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No. 18

**Indicators of Unemployment
and Low-Wage Traps:
Marginal Effective Tax Rates
on Employment Incomes**

**Giuseppe Carone,
Herwig Immervoll,
Dominique Paturot,
Aino Salomäki**

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(Marginal Effective Tax Rates on Employment Incomes)

Giuseppe Carone, Herwig Immervoll,
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SUMMARY

1. This paper presents results from an on-going joint European Commission / OECD project, aimed at monitoring the direct influence of tax and benefit instruments on household incomes. The project uses and extends OECD tax-benefit models to compute a range of work incentive indicators such as marginal effective tax rates on earned income. This paper provides a methodological background describing these extensions. It also discusses the usefulness of a range of indicators such as net replacement rates and marginal effective tax rates and to what extent they can be used to quantify possible work disincentives. The approaches are illustrated using detailed tax-benefit calculations for 2001 and comparing relevant indicators across 15 EU and 8 non-EU countries.

2. The results presented in this paper permit the identification of family circumstances where (1) financial incentives to increase work are either small or missing altogether; or (2) resources provided by social transfers may be inadequate. The analysis of how benefits and taxes depend on work status and earnings levels does not, by itself, tell us how changes in tax-benefit policy will actually influence labour supply or how many individuals live in income poverty and why. It does, however, contribute to a thorough understanding of the mechanics of tax-benefit systems. This understanding of how different tax-benefit instruments interact with each other, as well as with people's particular labour market and household situations, is an essential pre-requisite for identifying tax-benefit reform priorities.

RESUME

3. Cette étude présente les résultats d'un projet commun Commission européenne/OCDE qui vise à faire apparaître l'impact direct des mécanismes fiscaux et de prestations sur le revenu des ménages. Le projet utilise, en les élargissant, les modèles fiscalité-prestations de l'OCDE pour calculer divers indicateurs de l'incitation à l'activité tels que le taux marginal effectif d'imposition des revenus du travail. Cette étude donne, par ailleurs, des indications méthodologiques sur la façon dont il a été procédé. On examine aussi la pertinence de différents indicateurs tels que le taux de remplacement net et le taux marginal effectif d'imposition, et on cherche à voir dans quelle mesure ils peuvent permettre de mesurer d'éventuels effets décourageants vis-à-vis de l'activité. A des fins d'illustration, on présente des calculs détaillés impôts-prestations pour 2001 et on procède à des comparaisons d'indicateurs pertinents dans les 15 pays de l'UE et 8 pays non membres de l'UE.

4. Les résultats présentés dans cette étude permettent d'identifier les circonstances familiales dans lesquelles (1) les incitations financières à accroître son activité sont ou bien faibles ou bien totalement absentes ; ou dans lesquelles (2) les ressources apportées par les transferts sociaux sont insuffisantes. L'analyse de la façon dont les prestations et la fiscalité dépendent du statut au regard de l'activité et du niveau de revenu ne nous dit pas, en soi, comment les changements dans la politique fiscale-de prestations influenceront, concrètement, sur l'offre de travail, ni combien d'individus vivent dans la pauvreté et pourquoi. Elle contribue, toutefois, à une compréhension approfondie des mécanismes des systèmes fiscaux-de prestations. Une bonne compréhension de la façon dont les différents instruments fiscaux-de prestations interagissent entre eux et interagissent avec la situation au regard du marché du travail et la situation familiale des individus est un préalable indispensable pour déterminer les priorités des réformes en matière de fiscalité et de prestations.

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I. INTRODUCTION

5. This paper presents results from an on-going joint European Commission / OECD project,¹ aimed at monitoring the direct influence of tax and benefit instruments on household incomes. The project uses and extends OECD tax-benefit models to compute a range of work incentive indicators such as marginal effective tax rates on earned income. Given a widespread concern about possible adverse effects of taxes and benefits on unemployment levels, it has become increasingly important to regularly assess both the financial incentives to work and the degree of protection from unemployment-related poverty risks. Indicators of financial work incentives are needed for identifying any undesired influences of taxes and social transfers on people's work decisions. At the same time, a central part of many recent tax and welfare reform strategies has been to reduce reliance on welfare by "making work pay", that is, to make work an economically attractive option relative to welfare. It is therefore desirable to monitor the effects of such policies as well as the potential for further reform.

6. It is important in this context to distinguish between "incentives" and "incentive effects". While measuring financial work incentives is an integral part of any tax-benefit policy evaluation exercise, employment levels, unemployment rates and total hours worked are not determined exclusively by the size of benefits and the taxes needed to finance them. First, a lack of suitable jobs can give rise to involuntary unemployment which will persist to the extent that the legal and institutional framework prevents wage-adjustment mechanisms from aligning supply and demand. Secondly, numerous non-financial considerations will play a role in the decision of whether and how many hours to work. In addition, any change in labour supply as a result of tax-benefit policy differs across population groups so that small changes in total labour supply may mask important changes for certain groups of individuals. Given these factors and the different roles they are likely to play across countries, it is perhaps not surprising that empirical results of the effects of taxes and benefits on total unemployment differ considerably across studies.²

7. The evidence is somewhat clearer when one restricts the analysis to one side of the labour market. Microeconomic studies of the sensitivity of labour supply with respect to changes in net income (and, thus, taxes and benefits) generally find small elasticities for men and frequently also for the population as a whole. Estimates are, however, much larger for certain groups of people such as secondary earners (mainly married women) or single parents.³ It is clear, therefore, that looking at how tax-benefit policy might influence the opportunity set of a single "average person" will not generally suffice. Instead, it is desirable to analyse how taxes and benefits affect people living in different household circumstances and with a range of different earnings levels.

8. To obtain a fuller picture of the financial consequences of work and unemployment this paper will therefore compare the effects of taxes and benefits on household incomes for different family types and earnings levels. By comparing *net* incomes at different wage levels and working hours, one can use these results to show the net impact of individual labour supply decisions on disposable income. While this in itself does not tell us how changes in tax-benefit policy will actually influence labour supply or

1. Within the European Commission services, the project is financed jointly by DGs ECFIN, EMPL and TAXUD and co-ordinated by EUROSTAT.

2. Influential studies include Daveri and Tabellini, (2000) and Nickell (1997).

3. An overview of earlier studies is provided by Pencavel (1986). See also Atkinson and Mogensen, (1993); Smith *et al.* (2003). An overview over several studies is provided by Blundell and MaCurdy (1999).

unemployment levels, it contributes to a thorough understanding of the mechanics of tax-benefit systems. This understanding of how different tax-benefit instruments interact with each other as well as with people's particular labour market situation is an essential pre-requisite for identifying tax-benefit reform priorities. Such priorities may include increasing the financial reward for work by reducing in-work taxes and/or out-of-work benefits. They may also include reducing risks of financial poverty as a result of job loss by ensuring adequacy of out-of-work benefits or extending their coverage.

9. Given the numerous elements of tax-benefit systems and the often complex interactions between them, summary indicators should be comprehensive in scope. They should take into account all relevant tax and transfer instruments in order to allow comparisons across countries with very different tax-benefit typologies. So-called *effective* tax rates satisfy this requirement by showing relative tax burdens resulting from the combined operation of taxes, social security contributions (SSCs) and benefit payments.

10. Marginal effective tax rates (METRs) show what part of a change in earnings is "taxed away" by the combined operation of taxes, SSCs and any withdrawal of earnings-related social benefits. They are thus important policy indicators for determining how financially desirable it is for an employee to increase working hours or for an unemployed person to take up employment in the first place. Their magnitude may affect structural unemployment, labour market attachment and working hours, especially for those persons at the low end of the productivity scale whose labour market opportunities may not be sufficient to induce work given the low wages they can attract. The results reported in this paper take a first step towards a more detailed look at the effects of taxes and benefits on labour market behaviour, especially of the poor. We discuss relevant concepts and limitations of these models and present results for the year 2001. Similar results for later years will become available during the course of the current project as models are updated each year.

11. Three different types of METR are evaluated in this paper (and are explained in more detail below). The first one looks at the effects of a small earnings increase and can thus be used to assess the financial consequences of increased working hours. This indicator is, for instance, relevant for analysing "low-wage trap/poverty trap" issues where low-paid workers may be locked into benefit receipt: they find their benefits strongly reduced if they attempt to supplement their income with additional earnings (see Box 1).

12. In addition to computing METRs for a small earnings increase, one may wish to assess what part of potential in-work earnings are "taxed away" for a person making a transition into work. The second type of METR can be related to the so-called "unemployment trap" where unemployed persons with low earnings potential and/or receiving relatively generous unemployment benefits face a situation where taking up employment may lead to little (or no) increase in disposable income as a result of the combined effects of benefit withdrawal and higher tax burdens on in-work earnings.

13. A third, and similar, type of METR can be computed for out-of-work individuals not eligible to receive unemployment benefits (they might instead receive minimum income benefits if applicable). The resulting marginal effective tax rate can be interpreted as describing the work incentive situation for "inactive" people of working age. However, the same METR will also be relevant for evaluating work incentives for unemployed people who are actively seeking work but who do not (or no longer) qualify for receipt of unemployment benefits.

14. The paper is divided into five sections. In section II the main methodological aspects of the calculations are presented, including a more detailed explanation of the different types of METR as well as a brief discussion of the method's main limitations. Section III then provides a detailed set of results showing "budget constraints" for *different family types* as well as the three different types of METR. Section IV highlights some of the caveats to be borne in mind when interpreting results. Finally, section V draws together a summary of the main results of the analysis and some implications for further policy reform in this area.

Box 1. “low-wage trap/poverty trap”, “unemployment trap” and “inactivity trap”⁴

The shape of the budget constraint facing low-income workers does not depend on taxation alone. Indeed, due to the presence of income-tested benefits such as in-work benefits and housing benefits as well as discontinuities in SSC schedules, low-paid workers face non-linear budget constraints with one or more “kink” points. As a result, marginal effective tax rates vary in a complex way that reflects the intricacies of tax and SSC rules as well as provisions of the transfer system. For example, even though statutory tax rates are low for levels of taxable income, METRs faced by low-income individuals can be very high because of the withdrawal of various benefits as well as certain provisions built into SSC systems.

Targeting a particular benefit or tax advantage (allowance, deduction or tax credit) toward low income is usually done by phasing out (more or less gradually) the scheme at higher levels of income. This of course reduces its budgetary costs. Yet, at the same time, it increases METRs because in the phase-out range, any additional unit of earnings causes a reduction in the benefit/tax advantage, reducing the net gain resulting from increased earnings.⁵ Depending on an individual’s labour market situation, the progressivity of tax systems combined with benefit phase-outs can affect financial work incentives in several ways.

The “*low-wage trap*”(or “*poverty trap*”) is related not to a transition into work but to the financial consequences of increasing working hours (or work effort) for those already in (low-paid) work. The “trap” refers to a situation where an increase in gross in-work earnings fails to translate into a net income increase that is felt by the individual to be a sufficient return for the additional effort (e.g., OECD, 1997). Both taxes and benefits can result in large parts of any additional gross earnings being effectively “taxed away”. The influence of taxes will be more relevant for earners of higher wages (and low-wage earners with high-wage spouses in joint tax systems). Yet, due to the withdrawal of income-tested benefits and the operation of SSC earnings thresholds above which contributions are sometimes payable on earnings as a whole, the part of an additional working hour that is taxed away at low earnings is often much higher than at average and high income levels.

The term “*unemployment trap*” is frequently used to refer to a situation where benefits paid to the unemployed and their families are high relative to net in-work earnings. While the judgement whether work “pays” is an individual decision that will depend on many factors, tax-benefit systems will play an important role. Unemployment benefit systems provide income security during unemployment and contribute to a more equitable income distribution. By providing income support to liquidity constrained persons during unemployment, they also contribute to a more efficient match between workers and jobs. Yet, at the same time, out-of-work benefits can discourage job search and put upward pressure on wage levels. In theoretical models of imperfect labour markets, unemployment benefits are deemed to increase equilibrium unemployment rate.

The “*inactivity trap*” is a situation similar to the unemployment trap except that it applies to people not receiving any unemployment benefits, including those not considered part of the labour force or “inactive” as far as paid employment is concerned. For these individuals, a situation where employment is judged not to “pay” may be brought about by minimum income or other income related benefits which would be lost upon taking up paid work.⁶ However, the tax system may also have an important deterrent effect, which can be particularly relevant for partners or spouses of working individuals: if their incomes are taxed jointly than any potential earnings of the currently “inactive” partner may be taxed at relatively high rates and may thus reduce the net gain from work. Together, benefits and taxes can effectively create a wage floor below which a transition into employment does not bring any financial gain in the short term.

Different tax-benefit instruments may have different effects on the different types of “traps”. For instance, typical employment-conditional benefit schemes, while reducing the likelihood of “unemployment” or “inactivity traps”, generally increase marginal tax rates at relatively low earnings levels as in-work benefit amounts are phased out. In terms of their potential effect on labour supply these instruments therefore trade off higher participation against lower working hours of certain groups already in work. Given such trade-offs, it is essential to monitor the financial consequences of both participation and working hours decisions.

4. The discussion in this box draws on Carone and Salomaki (2001).

5. A benefit payment is equivalent to a negative tax. As such, the income effect on work effort or working hours is negative as long as leisure is a normal good. To the extent that social transfers decrease with earnings a negative substitution effect will add to the negative income effect, leading to an unambiguous decrease of work effort or working hours.

6. While minimum income or social assistance benefits will generally be lower than unemployment benefits, they can, depending on family structure, be of a similar magnitude or even exceed unemployment benefits. In the case of earnings-related unemployment benefits, this is particularly likely for people with low previous wages (in several countries, low unemployment benefits may also be “topped up” by social

II. METHODOLOGY⁷

15. An indicator that can be used for measuring the extent to which taxes and benefits reduce the financial gain from work is the METR (Marginal effective tax rate). This measure tells us what part of any additional earnings is taxed away through the combined effects of all relevant tax-benefit instruments. Depending on the size of the “additional earnings”, the METR can be related to all three types of “trap” discussed in Box 1. For unemployed people, the additional earnings would simply be the total earnings they could attract when moving into work. The resulting METR quantifies to what extent the tax-benefit system contributes to an unemployment/inactivity trap in cases where the out-of-work person does/does not receive unemployment benefits (we will denote these measures $METR_{ut}$ and $METR_{it}$ respectively).⁸ For those in work, the “additional earnings” would be a small earnings increase and the part of that earnings change that is “taxed away” would relate to the individual’s decision of whether to increase or reduce work effort or working hours (this type of METR will be denoted $METR_{lw}$). Formally, we have

$$METR = 1 - (\Delta y_{net}) / (\Delta y_{gross}) \quad (1a)$$

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

$$\Delta y_{gross} = y_{grossB} - y_{grossA} \quad (1b)$$

and the net earnings change is

$$\Delta y_{net} = y_{netB} - y_{netA} = (y_{grossB} - t_B + b_B) - (y_{grossA} - t_A + b_A) \quad (1c)$$

where t denotes total taxes and b denotes total benefits.⁹ It is clear therefore that formally, all types of METR are the same with the only difference being the interpretation of states A and B (unemployment and employment in the case of $METR_{ut}$; inactivity and employment in the case of $METR_{it}$; and, e.g., employment with 30 and 31 hours of work per week in the case of $METR_{lw}$).

assistance payments). In addition, social assistance benefits will generally be available for longer periods than unemployment benefits and may be subject to less stringent job-search requirements.

7. A more detailed description of the methodology, the main assumptions and limitations of the tax-benefit model can be found in OECD (2002a, b). Detailed information on tax-benefit systems by country is available through www.oecd.org/els/social/workincentives.
8. $METR_{ut}$ and $METR_{it}$ can be seen as a “participation tax rate”, i.e., the amount of additional taxes plus lost benefits relative to gross earnings when moving into work. Elsewhere (e.g., OECD, 2002a), this has been referred to as an “Average Effective Tax Rate” or AETR. However, in the public finance literature an average tax rate usually refers to the ratio of tax revenues divided by the tax base without any relation to a transition between different labour market states.
9. Another measure frequently used to characterise the income consequences of labour market transitions 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 (2001 NRRs across countries are reported in section III, Table 8. For European evidence based on household micro-data, see also Immervoll and O’Donoghue (2003). If labour market state B represents “in work” and A represents “out of work”, then $NRR = y_{netA} / y_{netB}$ or, after combining with (1a) and rearranging, $NRR = 1 - \Delta y_{gross} (1 - METR_{ut}) / y_{netB}$ for a person entitled to unemployment benefits and $NRR = 1 - \Delta y_{gross} (1 - METR_{it}) / y_{netB}$ for a person not entitled to unemployment benefits. For a transition into work, the term $\Delta y_{gross} (1 - METR)$ is the part of in-work earnings that is not “taxed away” (and is thus equal to Δy_{net}).

16. We use the OECD tax/benefit model to calculate gross and net incomes for a set of different “hypothetical” family types (described in more detail below). For each of these family types, we vary gross in-work earnings for the main earner in order to compute the above METR measures for different earnings levels. To provide a conceptually consistent way of scaling results in relation to observed earnings levels across countries, we use a range of 0-200% of Average Production Worker (APW) earnings (see Table 1).¹⁰ By computing taxes and benefits for each of these earnings levels, we can draw so-called “budget constraints” showing resulting net income at each point along the (gross) earnings scale.

