the calculations. As explained above, while taking into account future income streams may be desirable, the static modelling employed in the modelling considers current incomes only. A second, and separate, issue concerns the incidence of social security contributions. To the extent that SSC_{er} reduce wages, they might usefully be considered a tax on employees. Similarly, any part of employee contributions that is incident on the employer may not be considered as reducing employees’ take-home pay. However, any “forward” or “backward” shifting of contribution payments will take place via adjustments to contractual wages. If AW values are measured in an equilibrium situation where these adjustments have taken place, then any wage adjustments will already be reflected in the average wage figures used as the basis for the calculations. Given the concern with current cash incomes (and, in particular, take-home pay in the case of employed persons), it is therefore appropriate to fully deduct employee contributions when computing net incomes. Similarly, any parts of SSC_{er} that may be incident on employees should not be deducted (since these will already be reflected in lower AW values).

The relevant mechanisms can be illustrated as follows. To the extent that contributions are incident on employees, higher employer SSC_{er} will, other things being equal, result in lower contractual wages. What does this mean in terms of the measurement of financial work incentives using the current cash income concept as in this publication? If SSC_{er} are raised from zero to X and a fraction of $0 \leq s \leq 1$ of X is shifted to employees, then average wages w will, by definition, decrease by sX . Once this adjustment process is complete, the NRR for a single person earning the average wage might be $b / ((1-t)(w-sX))$, where b is the net unemployment benefit, t is the individual’s average tax rate while in work and w is the average wage prior to the SSC_{er} increase. This is the same NRR one would obtain if, instead of raising X through employer contributions, employees would pay contributions of X : they would only end up paying sX with the remainder of X shifted to employers. It is clear, therefore, that once the forward or backward shifting of contributions is complete, the current cash income concept results in the same NRR measures regardless of whether contributions are paid by employees or employers. Subject to the assumptions that the shifting processes are complete and given the modelling focus on cash incomes, the PTR and METR measures are conceptually consistent in that they measure the effective tax burden to which the additional *earnings* are subject and on this basis are comparable across countries with different levels of employer and employee contributions.

Given that employer SSC vary substantially between countries rankings across countries are likely to change when PTRs and METRs are calculated accounting for employer SSC (by including employer SSC in the denominator of equation [A1]). In general, the measured METR will be higher across earnings ranges where SSC_{er} increase and this change will be greater the larger the change in employer SSC. METRs calculated in this way, however, need to be interpreted as marginal effective tax rates on *labour costs* rather than on *gross earnings* and do not have the same clear focus on current cash incomes (as that part of gross income represented by SSC_{er} is not attainable in cash by the employee). It is also important to keep in mind that they are based on current income concepts and therefore do not take into account country differences in the rights to future incomes or services bought by social security contributions.

7. Family situations used as the basis for tax-benefit calculations

The use of “typical” households allows many of the determinants of tax and benefit amounts to be held constant while changing one household characteristic (*e.g.* the number of children) at a time. A focus on one aspect at a time helps improve our understanding of existing policy instruments as well as the differences between them across countries and at different points in time. These types of result thus provide a useful complement to population-based approaches such as incidence studies based on micro-data alone or microsimulation models capable of simulating the effects of fiscal and social policy instruments on a sample of actual households.

Computing tax and benefit amounts using existing policy rules illustrates the features of these instruments. And by repeating these calculations for a number of different household situations, they permit an assessment of the circumstances (*e.g.* family situation or income level) for which each of these features becomes relevant.

Standard results published on www.oecd.org/els/social/workincentives (taxes, benefits and net incomes) are computed for a set of different family types:

1. Single adult without children
(employed/unemployed)
2. Lone parent with two children
(employed/unemployed)
3. One-earner married couple
(first spouse employed/unemployed, second spouse “inactive”)
4. One-earner married couple with two children
(first spouse employed/unemployed, second spouse “inactive”)
5. Two-earner married couple
(first spouse employed/unemployed, second spouse full-time employed)
6. Two-earner married couple with two children
(first spouse employed/unemployed, second spouse full-time employed)

The standard assumption is that adults are 40 years old and children are aged four and six. The age assumption for adults allows cross-country comparisons of maximum amounts of unemployment benefits, which may depend on age or contribution records (see Section 2b above). For each of these family types, net incomes are determined for a range of different earnings levels and/or working hours. The resulting indicators therefore cover a large number of family, labour market and income situations and provide a broad picture of how taxes and transfers potentially affect the incomes of different population sub-groups.

Yet, typical cases can never be fully representative of the actual situation in a particular country. This point is particularly relevant when comparing results across countries as certain family situations (such as lone-parenthood or two-earner families) may be much more common in one country than in others. Similarly, the earnings distribution will differ so that various percentages of AW will be more or less common across countries and for different family types (a study of the representativeness of the APW was carried out in OECD, 1999).

8. Comparing with earlier results

The results in the website are not strictly comparable with those reported in published editions of Benefits and Wages (OECD, 2002, 2004 and 2007a). This is first due to the change in the average wage benchmark from average production worker (APW) to average worker (AW). Second, for some countries, calculation models for some or all years between 2001 and 2014 have been revised in line with clarifications received from country experts and/or AW estimates have been revised. As current estimates, for all years, are contained in the series available www.oecd.org/els/social/workincentives they should be used for comparisons over time.

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