Table 1. APW and Statutory Minimum Wage Level, 2001

	APW			Statutory Minimum Wage		
	national currency	euro	PPP	euro	% APW	
Belgium	1,211,488	30,032	30,673	13,548	45	Belgium
Denmark	293,000	39,318	31,597	-	-	Denmark
Germany	63,338	32,384	30,901	-	-	Germany
Greece	3,734,865	10,961	13,754	6,576	60	Greece
Spain	2,614,877	15,716	18,946	5,196	33	Spain
France	140,186	21,371	21,223	13,254	62	France
Ireland	18,714	23,762	21,880	11,724	49	Ireland
Italy	40,469,979	20,901	23,746	-	-	Italy
Luxembourg	1,222,407	30,303	27,623	15,294	50	Luxembourg
Netherlands	64,953	29,474	29,386	14,004	48	Netherlands
Austria	322,005	23,401	23,124	-	-	Austria
Portugal	1,600,047	7,981	10,734	4,680	59	Portugal
Finland	160,802	27,045	24,972	-	-	Finland
Sweden	231,134	24,974	21,561	-	-	Sweden
UK	18,950	30,437	26,975	13,608	45	UK

Sources: OECD for APWs; Eurostat for minimum wages and purchasing power parities (PPPs are provisional)

17. When computing budget constraints, a decision needs to be made about what is assumed to drive the change in earnings. First, one can assume that hourly wages are constant while working hours change. This is necessary for calculating METRs for part-time workers. It is also more appropriate for very low wages since, as a result of (statutory or collectively bargained) minimum wages, full-time workers will normally not have earnings below a certain minimum. From Table 1, we can see that, in the majority of Member States with a statutory minimum wage, the minimum wage level is in the range of 50-60% of APW, with the highest levels found for France and Greece (60 and 62% APW) and the lowest for Spain (at 33% APW). A second possibility is to assume that hourly wages are changing, while working hours remain constant. This is for instance necessary for evaluating net incomes and METRs of low-wage full-time workers. We provide results under both assumptions.¹¹

II. 1 Model scope, income concepts and unit of analysis

18. The budget constraint shows current net incomes defined as current gross earnings plus total cash benefits minus total taxes. Total taxes include:

10. Methodological details on the computation of Average Production Worker earnings amounts are provided in OECD (2002b).
11. For most countries, the two approaches (fixed hours and fixed hourly wages) yield the exact same result. But for some countries, notably, Denmark, Ireland, Luxembourg, the Netherlands and the United Kingdom, results differ due to tax-benefit rules such as the entitlement to partial unemployment benefits for part-time workers returning to work, or minimum/maximum working hours requirements built into tax concessions or benefits (such as employment-conditional benefits).

- National and local income tax;¹² and
- Own SSC paid by employees and benefit recipients excluding voluntary contributions made to either private or public insurance institutions,

while cash benefits include:

- family benefits (including employment-conditional “in-work” benefits where they are family related);
- minimum income (or social assistance) benefits generally excluding any strictly housing-related parts;
- housing benefits generally including any strictly housing-related parts of minimum income programs; and
- unemployment benefits.

19. Disability benefits, private-, occupational- or state old-age pension payments as well as any income from capital are not considered. Benefit incomes are often taxed or subject to SSC and this is taken into account when computing net incomes for benefit recipients.¹³

20. We are measuring current incomes 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. Yet, this is beyond the scope of our static modelling framework which focuses on current incomes. For low-income groups who frequently face liquidity constraints, current incomes will, in any case, often be the more immediate concern.

21. Social security contributions paid by employers are substantial in many countries. In addition, the extents to which pensions, health services or unemployment benefits are financed by contributions or taxes differ enormously across countries (see OECD, 2002b). It is therefore useful to consider how employer SSC might affect our results. A first consideration is whether the insurance value or any future benefits bought by SSC should be taken into account in the calculations. As explained above, while taking into account future income streams may be desirable, our static framework considers current incomes only. A second, and separate, issue concerns the incidence of SSC (see OECD, 1990, chapter 6). To the extent to which employer SSC reduce employees’ net wages, they might usefully be considered a tax on employees. Similarly, any part of employee SSC that are incident on the employer may not be considered as reducing employees’ take-home pay. However, any “forward” or “backward” shifting of SSC will take place via adjustments to contractual wages. If APW 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 in our calculations. Given our 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 SSC while not deducting any parts of employer SSC that may be incident on employees since these will already be reflected in lower APW values.^{14,15}

12. Only standard tax relief are included when calculating tax payments. These are tax concessions unrelated to actual expenditures incurred by the taxpayer and are automatically available to taxpayers who satisfy relevant eligibility rules. Typical standard reliefs include the basic reliefs available to all taxpayers, wage earners or benefit recipients, irrespective of family status; reliefs available to taxpayers depending on their marital status; reliefs granted to families with children; and the relief for work-related expenses. See OECD (2002b) for further details.

13. A detailed descriptions of countries’ tax-benefit rules can be found in OECD (2002a, b).

14. For instance, to the extent that employer SSCs are incident on employees through lower wages, lower employer SSC will, other things being equal, result in higher contractual wages. What does this mean in terms of financial work incentives as measured using our net income concept? If employer SSC are raised

22. A final definitional issue to be considered when computing net incomes and measures such as METRs and NRRs is who to compute them for. In multi-person households, income situations will depend on the earnings, taxes and benefits of a number of people. For instance, one spouse's earnings may reduce the other spouse's unemployment benefits. Similarly, one household member's income tax liability will usually depend on other household member's characteristics even for tax systems that are not explicitly "joint". In order to capture all relevant interactions, we compute all income measures at the household level. It is important to note that, for the purpose of evaluating financial work incentives, this implies the assumption that work decisions are taken at the *household* level.

II. 2 Family types

23. The stylised family types considered throughout the analysis are:

1. Single adults without children (earnings of adult 0-200% APW).
2. Single-adult parents, with two children (earnings of adult 0-200% APW).
3. One-earner adult couples (earnings of first spouse 0-200% APW; 2nd spouse inactive).
4. As in 3, but with two children.
5. Two-earner adult couple (earnings of first spouse fixed at 67% APW; 2nd spouse earning 0-200% APW).
6. As in 5 but with two children.

24. Adult employees are assumed to have an uninterrupted employment record of 22 years to ensure people qualify for unemployment benefits. Given this assumption, the assumed age for all adults is 40 years. In the case of families with children, the assumed ages are 4 and 6 meaning that their parents will not be entitled to maternity benefits. Similarly, child-care benefits are not considered in the present analysis (but will be included at a later stage of the current project). All accommodation is assumed to be rented with rent constant at 20% of APW. Since the focus of this analysis is on labour market transitions we assume that people whose earnings are being varied have just made a transition from unemployment into employment. As a result, people shown with limited working hours will often still be entitled to unemployment benefits since, in many countries, a transition from unemployment into part-time work is encouraged through the possibility of combining income from part-time work with part-time unemployment benefits.

25. The combination of these six household typologies with the wide range of earnings and the three types of labour market status (employed, unemployed, inactive) implies that tax and benefit rules applying

from zero to X and a fraction of $0 \leq s \leq 1$ of X is shifted to employees, then average wages w will 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 and t is the individual's average tax rate while in work. This is of course the same NRR we would obtain if, instead of raising X through employer SSC, employees would pay contributions of X in the case where a fraction of $1-s$ would be shifted to employers. It is clear, therefore, that in the framework of our modelling exercise, the above net income concept results in conceptually consistent NRR (and, of course, METR) measures regardless of whether SSC are paid by employees or employers.

15. In order to provide a more comprehensive view of the impact of the tax system, results of additional computations taking also into account the impact of employer SSC are provided in annex B and compared to the results in the main text. When employer SSC are considered, METRs need to be interpreted as marginal effective tax rates on *labour costs*. To compute these, employer SSC will of course enter both the numerator and the denominator of equation (1a). Given that employer SSC vary substantially between countries (see Table B1 in annex B: they are relatively high in Belgium, Greece, Spain, France, Italy, Sweden, but very small in Denmark), this can of course change any METR ranking of countries. Yet, in some cases the patterns are not very different, especially at low wage levels (see Table B2-B5 in annex B). In any case, and as argued above, for considering the impact of labour market changes on people's current net income, the METR definition needs to exclude employer SSC.

to a considerable part of countries' actual populations are covered in the calculations. Table 2 provides a summary picture of the relevance of the chosen household types in EU Member States and Candidate Countries.

Table 2 - Distribution of households (%) by type of households*

(1999)

	<i>Total</i>	<i>Single person</i>	<i>Single parent with dependent children</i>	<i>Two adults</i>	<i>Two adults with dependent children</i>	<i>Three or more adults</i>	<i>Three or more adults with dependent children</i>
BE	100	29.7	6.7	26.4	33.3	2.2	1.8
DK	100	37.3	5.2	31.3	21.3	2.9	2.2
DE	100	35.4	3.9	31.4	22.1	5.2	2.1
GR	100	16.0	2.1	28.8	28.1	16.7	8.5
ES	100	10.1	2.0	21.9	32.4	19.0	14.7
FR	:	:	:	:	:	:	:
IE	100	20.8	5.2	20.7	31.9	10.7	10.7
IT	100	22.0	2.4	27.1	29.8	12.3	6.3
LU	100	24.8	3.1	25.4	31.2	9.3	6.2
NL	100	33.7	4.8	31.2	26.1	2.8	1.4
AT	100	30.2	3.7	27.8	22.0	9.9	6.5
PT	:	:	:	:	:	:	:
FI	100	38.3	4.8	29.6	23.6	2.6	1.2
SE	100	38.2	5.7	28.1	24.4	2.0	1.5
UK	100	31.4	6.5	30.3	21.0	7.3	3.5
CY	100	12.1	1.6	24.1	41.4	10.4	10.5
CZ	100	24.5	4.2	30.2	35.6	2.8	2.7
HU	100	24.0	8.0	22.0	26.0	5.0	15.0
PL	100	14.0	6.0	22.0	36.0	9.0	13.0
SK	100	16.0	5.0	19.0	52.0	3.0	5.0

Source: Eurostat, Household budget surveys, 1999
*(Including retired persons)

26. While no set of hypothetical households can fully capture the heterogeneity of existing populations, the purpose here is to choose households that allow us to assess the main features of tax-benefit systems. Yet, given the numerous dimensions that characterise real households (and will influence tax-benefit calculations), it is important not to try to extrapolate results to household types not covered here (or to the population as a whole, which would only be possible using a tax-benefit model in conjunction with representative household micro-data).¹⁶

16. For a microdata-based method to assess effective tax rates in the EU, based on EUROMOD, an EU-wide tax benefit microsimulation model, see Immervoll (2002).

III. RESULTS

27. Before presenting model results for each country, it is useful to consider the effect of each type of tax-benefit instrument on the METR. The change in net income from equation (1a) can be expressed as the sum of the change in gross earnings plus the contributions of each tax-benefit instrument to the total METR so that:

$$METR = (\Delta IT + \Delta SSC - \Delta HB - \Delta FB - \Delta SA) / \Delta y_{gross} \quad (2a)$$

where *IT*, *SSC*, *HB*, *FB* and *SA* denote income tax, own social security contributions, housing benefits, family benefits and minimum income/social assistance benefits. The impact of each component on the METR can be expressed as follows (taking income tax as an example):

$$\Delta IT / \Delta y_{gross} = (\Delta IT / IT) (IT / y_{gross}) (y_{gross} / \Delta y_{gross}) \quad (2b)$$

28. The contribution to the METR of a particular tax-benefit instrument is determined by its percentage change following a change in gross income as well as its size relative to gross income. In the case of a tax the second term on the right-hand side is the average tax rate while the first and third terms combined is the elasticity of the tax liability with respect to the tax base, which is one of the measures of tax progressivity commonly used in the literature (Jacobsson, 1976).

III.1 Marginal effective tax rate relating to the “low-wage trap”

29. **Definition:** The marginal effective tax rate for an employed person ($METR_{lw}$) can be used as an indicator of the size of the so-called low-wage trap (or poverty trap). It is aimed to measure the financial incentives to improve a household’s income situation by increasing earnings, and is defined as the rate at which taxes are increased and benefits reduced as a person increases his or her earnings by a small amount.

30. To identify the possible earnings range over which different tax-benefit components can have an impact on METRs, we first consider the earnings levels at which relevant transfers are completely phased out (Table 3). The general impression is that in almost all countries, METRs on individual and household incomes in excess of 67% APW are entirely determined by income tax and SSC while benefit withdrawals tend to only play a role below 67% APW. There are few exceptions to this general pattern. For single earner couples with children, social assistance (upper panel of Table 3) is available up to an earnings level of 75-80% of APW in Denmark, France, Portugal and Sweden. Housing benefit entitlements (lower panel of Table 3) can extend up to earnings levels of almost 110% APW for some Swedish household types and to around 80-90% APW for families with children in Denmark, Germany, France, the Netherlands, Finland and the United Kingdom. In Belgium, Greece, Spain, Ireland, Italy and Portugal, cash housing benefits do not exist at all, at least at national level.

31. In most countries family benefits are universal, so that this component usually does not have any impact on METRs. A few exceptions are worth noting, however. In Italy, child allowances are related to income and hours of work so that part-time workers receive less than full-time workers and high-income full-time workers receive less than low-income full-time workers. A second notable feature is that family benefits can also be received by one-earner couples *without* children. Family-related in-work benefits which are phased out as incomes increase are of particular relevance for the determination of METRs. In 2001, such in-work benefits existed in the UK (Working Families’ Tax Credit, WFTC) and Ireland (Family

Income Supplement, FIS).¹⁷ In both cases the withdrawal of in-work benefits is one of the main driving forces of $METR_{hw}$. In the case of the WFTC, benefit amounts were reduced by 55 pence for each GBP1 extra income, giving rise to relatively high $METR_{hw}$. For recipients of these benefits, the phase-out range ends at around 100% APW so that $METR_{hw}$ of higher earnings levels are no longer affected by benefit withdrawals.

Table 3 Level of household's earnings (as % of APW) at which transfers are completely phased out
Year: 2001

Social Assistance transfers						
SA	Single	Single2C	1earnerC	1earnerC2C	2earnerC67	2earnerC2C67
BE	27	34	34	34		
DK	46	54	80	81	83	84
DE	51	59	56	58		
GR						
ES	21	31	27	36		
FR	47	66	68	79		79
IE	43	17	57	50		
IT						
LU	43	51	64	72		
NL	37	41	48	46		
AT	43	50	54	64		
PT	45	89	89	133	81	109
FI	34	19	47	65		
SE	49	25	66	72		
UK	16	38	25	40		
Housing Benefits transfers						
HB	Single	Single2C	1earnerC	1earnerC2C	2earnerC67	2earnerC2C67
BE						
DK	49	78	80	93	83	93
DE	51	63	56	81		84
GR						
ES						
FR	48	90	58	90		91
IE						
IT						
LU	43	51	64	72		
NL	54	72	72	72	72	72
AT	43	50	54	64		
PT						
FI	56	86	74	91	74	91
SE	49	107	66	82		107
UK	56	96	68	85	69	83

Notes: Single2c= Lone parents with two children
1earnerc= one-earner couple
1earnerc2c= one-earner couple, with two children
2earnerc67= two-earner couple, second spouse earns 67% APW,
2earnerc67c2= two-earner couple, two children, second spouse earns 67% APW.

32. Looking at the earnings ranges over which benefits have an influence on $METR_{hw}$ we can conclude that they are mostly relevant for lower earnings levels, often close to the earnings of a full-time worker earning the statutory minimum wage where it exists. In the discussion that follows, we will therefore mainly focus on households at the lower end of the income scale. Indeed, for a two-earner couple where one spouse earns at least 67% APW (one of the family types for which results are shown below), the financial effects of the second spouse's working hours decision will, in most countries, be determined exclusively by taxes and SSC. Most income-related benefits are already phased out at 67% APW and will therefore not affect the second spouse's $METR_{hw}$. Of course, the decision on whether to participate at all

17. The UK Working Families Tax Credit (WFTC, recently replaced by Child Credit and Employment Credit) is an in-work benefit for parents working at least 16 hours per week. In Ireland the Family Income Supplement (FIS) pays 60% of the difference between the net family income and an earning limit (dependent on family size). A claimant must be working at least 19 hours per week (two-earner couples can cumulate their joint working hours for this purpose). Several other EU countries have introduced employment-conditional benefits after 2001.

will be affected by out-of-work benefits (see the discussion of $METR_{ut}$ and $METR_{it}$ in sections III.2 and III.3 below). It should also be noted that, for these family types, child-care costs (not taken into account here) may be an important influence on a household's budget and, hence, the second earner's choice of working hours (see the discussion in section IV).

Table 4 - Low-wage trap indicator (2001)
Marginal effective tax rate at different wage levels, as wage increases by 1% of the APW wage level

% of APW	Single					Single parent, 2 children					1 earner couple				
	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%
BE	-20	72	54	55	56	-20	72	54	55	56	-16	62	45	51	56
DK	109	45	56	50	64	105	105	67	50	64	104	116	110	45	64
DE	100	70	51	58	59	100	100	48	55	52	100	100	39	48	45
GR	16	16	16	29	41	16	16	16	19	41	16	16	16	29	41
ES	6	23	33	29	33	6	6	6	29	29	6	6	26	29	33
FR	89	18	41	34	37	84	84	46	21	40	91	91	30	28	30
IE	100	20	24	26	48	0	60	62	26	48	100	100	4	26	26
IT	10	26	32	39	39	10	10	120	39	39	10	26	32	39	39
LU	109	28	31	42	53	110	120	14	14	49	110	110	14	29	36
NL	100	120	45	45	42	100	89	41	45	42	100	93	45	45	42
AT	100	18	37	43	50	100	18	37	43	50	100	100	37	43	50
PT	55	11	23	25	35	55	55	55	11	35	55	55	55	23	25
FI	54	83	41	47	52	46	74	88	47	52	100	83	95	47	52
SE	100	37	37	35	52	25	45	57	55	52	100	100	37	35	52
UK	73	76	32	32	32	88	89	89	69	32	73	76	70	32	32
CZ	46	46	26	30	30	100	17	41	36	30	100	26	41	28	30
HU	21	39	40	40	51	13	12	34	40	51	21	39	40	40	51
PL	25	34	34	34	34	100	34	34	34	34	100	25	34	34	34
SK	38	46	27	23	30	100	100	46	23	30	100	100	100	23	30
NO	72	36	36	36	49	63	63	63	36	49	72	36	36	36	49
SZ	100	23	23	29	33	100	100	20	27	30	100	100	22	25	28
US	43	29	29	29	42	27	48	46	51	29	35	46	29	29	29
JP	93	17	17	22	28	93	93	17	19	22	93	93	17	19	22

% of APW	1 earner couple with 2 children					2 earners couple*					2 earners couple with 2 children*				
	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%
BE	-20	62	45	51	56	-20	72	56	56	56	-20	72	56	56	56
DK	100	100	116	45	64	45	45	56	50	64	45	45	56	50	64
DE	100	100	60	46	45	55	54	51	54	45	50	52	51	54	42
GR	16	16	16	19	41	16	16	16	29	41	16	16	16	19	41
ES	106	6	6	23	29	6	23	33	29	33	6	6	26	29	33
FR	84	84	88	21	25	25	25	35	34	30	18	18	29	28	30
IE	100	60	62	26	26	20	20	24	26	48	20	20	24	26	48
IT	10	10	32	120	39	51	26	32	39	39	120	26	32	39	39
LU	110	110	110	14	36	14	27	31	34	42	14	14	14	34	42
NL	100	93	45	45	42	25	45	45	45	42	25	45	45	45	42
AT	100	100	37	43	50	18	18	37	43	50	18	18	37	43	50
PT	55	56	55	67	25	15	15	23	23	25	82	11	11	23	25
FI	100	100	85	47	52	27	37	41	47	52	27	37	41	47	52
SE	100	100	100	35	52	25	37	37	35	52	45	37	37	35	52
UK	88	89	89	69	32	22	32	32	32	32	10	32	32	32	32
CZ	100	100	26	38	30	26	26	26	30	30	27	31	26	26	30
HU	13	12	34	40	51	20	39	40	40	50	20	39	40	40	50
PL	100	100	34	34	34	34	34	34	34	34	34	34	34	34	34
SK	100	100	100	23	30	13	23	23	23	30	13	23	23	23	30
NO	100	77	36	36	49	36	36	36	36	49	36	36	36	36	49
SZ	100	100	90	24	28	24	27	27	33	36	22	25	27	31	35
US	80	48	64	51	29	29	29	29	29	29	4	24	29	29	29
JP	93	93	93	19	22	14	17	17	22	22	10	13	17	19	22

* The wage level of the first earner is fixed at 67% of the APW, while the wage level of the second earner is indicated in each column

Source: Joint European Commission-OECD project, using OECD Tax -Benefit models.

33. Table 4 shows a summary of $METR_{lw}$ results for selected earnings levels as a first step. The “additional earnings” (Δy_{gross}) used for computing $METR_{lw}$ is 1% of APW. For people earning less than 100% APW, we assume part-time work (at APW hourly wage level). Comparing results across countries one can see a substantial divergence of METRs at similar relative earnings levels. Yet, it is important to remember that, given the often complex shapes of budget constraints, single-point estimates of METRs, for particular earnings levels are not very informative and may give a misleading picture of the overall situation if presented in isolation (Immervoll *et al.*, 2001).

III.1.1 Budget constraints

34. In a second step we therefore derive a fuller representation by plotting both net incomes and $METR_{lw}$ over the 0-200% APW range of gross earnings income for all six family types discussed above (Figures 1-6). In order to show the effect of minimum income/social assistance benefits on $METR_{lw}$, the underlying assumption here is that the person whose earnings are being varied is *not* entitled to unemployment benefits while out of work.

35. In these charts $METR_{lw}$ (thick solid black line, plotted against the right-hand axis) is depicted along with net incomes (for the household as a whole: thick upwards sloping kinked line) and gross earnings (thin upwards sloping straight line).¹⁸ The net income plot represents the “budget constraint”: it shows the opportunity set in terms of feasible combinations of net income and gross earnings (with earnings being determined by hourly wages and working hours). The vertical distance between gross and net income is the amount of net taxes. Net taxes are positive if net income is below gross income and negative if it is above. Dividing net taxes by gross income gives the effective tax burden. The point where the two lines cross represents situations where the effective tax burden is zero. We call this the *break-even point*. All persons with net incomes above gross incomes receive a net transfer. For a given country and family type, higher break-even points mean larger numbers of net benefit recipients.¹⁹

36. The slope of the net income plot represents the marginal effective tax rate $METR_{lw}$ which equals zero where the slope of the net income line is parallel to the gross income line since in this case, any change in gross income results in the same change in net income. The flatter the net income plot, the larger is the part of any “additional earnings” that is “taxed away”. Where the net income line is horizontal, an increase in gross income is taxed away entirely ($METR_{lw} = 100\%$). Of course, $METR_{lw}$ can exceed 100% in which case the net income line will be downwards sloping (e.g., in Hungary where the entire amount of minimum income benefit is withdrawn once earnings of a single person exceed about 16% APW). Negative $METR_{lw}$ occur in cases where the increase in net income exceeds the amount of “additional earnings”. This can, for instance, be an (intended) result of in-work benefits where workers receive a relatively large benefit when they increase earnings beyond a certain threshold (UK families with children). Another reason may be that certain types of SSC are no longer compulsory once earnings exceed a certain level (such as in the Netherlands where high-wage earners are supposed to fund their own private health insurance).²⁰

37. Looking at the $METR_{lw}$ plot, it is apparent that there are numerous spikes and steps reflecting kinks in the budget constraint. It is important to note that a large spike in itself will not necessarily translate into a large work (dis-)incentive. The budget constraint (or what we have termed the “opportunity set” above) is based on the assumption that people can “choose” any earnings levels (or at least any of the 200 points used to draw each of the graphs in figures 1-6). Clearly, this is unrealistic if we interpret the budget constraint in terms of changing working hours. The “additional earnings” that a typical worker would consider when deciding whether additional work “pays” may frequently be larger than the 1% APW interval we have chosen for computing $METR_{lw}$. To understand the mechanics of existing tax-benefit systems and to capture all interactions between different tax-benefit instruments that might potentially influence people’s choices, it is, in the first instance, nevertheless desirable to look at the effects of small changes in earnings (such as 1% of APW) on net incomes. Following equation (1), alternative $METR_{lw}$ measures can easily be computed for other earnings changes.²¹

38. Spikes are most obvious at low earnings levels where several different tax and benefit instruments interact. At very low gross earnings levels, marginal rates are usually close to 100% reflecting the withdrawal of minimum income/social assistance benefits. Where different benefits are withdrawn independently (e.g., social assistance and housing benefits in Luxembourg), $METR_{lw}$ can remain above 100% over an extended earnings range resulting in *decreasing* net incomes as working hours increase.

18. For presentational convenience, we have limited the shown METR range to [-120%; +120%].

19. Note that the distribution of gross incomes differs across countries. As a result, the break-even point is not sufficient to make inferences about the number of benefit recipients across countries.

20. Contributions to private insurance schemes are not taken into account in our model calculations except if they are compulsory.

21. Doing this for multiples of the 1% APW interval, as considered here, is facilitated by the numerical breakdowns of budget constraints (table A5 in annex A). This table is available in electronic spreadsheet format (http://europa.eu.int/comm/economy_finance/publications/economicpapers_en.htm).

39. At the other extreme, $METR_{lw}$ at low earnings levels are much lower (and driven by the marginal income tax and SSC rates) in countries where extensive minimum income safety nets do not exist (Greece, Italy). Of course this comes at the expense of high risks of poverty for those with low or zero earnings.²² Indeed, an essential use of the “budget constraint” graphs is the evaluation of the adequacy of minimum income/social assistance schemes and their role in reducing poverty risks.²³ The minimum income level guaranteed by such schemes is represented by the point at which the net income line intersects the left-hand axis.

40. At the upper end of the earnings spectrum, changes in $METR_{lw}$ usually result from a combination of increasing marginal income tax rates and SSC provisions which frequently cause drops of $METR_{lw}$ due to upper contribution thresholds above which marginal SSC rates drop to zero (e.g., Austria, Luxembourg). A notable feature of the German income tax is that statutory marginal rates rise continuously rather than in steps.

III.1.2 Decomposition by tax-benefit instrument

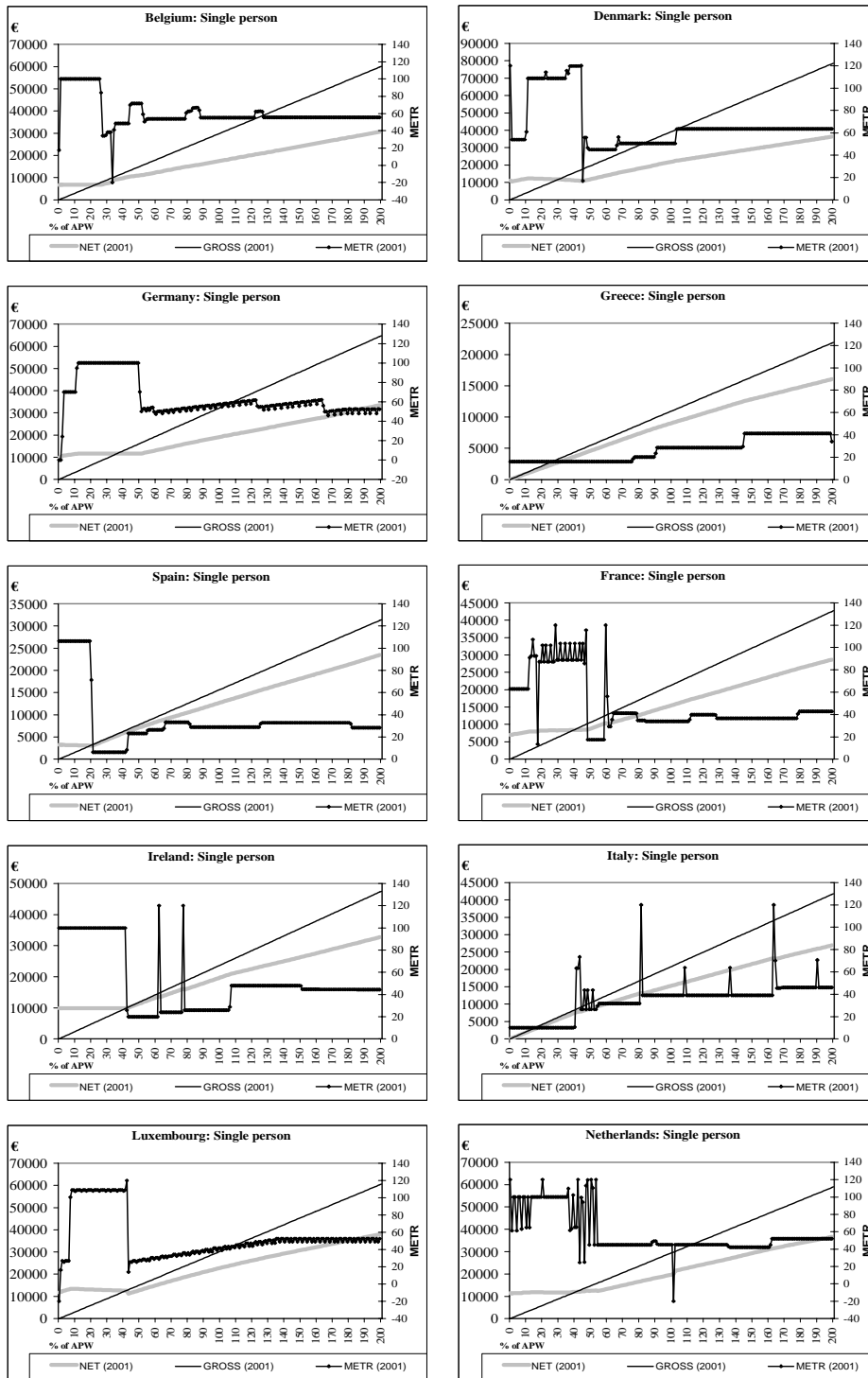
41. The influence of each tax-benefit instrument can be seen more clearly from Table A1 in annex A where we show a decomposition of $METR_{lw}$ results in terms of individual tax-benefit components. This decomposition (see equation 2a) identifies the relative contribution of different tax and benefit instruments to high $METR_{lw}$ which is essential when thinking about the influence of individual policy measures.

42. Without commenting on the results in great detail, it is instructive to look at the influence of the Family Benefit component in Ireland and the United Kingdom as this provides an example of the adverse impact on $METR_{lw}$ of benefit instruments aimed at increasing labour force participation. While Irish $METR_{lw}$ are close to zero for families without children up to 60-70% of APW, they are far higher (at about 60%) over the same income range for households with children, due to the functioning of the aforementioned Family Income Supplement (counted in the Family Benefit category in Table A1). In the United Kingdom, we find a similar picture due to the gradual reduction of the Working Family Tax Credit. Yet, the marginal deduction rate is lower than in Ireland. At the same time, these programmes increase the incomes of low-wage employees, and thus provide both income support for the “working poor” and an incentive to seek employment. These latter effects will be reflected in the $METR_{it}$ and $METR_{it}$ measures discussed in sections III.2 and III.3 below.

22. Several countries are, however, successful at combining means-tested minimum income safety nets with retaining a degree of work incentives for benefit recipients by exempting a part of in-work earnings from the means-test.

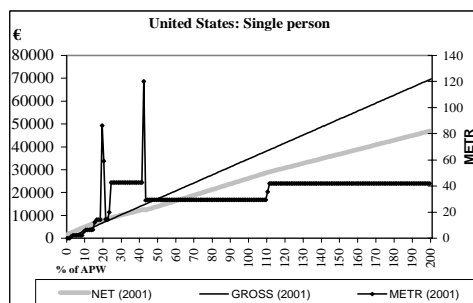
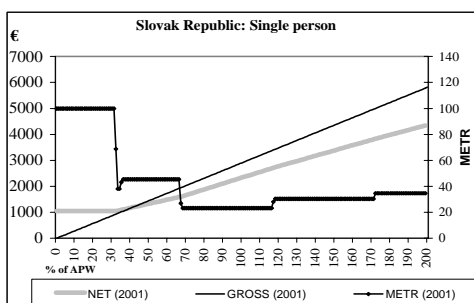
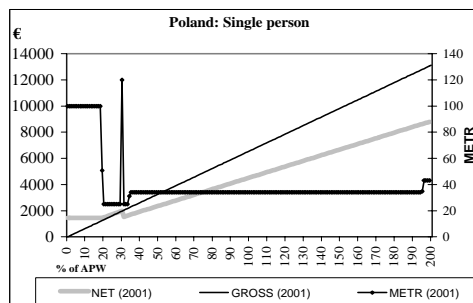
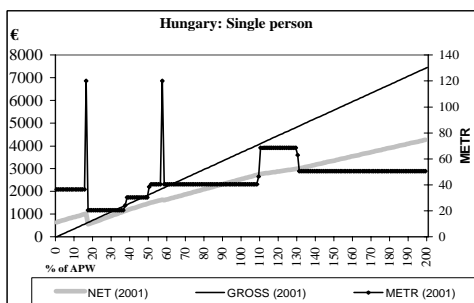
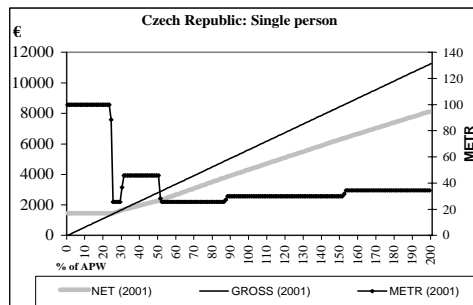
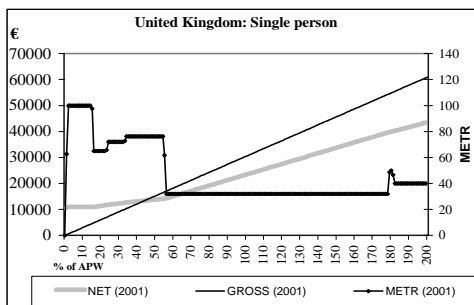
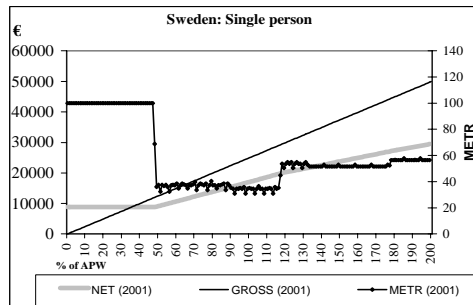
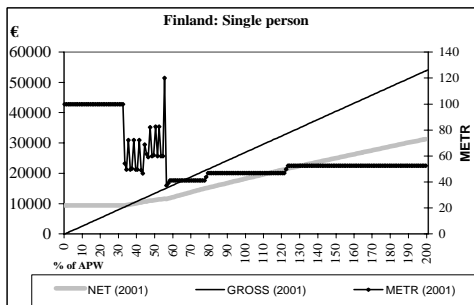
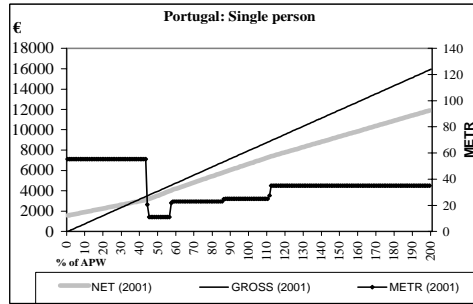
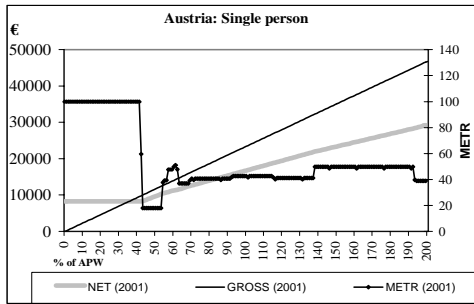
23. Immervoll *et al.* (2001) use this method to analyse and compare the effects of the tax-benefit system on low-income households in the Benelux countries.

Figure 1 – “Low-wage trap” indicator: METR_{lw} for a single person, 2001



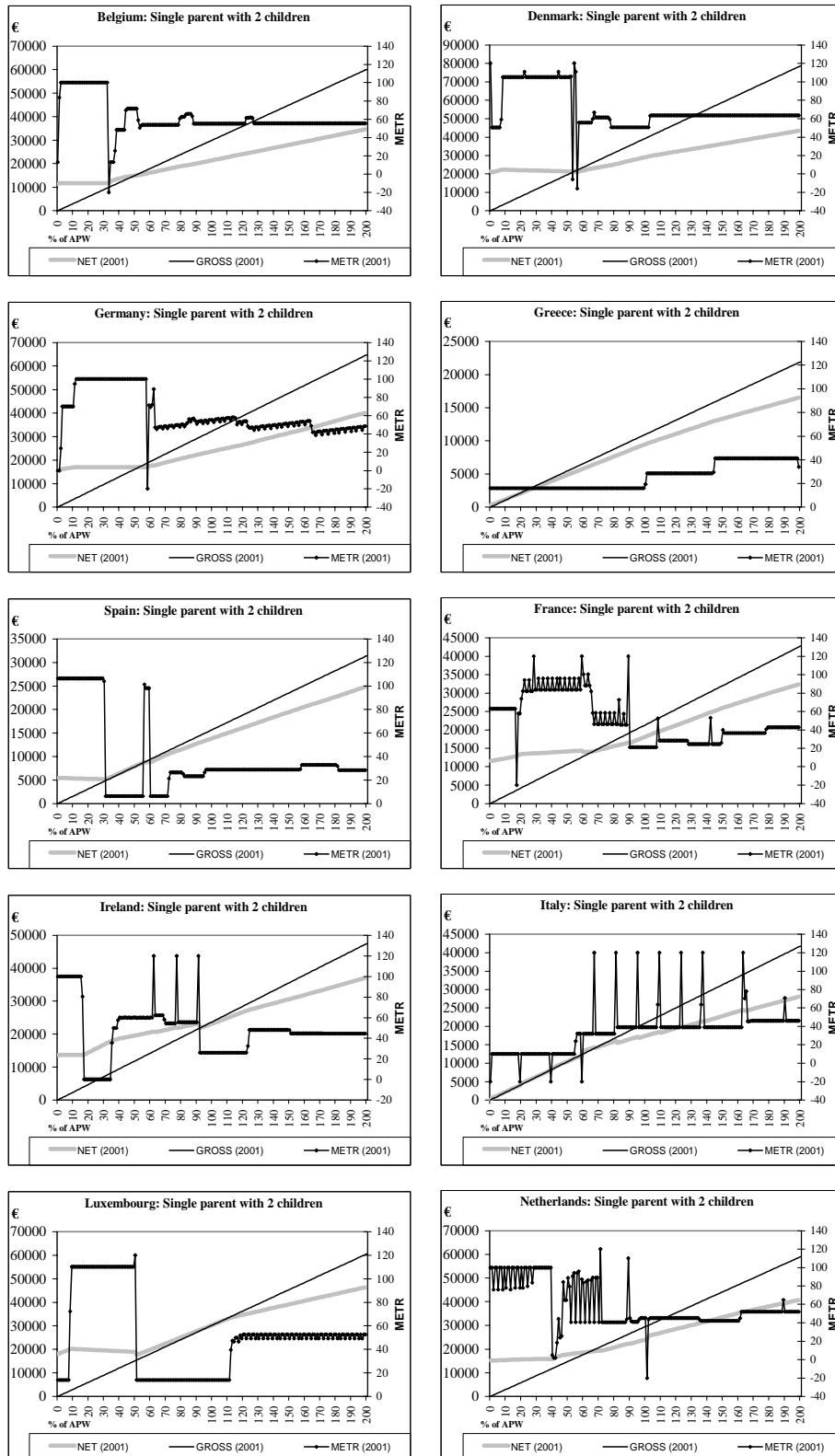
Source: Joint EC-OECD project, using OECD Tax-Benefit models.

Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).



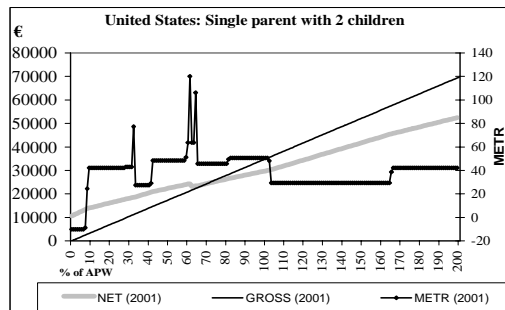
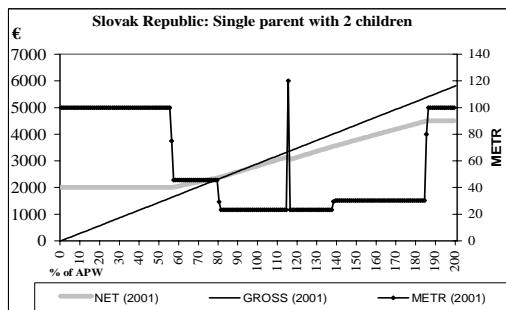
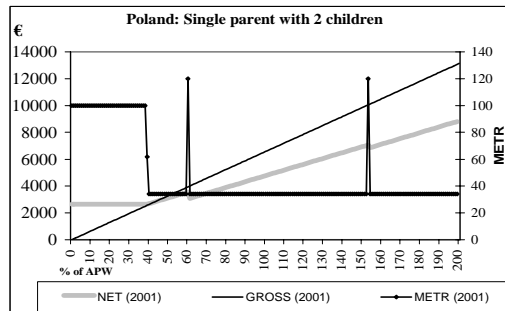
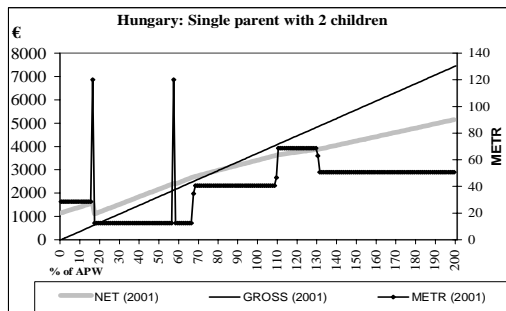
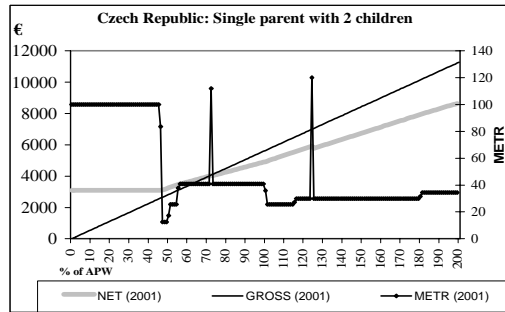
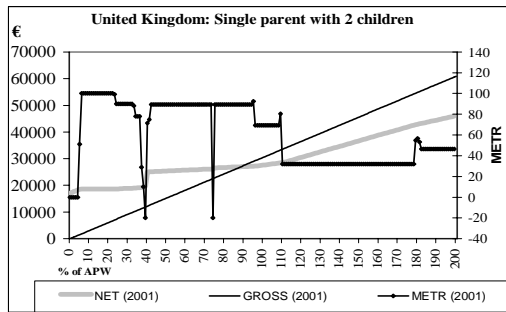
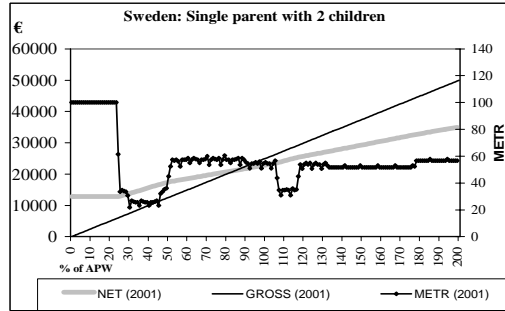
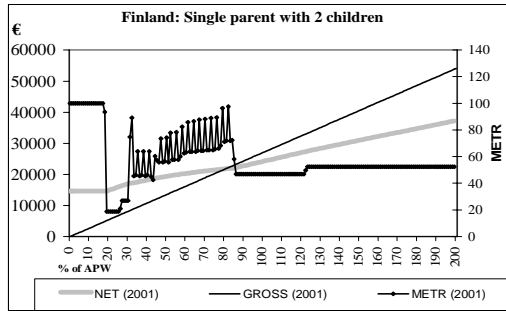
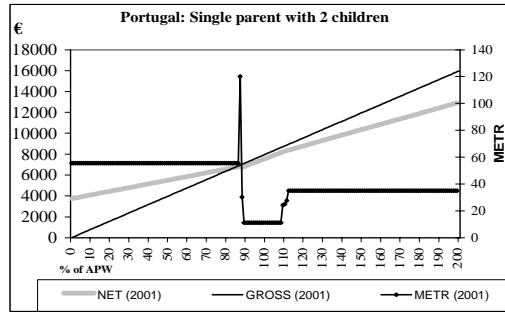
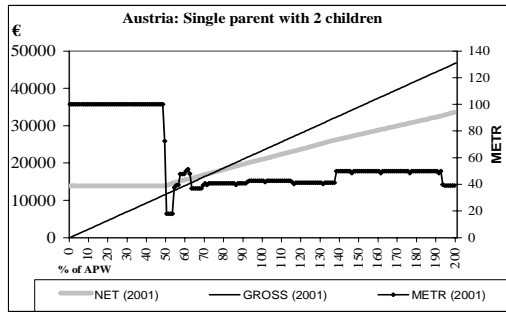
Source: Joint EC-OECD project, using OECD Tax-Benefit models.
Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).

Figure 2 - METR_{lw} for Single parent with 2 children, 2001



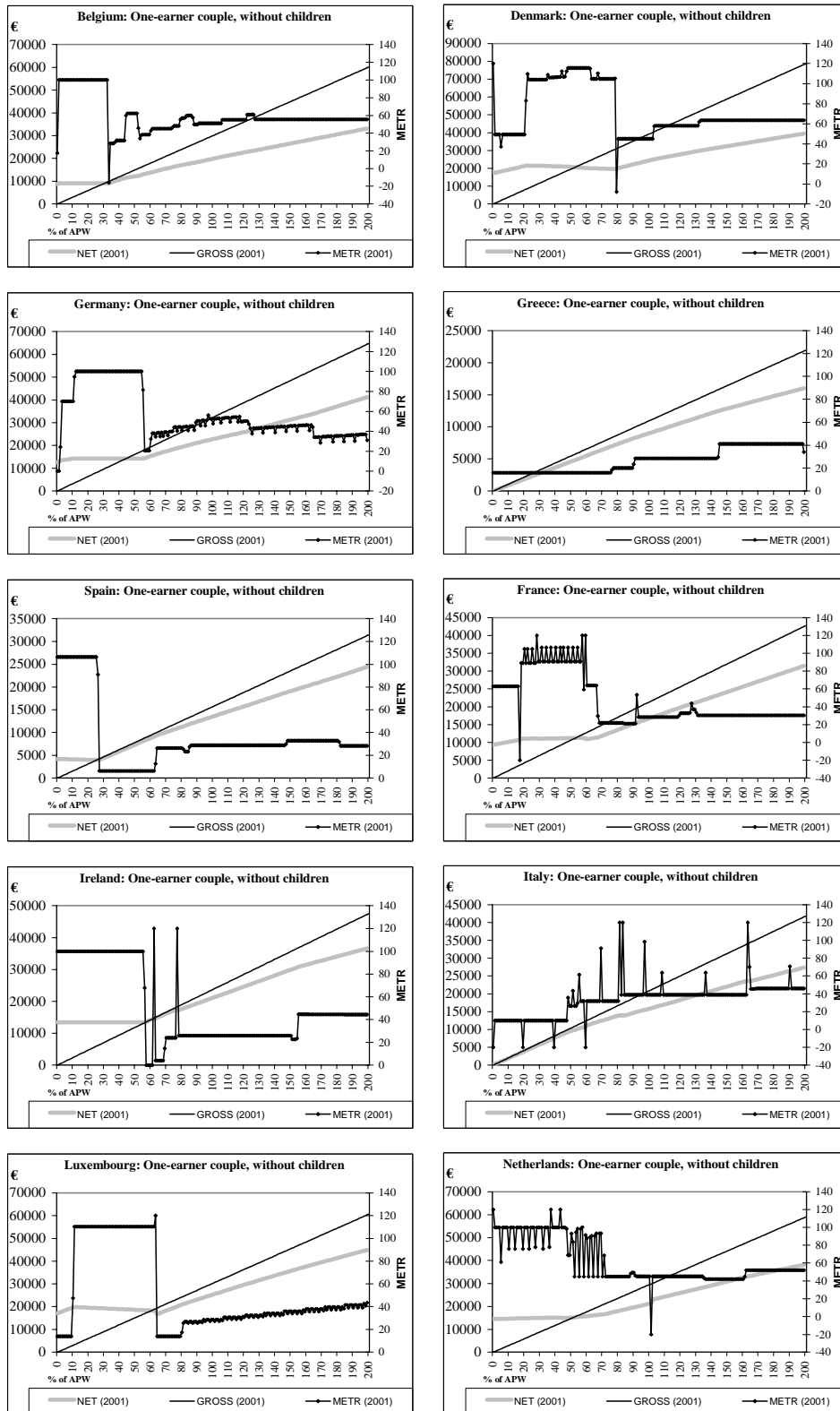
Source: Joint EC-OECD project, using OECD Tax-Benefit models.

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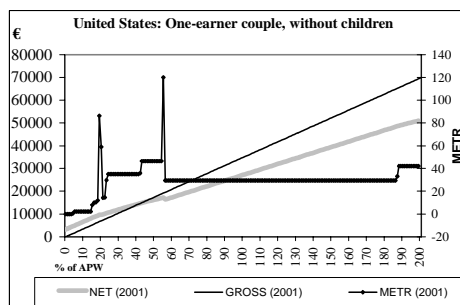
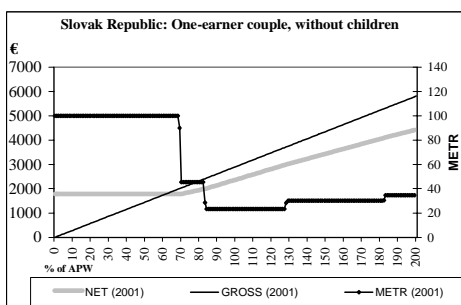
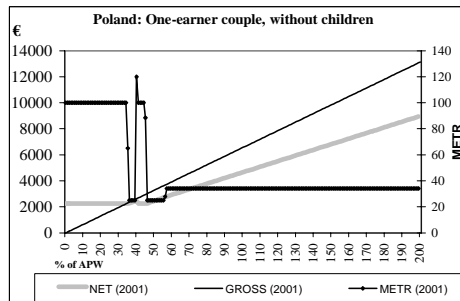
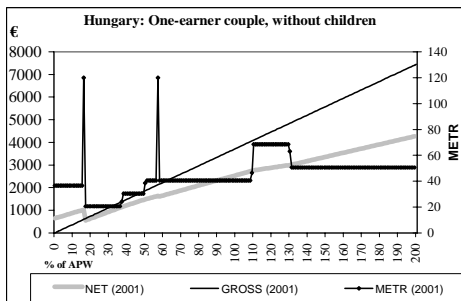
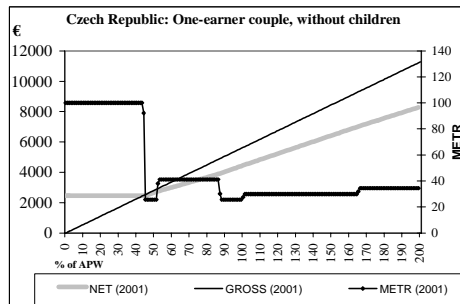
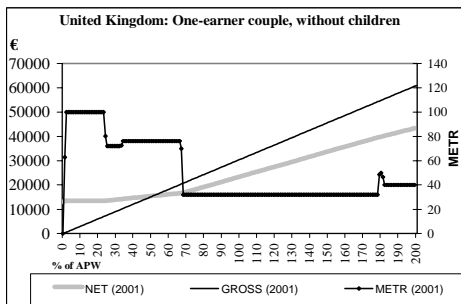
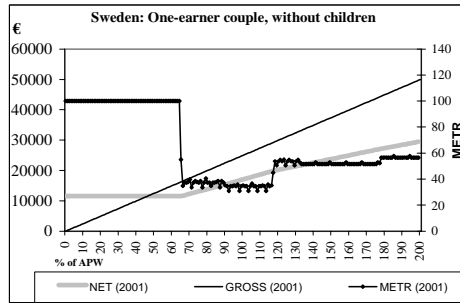
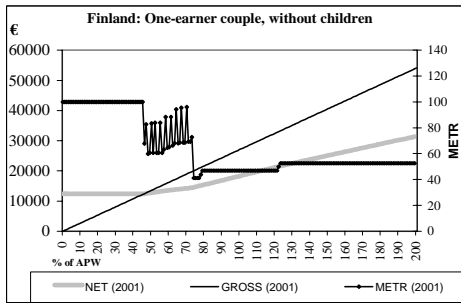
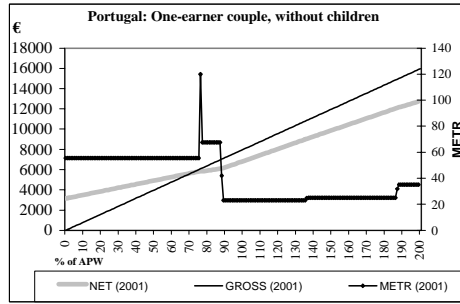
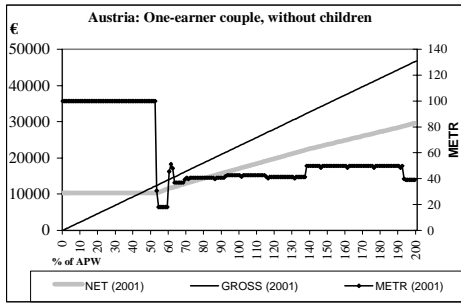


Source: Joint EC-OECD project, using OECD Tax-Benefit models.
Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).

Figure 3 – METR_{1w} for one-earner couple without children, 2001

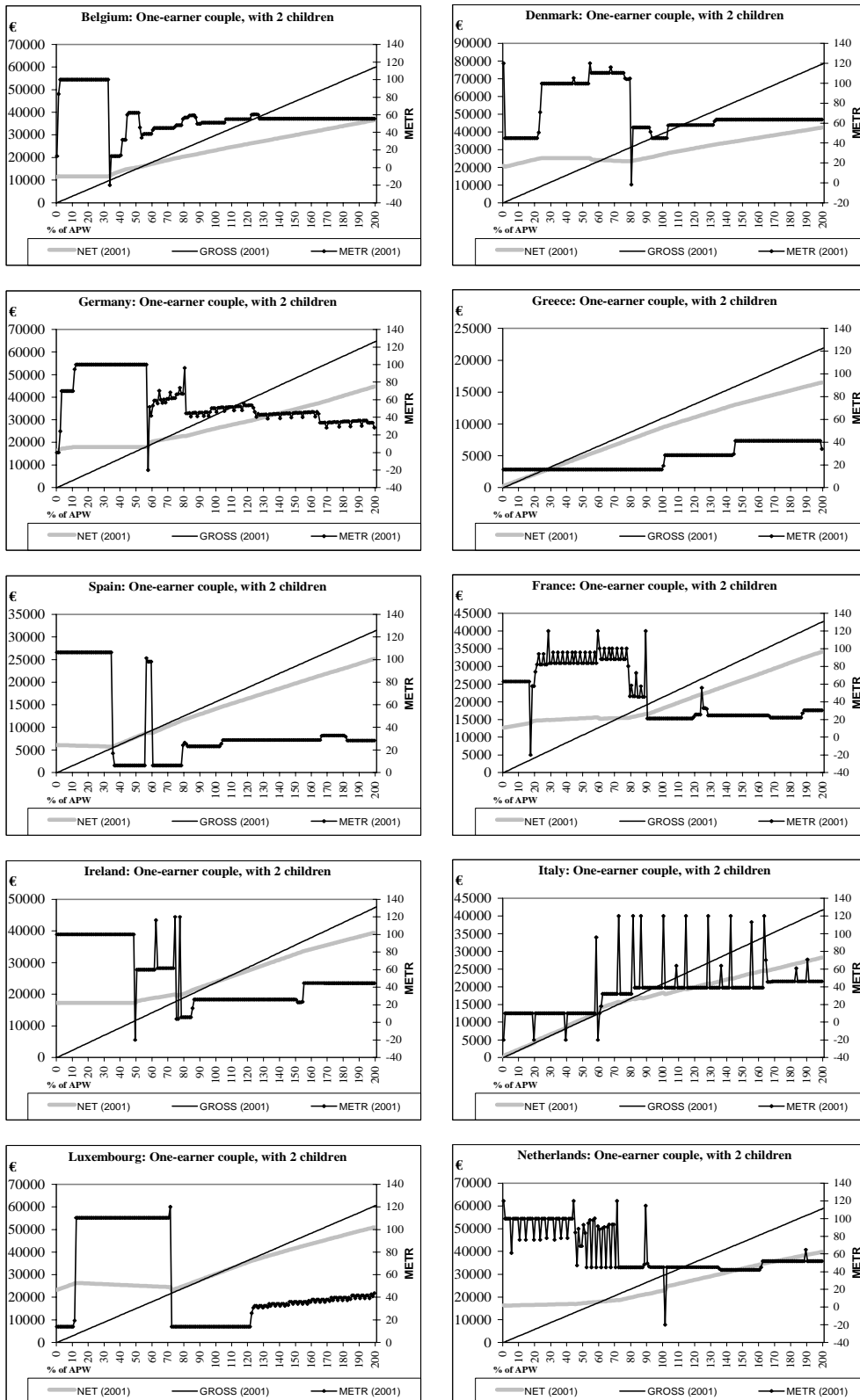


Source: Joint EC-OECD project, using OECD Tax-Benefit models.
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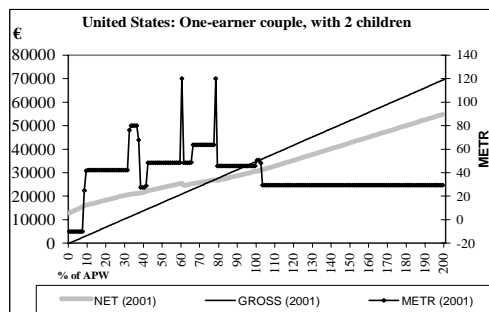
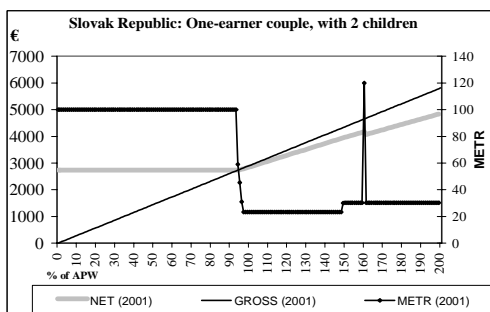
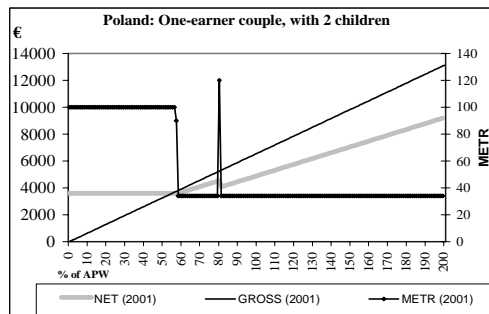
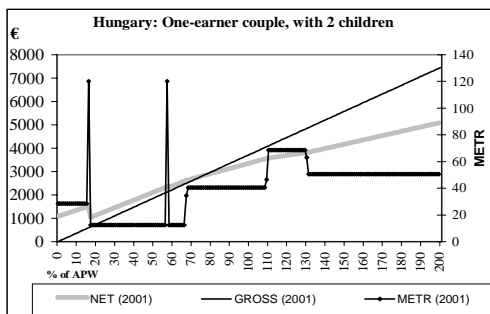
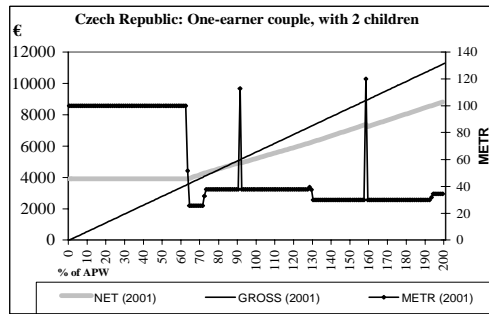
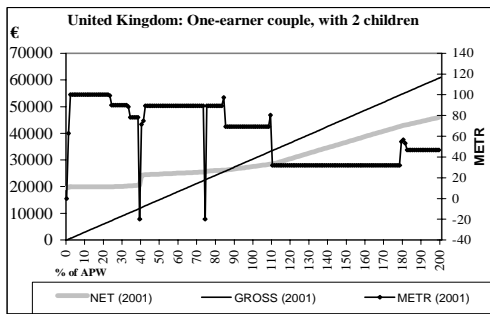
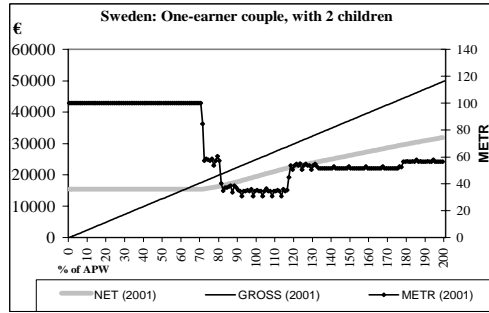
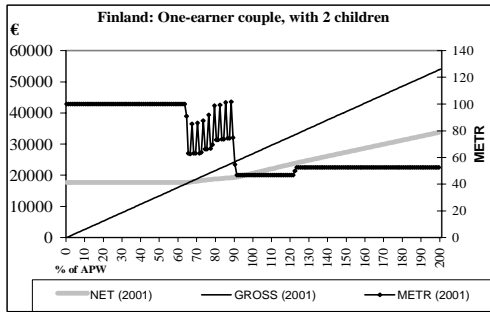
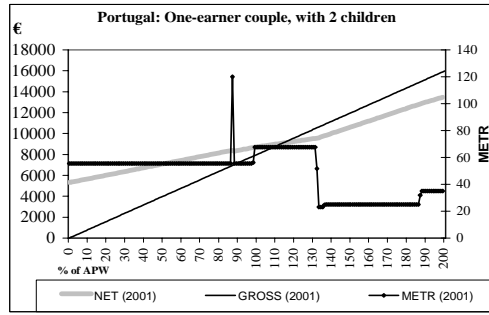
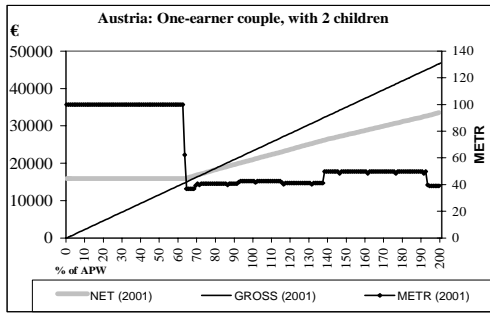


Source: Joint EC-OECD project, using OECD Tax-Benefit models.
Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).

Figure 4 – METR_{1w} for one-earner couple with 2 children, 2001

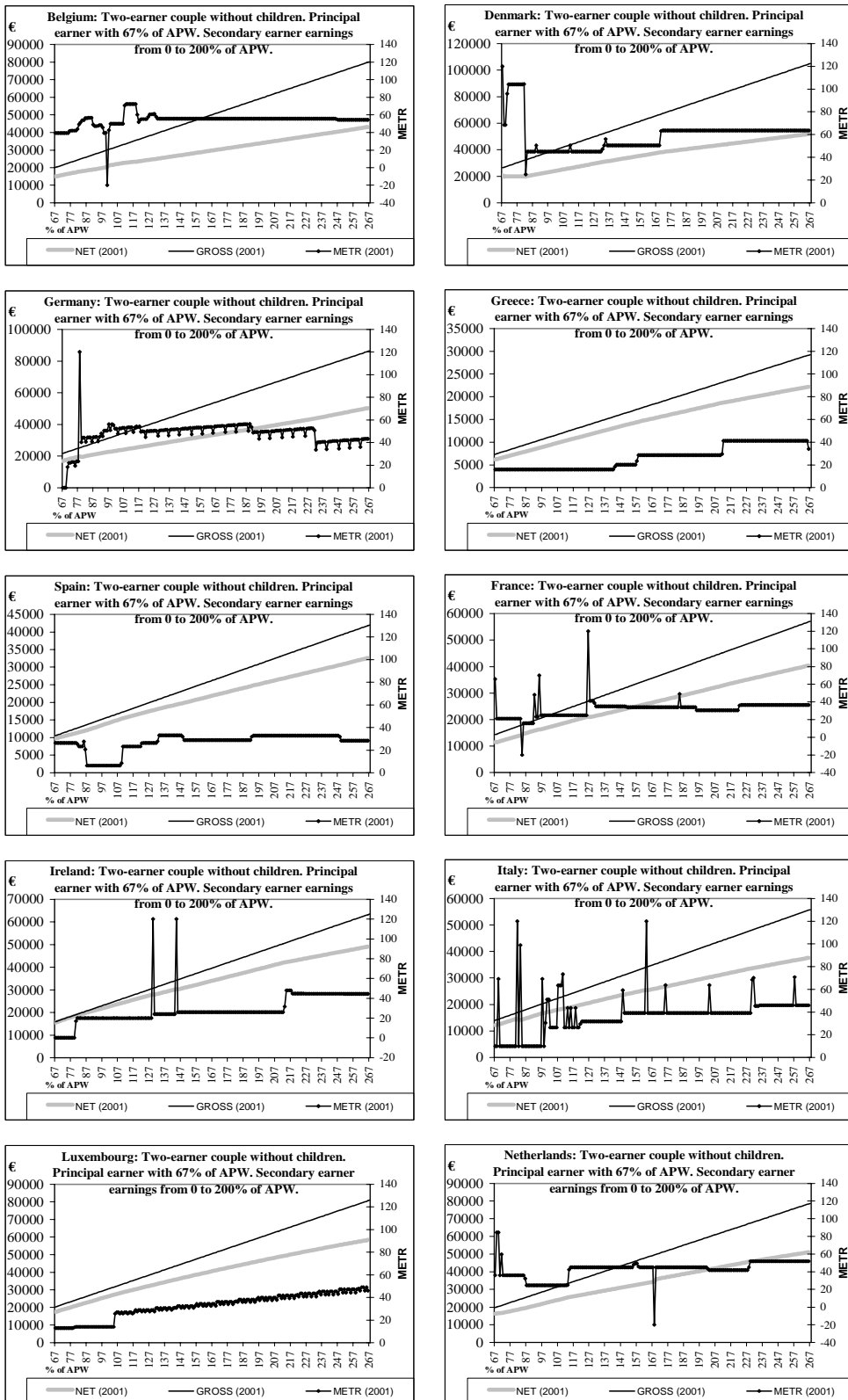


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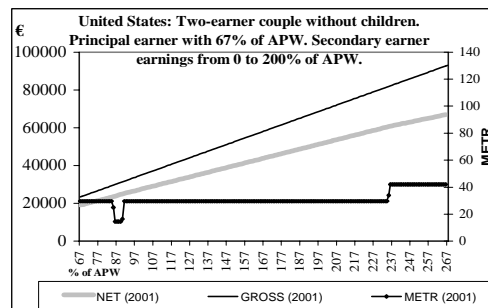
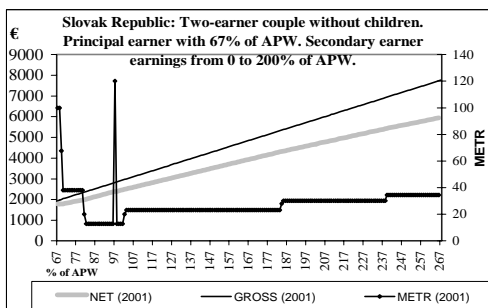
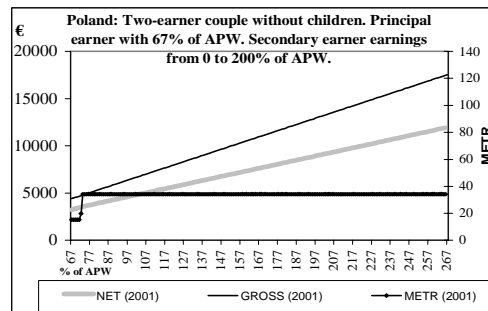
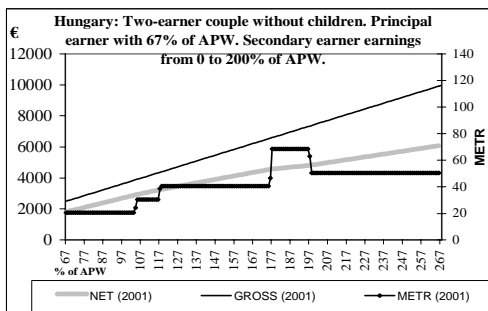
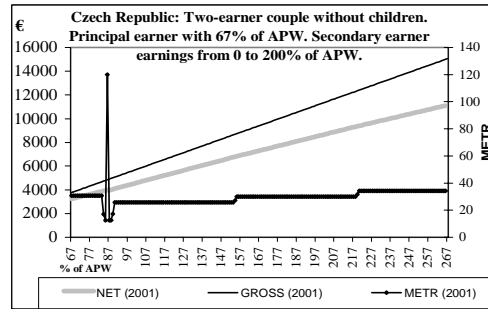
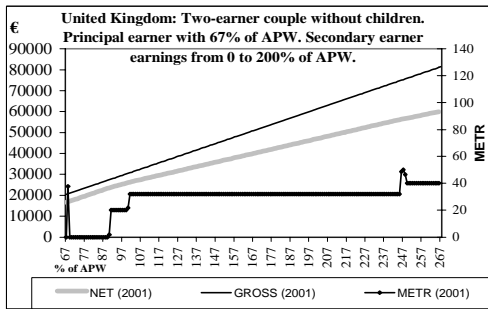
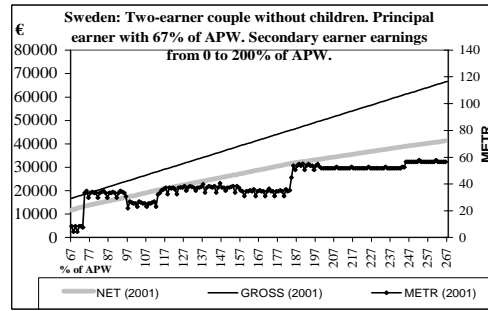
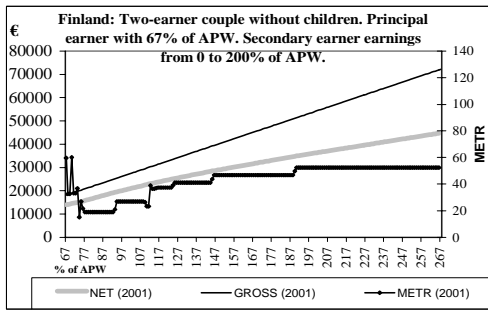
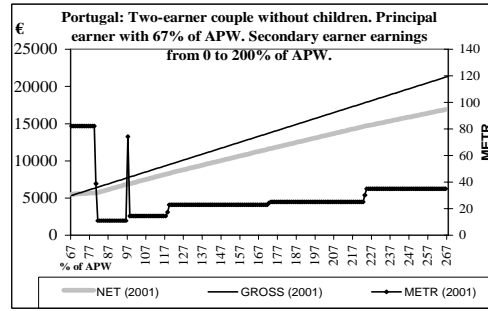
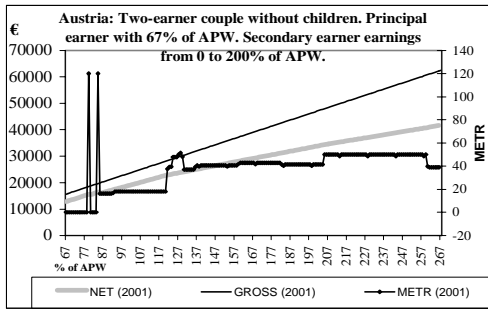


Source: Joint EC-OECD project, using OECD Tax-Benefit models. Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).

Figure 5 – METR_{IW} for two-earner couple without children, 2001

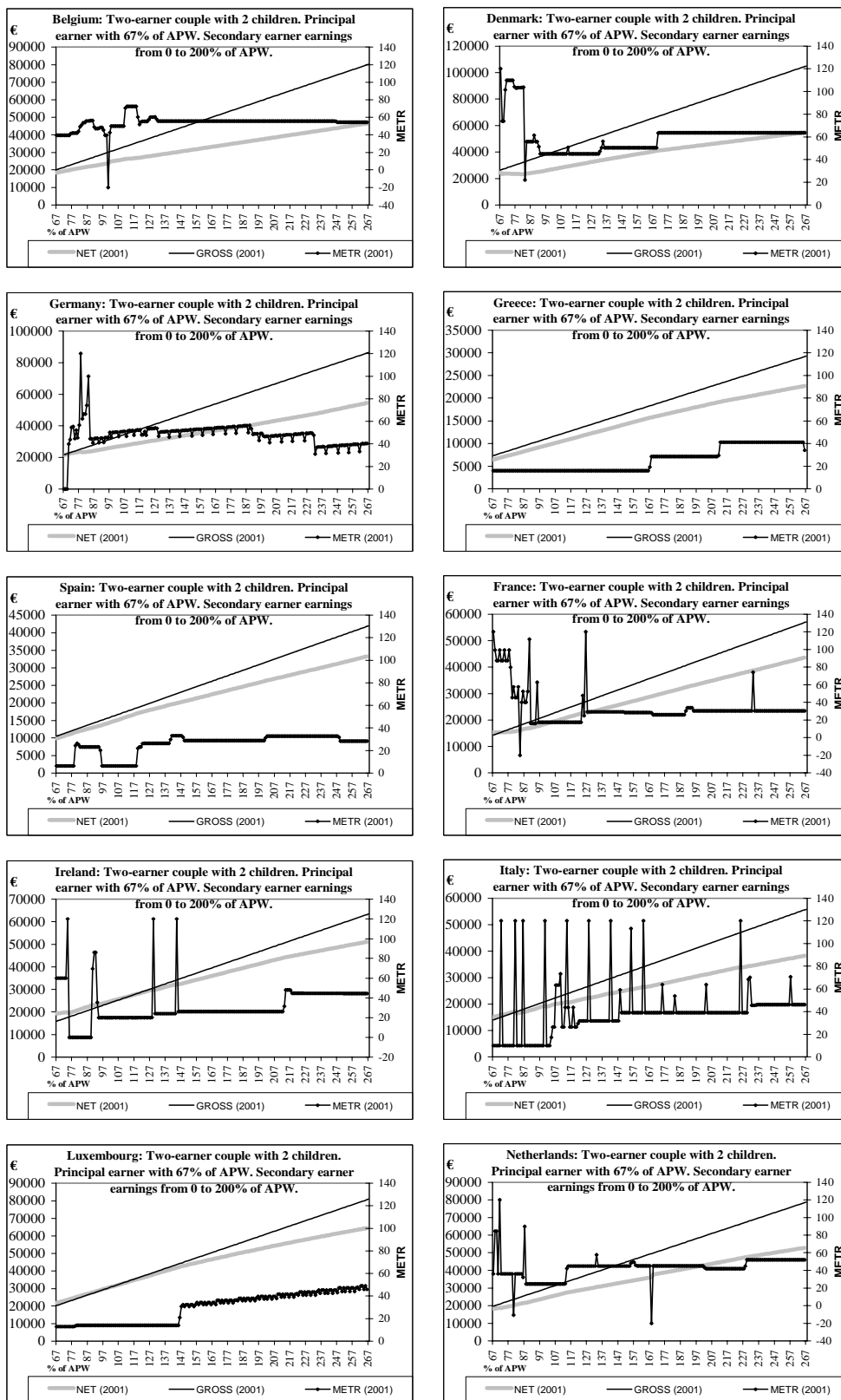


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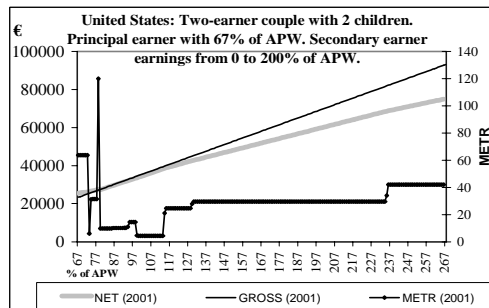
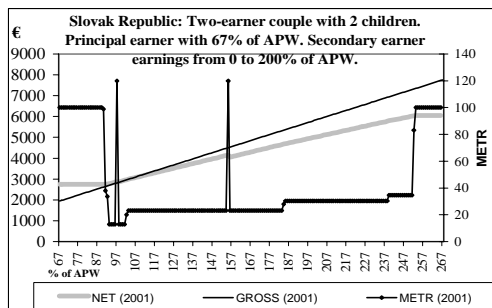
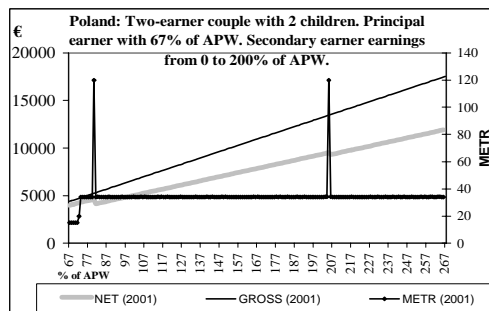
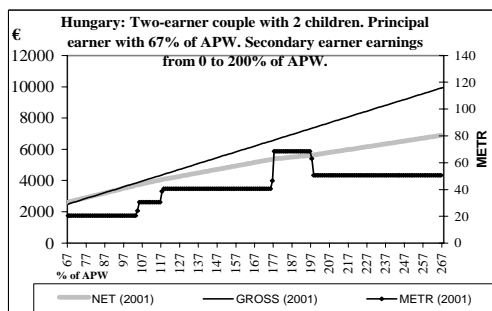
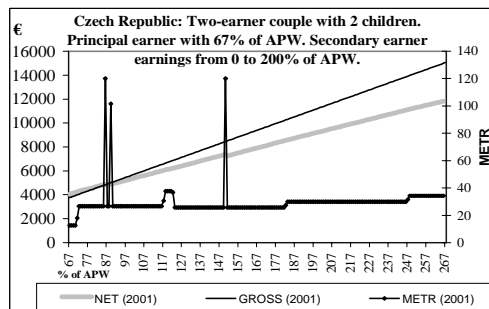
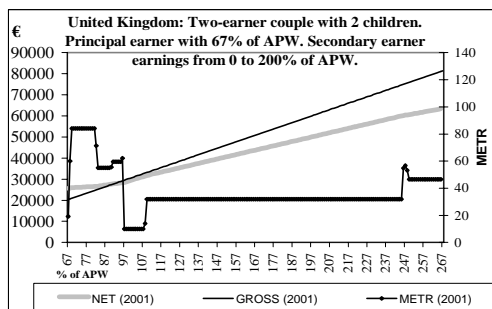
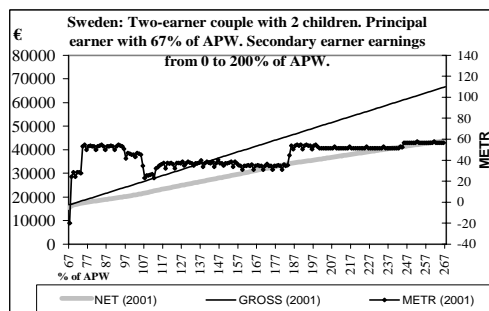
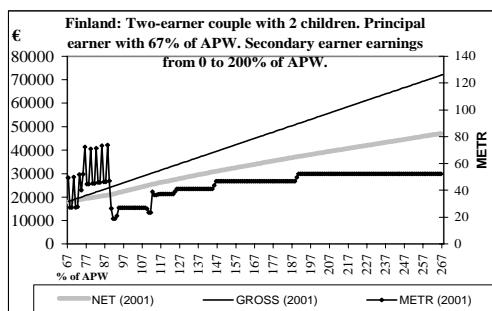
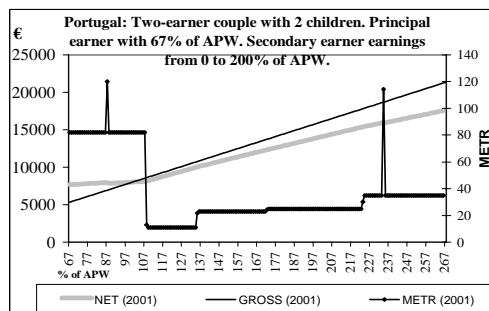
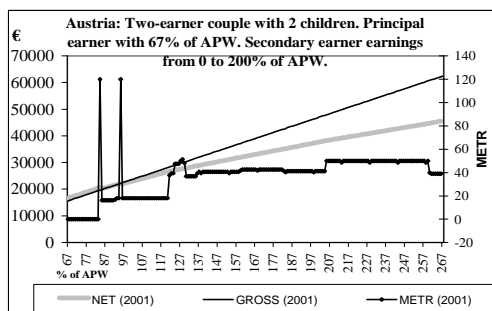


Source: Joint EC-OECD project, using OECD Tax-Benefit models. Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).

Figure 6 - METR_{1w} for two-earner couple with 2 children, 2001



Source: Joint EC-OECD project, using OECD Tax-Benefit models. Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).



Source: Joint EC-OECD project, using OECD Tax-Benefit models. Where applicable, Euro amounts are derived using average 2001 exchange rates (source: Eurostat).

III.2 Marginal effective tax rate relating to the “unemployment trap”.

43. The above analysis has focussed on measuring to what extent any incremental change in gross earnings feeds through to net income levels for people already in employment. The unemployment and inactivity traps, by contrast, are related to the net income effects of transitions between employment and non-employment and, in particular, how the relative gain from employment is affected by tax and transfer policies. While the formal representation of the relevant marginal tax rate indicators (see equation 1a) is equivalent to the $METR_{lw}$ measure discussed in the previous section, their interpretation for policy purposes is different. Indeed, and as we have argued above, policies aimed at making work pay often face a trade-off between providing incentives at the “extensive” and “intensive” margins of labour supply: policies that improve the incentive situation in terms of participation may create financial disincentives for those already in work.

44. **Definition:** The marginal effective tax rate for an unemployed person ($METR_{ut}$) can be used as an indicator of the size of the so-called unemployment trap. It aims to measure the short-term financial incentives to move from unemployment (where unemployment benefits are received) into paid employment and is defined as the rate at which taxes increase and benefits (mainly unemployment benefits) decrease as an unemployed person takes up a given job.

45. The $METR_{ut}$ thus measures what part of in-work earnings is effectively “taxed away” when moving into work. When measuring the financial consequences of moving into work, a critical question is, what hourly wage the job pays and how many hours the person works. In our calculations we assume a transition into a full-time job. For computing unemployment benefits in the unemployed situation, the characteristics of the previous job are also relevant. We assume that the previous job was also full-time with previous earnings amounting to 67% APW (Table 6) and 100% APW (Table 7). In countries with earnings-related unemployment benefits this will obviously have an impact on the level of out-of-work income (y_{netA} and y_{grossA} in equations 1a and 1b).²⁴ For low-income families, any topping-up of incomes with means-tested benefits (such as social assistance where available) is taken into account in both the in-work and out-of-work situation (i.e., it is assumed that people in fact apply for the benefits they are entitled to and that they do not have assets or other characteristics that disqualify them from receipt).

46. All simulations look at the level of unemployment benefits during the second month of unemployment (i.e., after expiration of any waiting periods) and, in order to show the maximum benefit available and as explained in section II, assume an uninterrupted work history of 22 years and, importantly, that unemployment is involuntary. In interpreting the figures on the risk of an unemployment trap, one should consider that for those entitled, the duration of the unemployment benefit is often limited and that benefit receipt is also conditional upon other eligibility criteria (see Table 5). In particular, job-search requirements and their enforcement can differ considerably across countries and this will need to be borne in mind especially when comparing computed $METR_{ut}$ measures across countries. Furthermore, in many countries unemployment benefits are reduced over time ($METR_{ut}$ would therefore decline in these cases) and those judged to be leaving a job voluntarily may not be entitled to receive unemployment benefits at all.²⁵ In short, our computed amounts of unemployment benefit will often represent an “upper bound”

24. The benefit level is generally related to previous earnings but may also be influenced by other factors such as employment record, age and family situation, and is usually subject to floors or ceilings. Depending on the level of in-work earnings, any non-earnings-related elements of benefit payments (such as floor or ceilings) can give rise to very high or very low out-of-work incomes relative to in-work incomes.

25. For instance, the payment rate in Belgium decreases over time from 60% to 43% for a single person. For couples with children, when need is proven, the payment rate can continue at 60% for a prolonged period. In the Czech Republic, France, the Slovak Republic and Spain, payment rates decrease over time for all family situations. In France, the decrease of UI benefits is graduated and depends on the duration of contribution and the age of the claimants. The maximum duration of benefit payments is either fixed or depends on the employment record (Austria, France, Germany, Greece, Hungary, the Netherlands, Poland, Spain) or age (Austria, Finland, France, Germany, Greece, Luxembourg, the Netherlands, Portugal, Sweden). See EC-MISSOC 2002 and OECD (2002a) for details.

while unemployment benefits (and thus $METR_{ut}$) may be lower for those with shorter work histories or longer unemployment spells. In order to provide some measure of the sensitivity of results to these modelling assumptions as well as the relevant range of possible values, section III.3 on “inactivity traps” below considers a situation where people are not entitled to unemployment benefits at all (or where unemployment benefits have expired).

47. Since re-entry wages for unemployed persons may be different from wages received in the previous job, we consider a range of different scenarios in Tables 6 and 7.²⁶ In annex A (Figures A1-A6), we also present $METR_{ut}$ (and $METR_{it}$) results for a continuous range of re-entry wage levels from 50% to 200% of APW. Similar to section III.1 we have decomposed the $METR_{ut}$ measures in terms of the tax-benefit instruments that drive them (Table A2–A3 in the annex).

48. Looking at the third column of Table 6 (see also panel 3 in table A2.1 in the annex), we see that for an unemployed person (a single adult without children) previously employed at a low wage level of 67% of APW and taking up a new job paying the same wage, $METR_{ut}$ is close to 90% in Belgium, Denmark, Germany, France, Luxembourg, the Netherlands, Portugal, Sweden. In other words, the short-term net financial reward for taking up a job is only 10% of gross earnings. In most of these countries, this high $METR_{ut}$ is due to the loss of rather generous unemployment benefits. In Belgium, part of the high $METR$ is also due to a rather large increase in taxes when taking up a job (at a rate of 21% of gross earnings). Obviously, taking up a job paying a wage lower (higher) than the wage before unemployment implies higher (lower) $METR_{ut}$. Take the case of a return to work with a re-entry wage equivalent to 50% of APW earnings²⁷ (Table 6, first column in each panel). A single with a pre-unemployment wage of 67% of APW earnings may see his/her disposable income fall to a level lower than in the case where he/she remains unemployed. This unemployment trap is indicated by a $METR_{ut}$ in excess of 100% in nine Member States (Belgium, Denmark, Germany, Greece, Spain, France, Luxembourg, Portugal and Sweden). Of course this is only true for as long as the person remains entitled to unemployment benefits. If benefits are withdrawn as a result of the unemployed person’s refusal to accept the lower paid job, then the alternative to low-paid work may be social assistance benefits or no income at all and much lower $METR_{ut}$.

26. The literature on the “cost” of job loss refers to the interaction of several mechanisms, such as the erosion of human capital skills or considerations of social stigma, that lead to deteriorating wage prospects following a period of unemployment (see Kletzer, 1998). On the other hand, prospective wages may have improved due for example to training measures.

27. As shown in Table 1, 50% of APW is close to the statutory minimum wage in several Member States.

Table 5 - Unemployment benefit systems in the EU
(2001)

Country	Benefit duration, months		Waiting period days	Entitlement conditions (UI), months (2)
	Unemployment insurance (1)	Unemploym. assistance		
Belgium	No limit	None	0	14 / 18
Denmark	48	None	0	12 / 36
Germany	6 - 32	Unlimited	0	12 / 36
Greece	5 - 15	None	6	6 / 14
Spain	4 - 24	6-18	0	12 / 72
France	4 - 60	Unlimited	7	4 / 8
Ireland	15	Unlimited	3	9 / 12
Italy	6 - 9	None	0	12 / 24
Luxembourg	12-24	None	0	6 / 12
Netherlands	6 - 60	24	0	6 / 9
Austria	5 - 16	Unlimited	0	12 / 24
Portugal	12 - 30	6-15	0	18 / 24
Finland	23	Unlimited	7	10 / 24
Sweden	14	5	5	6 / 12
UK	6	None	3	None

Sources: EC-MISSOC 2002; OECD(2002a)

(1) The duration of unemployment insurance may vary according to the duration of the employment record (contribution period), the age and the family situation of the beneficiary.

(2) Expressed in terms of months that the unemployed person must have been employed and contributing to the insurance scheme (the first figure) during a certain period of time prior to unemployment (the latter figure)

49. It is interesting to note (Panels 1 and 2 in Tables A2.2, A2.3 and A2.4 in the annex) that for a very low-income (up to 50% of APW) single parent or one-earner household, the income support provided by social assistance programmes while *in work* makes METRs lower than they would otherwise have been in some member states (Denmark, France, Luxembourg, Portugal and Sweden). Indeed, transfers from social assistance schemes reduce the negative impact on net incomes from the complete withdrawal of the unemployment benefits transfers when moving into work. While social assistance may in some countries also be received as a top-up to low unemployment benefits, employment-conditional benefits (or tax credits) are, of course, only available while in work (in Tables A1-A3 in the annex tax credits are shown as part of income tax component -IT - while family-related in-work benefits and tax credits are included in component FB). These in-work benefit schemes are designed to significantly raise in-work income for low-wage families above out-of-work income levels. As discussed in section III.1, the resulting reduction in $METR_{ut}$ is the intended positive effect on participation incentives which needs to be traded off against an increase of $METR_{iw}$ as a result of phasing out in-work benefits at higher income levels.

Table 6 - Unemployment trap (2001)

Marginal effective tax rate for an unemployed person
(previous work= 67% of the APW wage level) returning to work at a wage equivalent to:

% of APW	Single				Single parent, 2 children				1 earner couple			
	50%	67%	100%	150%	50%	67%	100%	150%	50%	67%	100%	150%
BE	100	89	78	71	91	82	74	68	92	80	70	65
DK	107	91	78	73	104	97	83	76	73	83	77	71
DE	100	88	77	70	100	93	79	70	100	88	74	65
GR	101	79	60	50	107	84	61	51	101	79	60	50
ES	100	81	65	53	100	82	62	51	100	77	61	50
FR	103	87	70	59	89	92	76	60	87	89	68	55
IE	87	73	59	54	50	54	60	53	100	87	68	54
IT	69	60	53	49	74	53	54	52	67	57	53	49
LU	107	88	71	63	104	89	64	57	102	107	79	63
NL	93	85	72	60	92	87	75	62	96	91	77	63
AT	88	75	64	57	99	84	69	61	100	86	71	62
PT	111	88	67	55	77	72	63	52	77	72	65	51
FI	90	81	69	63	94	88	79	70	97	91	78	69
SE	105	87	70	62	103	91	80	69	100	98	78	67
UK	78	70	58	49	45	56	65	57	84	82	66	55
CZ	80	67	54	46	94	80	67	57	92	79	64	53
HU	84	75	64	61	89	71	61	59	84	75	64	61
PL	92	77	63	53	86	84	68	57	94	78	63	54
SK	88	77	59	49	100	91	72	59	100	100	80	62
NO	89	75	62	57	96	87	79	67	101	83	67	59
SZ	115	92	71	58	100	92	69	56	100	95	71	57
US	85	71	57	51	59	63	58	49	83	75	60	50
JP	94	74	56	45	103	95	70	55	84	71	54	43

% of APW	1 earner couple with 2 children				2 earners couple *				2 earners couple with 2 children*			
	50%	67%	100%	150%	50%	67%	100%	150%	50%	67%	100%	150%
BE	87	76	68	64	99	89	78	70	99	89	78	70
DK	76	87	82	75	107	91	78	73	107	91	78	73
DE	100	85	75	65	99	86	75	67	114	98	83	72
GR	107	84	61	51	101	79	60	50	107	84	61	51
ES	100	82	61	50	100	81	65	53	103	83	65	54
FR	78	84	76	59	104	88	70	58	104	87	68	55
IE	95	87	72	57	54	48	42	37	72	61	51	43
IT	78	54	53	53	75	64	56	51	80	70	62	55
LU	101	104	83	64	102	83	66	57	115	89	68	58
NL	94	90	78	63	89	78	67	57	89	78	67	57
AT	100	97	78	67	80	69	60	54	86	74	63	56
PT	55	55	57	56	114	91	68	54	111	86	65	52
FI	100	99	89	76	82	71	63	58	91	78	67	61
SE	100	100	84	71	105	87	70	62	105	87	70	62
UK	66	72	74	62	43	41	38	36	54	49	43	39
CZ	100	96	77	63	76	63	51	44	77	65	55	46
HU	89	71	61	59	84	73	62	60	84	73	62	60
PL	100	91	80	65	77	66	55	48	77	66	55	51
SK	100	100	96	72	85	69	54	45	85	69	58	48
NO	99	92	73	63	89	75	62	57	94	78	64	59
SZ	100	100	75	59	108	88	68	56	109	88	68	56
US	59	62	60	50	85	71	57	48	83	69	56	47
JP	84	86	71	56	95	75	56	45	91	71	56	44

* The wage level of the first earner is fixed at 67% of the APW, while the wage level of the second earner is indicated in each column

Source: Joint European Commission-OECD project, using OECD Tax -Benefit models.

Table 7 - Unemployment trap (2001)

Marginal effective tax rate for an unemployed person
(previous work= 100% of the APW wage level) returning to work at a wage equivalent to:

% of APW	Single				Single parent, 2 children				1 earner couple			
	50%	67%	100%	150%	50%	67%	100%	150%	50%	67%	100%	150%
BE	100	89	78	71	91	82	74	68	92	80	70	65
DK	107	91	78	73	104	97	83	76	73	83	77	71
DE	101	88	77	70	115	104	87	75	100	88	74	65
GR	112	88	66	54	126	98	71	57	120	94	70	56
ES	129	103	79	63	138	110	81	64	135	103	78	62
FR	120	100	79	65	101	100	82	63	100	99	74	60
IE	87	73	59	54	50	54	60	53	100	87	68	54
IT	92	77	65	56	100	73	67	61	93	76	67	58
LU	144	115	89	75	154	126	89	73	118	119	87	69
NL	110	98	80	65	104	97	81	66	102	96	81	65
AT	96	81	68	60	106	89	73	63	100	86	71	62
PT	141	110	81	65	107	94	78	62	107	94	79	61
FI	99	88	73	66	104	95	84	73	99	92	79	69
SE	133	109	85	72	123	106	90	76	114	109	85	72
UK	78	70	58	49	45	56	65	57	84	82	66	55
CZ	97	80	62	52	94	80	67	57	95	81	66	54
HU	84	75	64	61	89	71	61	59	84	75	64	61
PL	92	77	63	53	86	84	68	57	94	78	63	54
SK	111	95	71	57	101	92	72	59	100	100	80	62
NO	117	95	76	67	113	99	88	73	117	95	76	65
SZ	143	113	84	67	145	126	92	71	124	113	83	65
US	108	88	69	59	68	70	63	52	100	88	69	56
JP	116	91	67	52	92	88	65	52	106	88	65	50

% of APW	1 earner couple with 2 children				2 earners couple*				2 earners couple with 2 children*			
	50%	67%	100%	150%	50%	67%	100%	150%	50%	67%	100%	150%
BE	87	76	68	64	99	89	78	70	99	89	78	70
DK	76	87	82	75	107	91	78	73	107	91	78	73
DE	115	95	82	70	118	101	85	74	138	116	95	80
GR	126	98	71	57	112	88	66	54	126	98	71	57
ES	139	111	80	63	129	103	79	63	140	111	84	66
FR	89	92	81	62	120	100	78	63	122	100	76	61
IE	95	87	72	57	54	48	42	37	72	61	51	43
IT	104	73	66	62	92	77	65	56	95	81	69	60
LU	113	112	89	68	139	111	85	69	155	119	88	71
NL	102	96	82	66	115	97	80	65	114	97	80	65
AT	100	97	78	67	101	85	70	61	107	89	73	63
PT	67	64	63	60	144	113	83	64	141	108	80	61
FI	100	99	89	76	98	83	71	64	106	89	75	66
SE	104	103	86	73	133	109	85	72	133	109	85	72
UK	66	72	74	62	43	41	38	36	54	49	43	39
CZ	100	96	77	63	100	81	63	52	97	80	65	53
HU	89	71	61	59	84	73	62	60	84	73	62	60
PL	100	91	80	65	77	66	55	48	77	66	55	51
SK	100	100	96	72	118	94	71	56	118	94	75	59
NO	109	99	78	66	117	95	76	67	122	99	78	68
SZ	134	125	92	70	134	107	81	65	150	118	89	69
US	68	68	64	53	108	88	69	56	108	87	68	55
JP	84	86	71	56	117	92	67	52	113	87	67	52

* The wage level of the first earner is fixed at 67% of the APW, while the wage level of the second earner is indicated in each column

Source: Joint European Commission-OECD project, using OECD Tax -Benefit models.

50. The $METR_{ut}$ faced by a single unemployed with a former wage of 100% APW is broadly similar for low re-entry wages (Table 7). Yet, when taking up a new job at the same wage level as before unemployment, $METR_{ut}$ are generally lower than those faced by low-wage workers (compare columns 2-3 in Table 6 and Table 7). It is also interesting to note the differences across family types. The risk of an unemployment trap is usually higher for a one-earner couple with two children than for a single person.

Table 8 – Net Replacement Rates for unemployed persons (2001)

% of APW	Single				Single parent, 2 children				1 earner couple			
	50%	67%	100%	150%	50%	67%	100%	150%	50%	67%	100%	150%
BE	82	83	63	46	84	79	63	48	81	73	55	41
DK	92	85	60	45	94	96	76	61	71	86	63	47
DE	100	81	61	62	100	92	82	78	100	85	63	51
GR	101	76	58	58	108	81	66	65	101	76	63	63
ES	77	78	74	52	84	81	79	66	75	76	75	53
FR	94	83	71	70	86	92	78	70	82	87	67	69
IE	87	69	50	38	70	65	59	45	113	87	64	45
IT	47	50	52	39	55	54	60	49	48	50	56	43
LU	78	85	85	87	90	90	89	92	110	108	84	85
NL	91	80	71	61	93	87	77	66	96	89	73	63
AT	85	68	55	55	100	84	70	64	100	82	60	56
PT	112	86	78	83	83	75	76	80	81	73	76	79
FI	83	74	61	48	92	89	82	67	97	88	69	54
SE	97	82	78	56	90	92	89	69	100	98	78	56
UK	76	64	45	31	66	65	62	46	84	78	56	39
CZ	63	57	51	50	95	80	63	58	92	75	57	52
HU	64	65	47	35	76	73	58	46	64	65	47	35
PL	89	68	47	32	85	80	56	38	92	70	48	33
SK	79	72	64	47	100	92	72	56	100	100	75	52
NO	94	66	66	53	92	89	86	68	93	78	67	53
SZ	100	90	80	81	100	92	91	91	100	94	80	80
US	68	63	58	42	60	64	56	40	69	70	60	41
JP	74	70	60	60	88	83	60	60	83	67	59	58

% of APW	1 earner couple with 2 children				2 earners couple				2 earners couple with 2 children			
	50%	67%	100%	150%	50%	67%	100%	150%	50%	67%	100%	150%
BE	80	74	58	45	95	91	78	63	96	92	80	67
DK	71	84	75	58	96	93	77	64	96	93	78	66
DE	100	84	78	70	93	90	85	80	98	99	96	91
GR	108	81	66	65	101	88	75	72	103	91	80	76
ES	84	81	78	66	90	89	85	68	94	90	89	78
FR	79	85	78	69	96	92	82	79	96	92	83	79
IE	97	90	72	53	79	71	59	47	88	80	68	55
IT	58	57	62	52	79	77	71	59	83	81	76	62
LU	118	116	89	89	91	90	89	88	95	94	92	91
NL	95	89	77	65	85	85	83	74	86	86	84	75
AT	100	97	76	66	82	80	76	72	88	86	81	76
PT	75	69	66	78	107	95	88	88	105	92	87	87
FI	100	99	85	65	84	81	75	66	90	86	80	70
SE	100	100	82	61	91	91	87	71	92	92	88	72
UK	78	76	71	53	71	63	53	42	79	72	60	49
CZ	100	96	75	59	80	77	72	67	84	80	75	70
HU	76	73	57	46	83	81	68	57	87	85	73	63
PL	100	90	73	51	86	76	62	48	87	77	63	50
SK	100	100	96	69	84	81	78	64	86	84	83	69
NO	100	91	74	59	86	83	80	69	90	87	83	72
SZ	100	100	91	91	93	92	86	84	94	93	92	91
US	66	65	59	42	84	81	75	59	85	83	78	63
JP	89	87	68	59	90	86	77	73	88	84	78	73

Net replacement rates are calculated on the first month of unemployment.

Source: Joint European Commission-OECD project, using OECD Tax-Benefit models.

51. To conclude this section, it is worth recalling that a widely used alternative but related indicator of $METR_{ut}$ is the net replacement rate (NRR, see footnote 9). To complement the information provided by the $METR_{ut}$ measures, we have computed a range of NRRs at low and average wage levels (Table 8). These NRRs are computed for a transition from full-time jobs paying wages between 50% and 150% of APW to unemployment (as before, with the unemployment benefit being computed for the second month of unemployment; all other definitions are also similar to the ones used for computing the $METR$ measures).

III. 3 Marginal effective tax rates relating to the “inactivity trap”

52. The measures examined in this section are similar to the previous one except that we now look at the financial disincentives to move into work for individuals looking for a job but who are not or no longer entitled to unemployment benefits (such as those in long-term unemployment or without an employment record).²⁸ This means that we are considering as a starting point for the calculation of the $METR_{it}$ a hypothetical individual living in a household where the only source of net out-of-work income is provided through benefits other than unemployment benefits or through the earnings of a spouse.

53. **Definition:** The marginal effective tax rate for an “inactive” person ($METR_{it}$) can be used as an indicator of the size of the so-called inactivity trap. It aims to measure the short-term financial incentives to move from inactivity, unpaid work or unemployment where no unemployment benefits are received into paid employment and is defined as the rate at which taxes increase and benefits (mainly minimum income or social assistance benefits) decrease as a person takes up a given job.

54. Except for the receipt of unemployment benefits, all other modelling assumptions are the same as in section III.2 above. Table 9 reports estimates of $METR_{it}$ faced by “inactive” persons deciding to take up full-time employment. As in the previous section we have calculated $METR_{it}$ for a move into work at different gross wage levels. Decomposition of the $METR_{it}$ in terms of underlying tax-benefit instruments are reported in Table A4 in annex A. As with the $METR_{ut}$ results in the previous section, Figures A1-A6 in annex A show $METR_{it}$ over a broad range of re-entry wages (50-200% of APW).

55. We start by looking at the results for taking up employment with very low earnings of 33% of the APW wage level corresponding, in most cases, to a low-wage part-time job. For these jobs, Table 10 demonstrates that all one-earner household types considered in our analysis face a high risk of and inactivity trap in at least eight Member States. In fact, METRs are close to or higher than 90-100% in the following countries: Belgium, Denmark, Luxembourg, Ireland (but not for single parents with children), Netherlands, Austria, Finland and Sweden. In the short-term there is no or only very little financial gain for recipients of means-tested benefits to take up employment. For very low entry wages this is to be expected and is, again, due to the withdrawal of social assistance and, in some countries, housing benefits.

56. Given that these types of benefits tend to provide larger amounts for families with children, we find high METRs for the breadwinner of one-earner couples with two young children. In seven of the countries shown, taking up a job with a wage close to 50% of APW earnings does not translate into an increase of overall net income compared to the out-of-work situation. There is therefore a higher risk that social assistance recipients might remain trapped in long-term benefit dependence. The short-term financial incentive to take up a job remains very low up to wage levels of 67% of APW in most of these countries.

28. Following the expiration of unemployment insurance benefits, jobless persons often continue to receive unemployment assistance (e.g., Austria, France, Germany, Greece, the Netherlands, Portugal, Spain, Sweden). In most countries, benefits of last resort (minimum income, social assistance) exist for those not entitled to any unemployment benefits. Exceptions are Greece and Italy where no such schemes exist on a national level.

Table 9 - Inactivity trap indicator (2001)
Marginal effective tax rate when moving from social assistance to work
at a wage level equivalent to:

% of APW	Single					Single parent, 2 children					1 earner couple				
	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%
BE	85	71	67	64	61	97	77	71	67	63	97	78	69	63	61
DK	96	96	83	72	69	84	92	87	76	72	34	59	73	70	67
DE	84	90	80	71	67	84	90	85	74	67	84	90	81	69	62
GR	16	16	16	18	22	16	16	16	16	20	16	16	16	18	22
ES	69	50	44	40	37	100	68	58	46	40	88	60	47	41	37
FR	81	83	71	60	52	69	75	81	69	55	76	83	86	65	54
IE	100	87	73	59	54	51	50	54	60	53	100	100	87	68	54
IT	10	16	20	27	31	-1	-1	-2	17	27	7	8	13	24	30
LU	89	92	76	63	58	86	94	82	59	54	79	90	98	73	59
NL	97	92	84	72	59	93	82	80	70	59	96	96	92	78	63
AT	100	88	75	64	57	100	99	84	69	61	100	100	86	71	62
PT	55	50	42	36	35	55	55	55	52	45	55	55	55	54	44
FI	100	86	78	67	61	70	65	66	65	60	100	97	91	78	69
SE	100	98	82	67	60	82	63	61	60	56	100	100	98	78	67
UK	80	78	70	58	49	81	45	56	65	57	88	84	82	66	55
CZ	83	70	59	49	43	100	94	80	67	57	100	92	79	64	53
HU	69	55	53	49	51	61	45	38	39	45	69	55	53	49	51
PL	92	72	63	53	47	100	86	84	68	57	100	94	78	63	54
SK	99	81	72	56	46	100	100	91	72	59	100	100	100	80	62
NO	83	85	71	60	56	78	73	69	68	60	93	91	76	63	56
SZ	100	100	81	63	53	100	100	92	69	56	100	100	95	71	57
US	21	29	29	29	33	30	33	43	45	40	18	25	32	31	31
JP	79	69	56	43	36	108	103	95	70	55	79	84	71	54	43

% of APW	1 earner couple with 2 children					2 earners couple*					2 earners couple with 2 children*				
	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%	33%	50%	67%	100%	150%
BE	97	72	65	60	59	46	45	49	51	52	46	45	48	51	52
DK	37	58	74	74	69	56	52	50	50	55	83	70	64	59	61
DE	84	90	77	69	62	42	45	47	48	49	52	51	51	51	51
GR	16	16	16	16	20	16	16	16	18	22	16	16	16	16	20
ES	106	77	64	49	42	18	16	19	23	25	15	12	15	20	23
FR	68	75	82	74	58	21	23	27	30	31	56	43	41	37	34
IE	100	95	87	72	57	12	15	18	22	24	34	29	29	29	29
IT	-5	-4	-7	12	26	28	33	32	35	37	37	44	43	44	43
LU	75	87	93	76	59	14	17	20	24	28	14	14	14	18	24
NL	96	94	90	78	63	35	33	36	39	38	38	35	38	40	39
AT	100	100	97	78	67	21	20	24	30	34	21	20	24	30	34
PT	55	55	55	57	56	42	33	30	28	27	87	73	57	46	39
FI	100	100	99	89	76	25	27	30	35	40	42	38	38	40	43
SE	100	100	100	84	71	27	27	29	32	36	37	37	37	36	40
UK	93	66	72	74	62	7	15	19	24	26	63	49	44	40	38
CZ	100	100	96	77	63	31	29	28	28	29	31	30	30	31	31
HU	61	45	38	39	45	21	23	27	32	40	21	23	27	32	40
PL	100	100	91	80	65	31	32	33	33	33	54	47	44	41	41
SK	100	100	100	96	72	32	28	27	26	27	81	61	51	46	40
NO	100	99	92	73	63	26	29	30	32	37	26	29	30	32	37
SZ	100	100	100	75	59	20	21	23	25	27	20	21	22	24	26
US	30	37	46	49	43	27	28	28	29	29	27	20	22	24	26
JP	79	84	86	71	56	15	16	16	17	18	36	28	24	25	23

* The wage level of the first earner is fixed at 67% of the APW, while the wage level of the second earner is indicated in each column

Source: Joint European Commission-OECD project, using OECD Tax-Benefit models.

57. A move from inactivity to work at the average wage level (100% of APW) of one spouse can still be financially non-rewarding given $METR_{it}$ in excess of 80% for jobless households with children in Finland, Sweden or the Slovak Republic. To recoup a greater part of lost benefits, a job paying more than the average wage is required (a breakdown of the influence of each type of tax-benefit instrument is provided in Table A4.4 of annex A).

58. The results for households with two earners show the financial incentive for the second spouse to move from inactivity to work (in our calculation the first earner is assumed to be employed at 67% of the APW wage level). For families without children, $METR_{it}$ are above average in Belgium, Denmark, Germany and Portugal. In both Portugal and Germany, this is mainly the result of the joint taxation of family income which leads to non-negligible income tax rates for second earners, even at very low earnings levels.

59. Finally, Figure 7 enables one to compare how the fraction of wages that is effectively taxed away changes depending on entry wages. With the exceptions of Greece and Italy, we note high $METR_{it}$ for very low entry wage levels. These are due to the withdrawal of minimum income / social assistance benefits. $METR_{ut}$ are generally even higher since the amount of unemployment benefits lost when entering full-time employment generally exceeds the amounts provided by minimum income schemes. For similar reasons, $METR_{ut}$ are higher for individuals with higher levels of previous earnings. For countries like the UK or

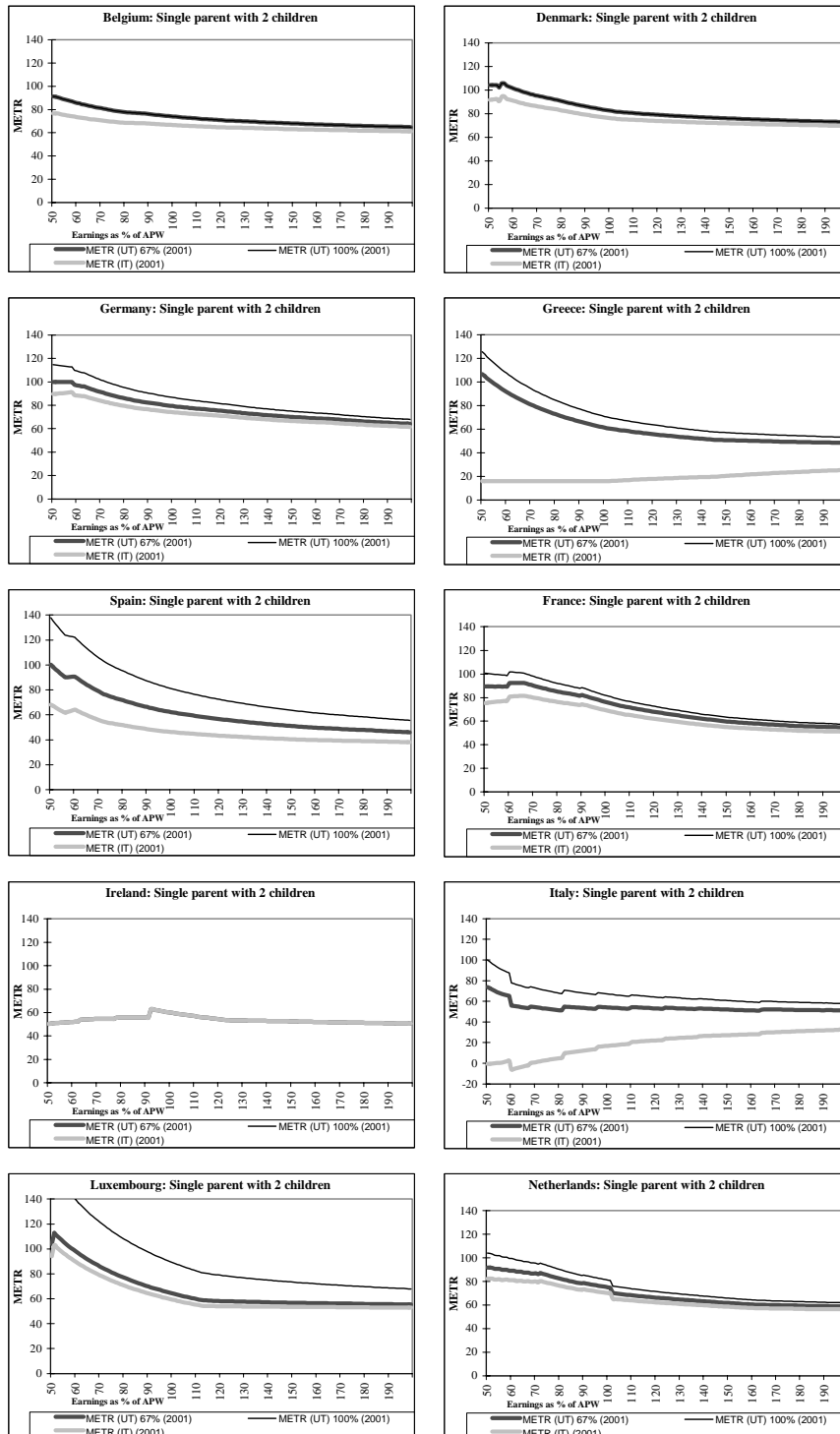
Ireland where unemployment benefits are largely independent of previous earnings, the curves METRs for jobless people with (lines **METR(UT)100** and **METR(UT)100**) and without (line **METR(IT)**) an employment record coincide. For both these countries, we can also see the effect of employment-conditional benefits discussed earlier: as a result of the boost they provide to in-work incomes, the rate at which in-work earnings are effectively taxed away upon entering a new job is strongly reduced. For higher entry wage levels, in-work benefits are phased out so that their dampening effect on $METR_{ut}$ and $METR_{it}$ declines.

60. As mentioned in Box 1, high participation disincentives generated by the tax-benefit system have been found to be more likely to have an impact on labour market behaviour when they concern certain groups of persons, one being lone parents. Single-parent social assistance recipients often face $METR_{it}$ that are higher than for other household types. At the same time, the direct benefit of staying home to engage in unpaid childcare or housework will frequently be larger than in households where there are no children or where responsibilities can be shared. It is interesting to note to what extent recent policy effort to overcome an inactivity trap for these persons in some countries has succeeded in designing appropriate measures. For example, in the UK, $METR_{it}$ for lone parents receiving social assistance are usually lower than for other family types. A lone parent taking up a minimum wage job (50% of APW earnings) will see 45% of his/her earnings “taxed away” while for singles, one-earner couples without children and one-earner couples with children the corresponding $METR_{it}$ are 78%, 84% and 66%, respectively.

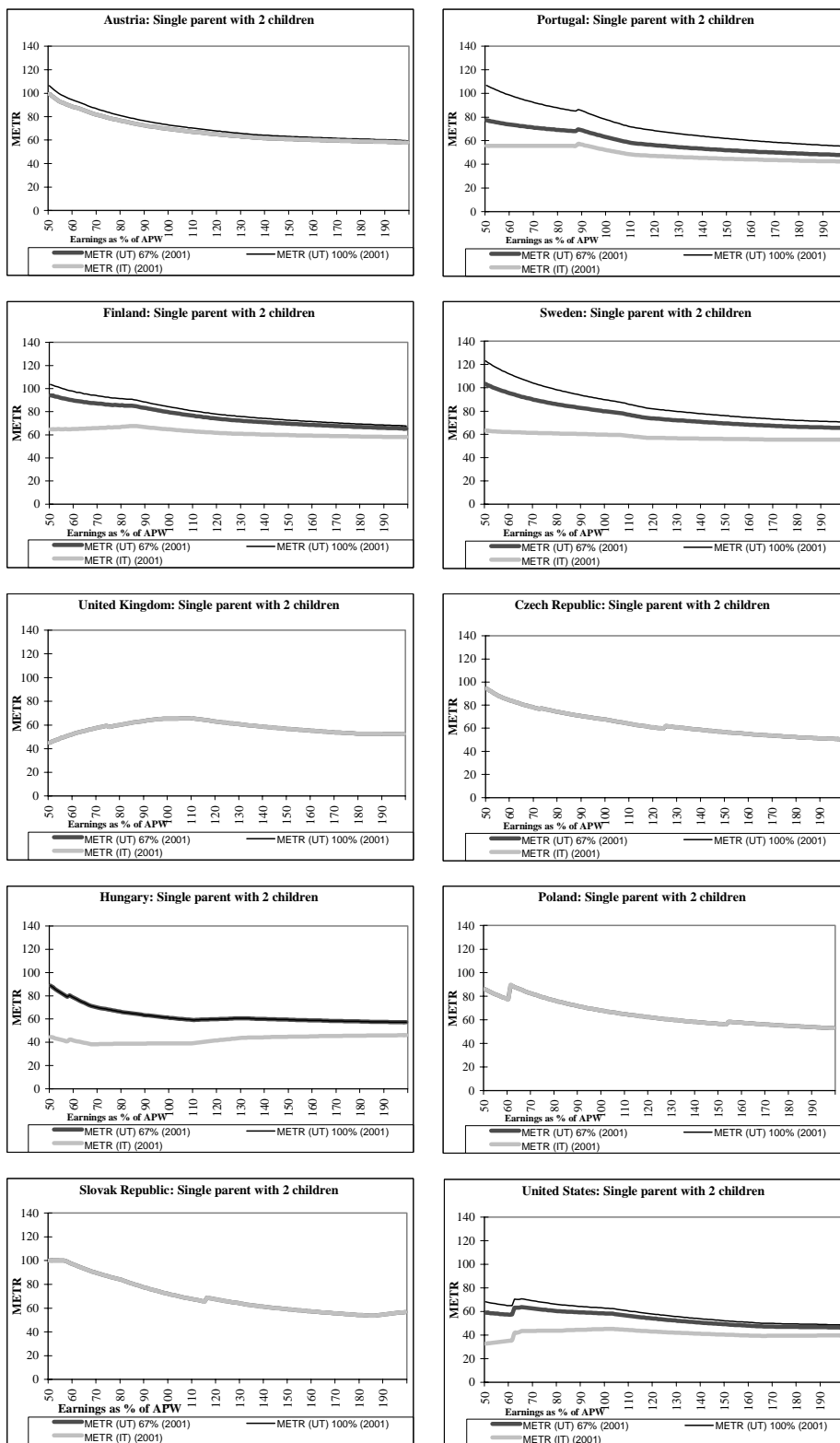
Figure 7 - Unemployment and inactivity trap indicators – 2001
(Excerpt – for full set of figures see Table A.2 in the annex)

The curves show METR values as a function of entry wage levels for

- an unemployed person with UB based on previous wage=100% APW (METR(UT)100%)
- an unemployed person with UB based on previous wage=67% APW (METR(UT)67%)
- a jobless person not receiving any UB (METR(IT))



Source: Joint European Commission-OECD project, using OECD Tax-Benefit models.



Source: Joint European Commission-OECD project, using OECD Tax-Benefit models.

IV. DISCUSSION

61. The scope of the modelling approach taken in this paper has been discussed in some detail in the preceding sections. We have also highlighted some of the limitations and caveats to be borne in mind when interpreting results and, particularly, when comparing them across countries. In this section we briefly re-iterate these issues and discuss how some of them are being addressed in parallel work undertaken jointly by the European Commission and OECD.

62. The results presented in this paper can be characterised in terms of the following features:

1. as *tax-benefit indicators* they describe features of tax-benefit systems as they apply to individuals in specific situations (rather than the country population as a whole), thus they can be considered as policy indicators;
2. as *work incentive indicators* they relate to the financial trade-off applying to individuals' participation and working time/effort decisions (rather than the behavioural response of individuals facing these trade-offs);
3. as *income indicators*, they focus on household disposable income (rather than labour costs), current income (rather than longer-term or life-time income), and cash incomes (rather than broader income concepts including benefits in-kind, etc.).

63. Indicators such as the METRs and NRRs presented here provide point estimates for one particular set of circumstances which makes it essential that sensitivity analyses be undertaken with respect to the assumptions underlying the calculations. Evaluating taxes and benefits for a wide range of earnings and household types goes some way towards such an assessment. However, while having results for different scenarios is a starting point, we would ideally want to know how important each of the scenarios is in a particular country in order to have a basis for choosing between them. This is particularly obvious if indicators are to be compared across countries.

64. Some of the relevant issues have been anticipated and are currently being investigated. These include the question of how relevant different types of social benefits are when considering individual household circumstances: how likely is it that individuals actually receive social benefits to which they are legally entitled? One specific facet of this issue concerns the receipt of different types of social benefits at the same time. For instance, unemployed individuals in low-income families may receive unemployment benefits and, at the same time, a low overall family income may make the family as a whole eligible for social assistance or minimum income benefits. While in some countries, the concurrent receipt of these two types of benefits is not legally possible, the situation is less clear in others and the most appropriate modelling assumption will therefore depend on how many cases of concurrent benefit receipt there are in practice.

65. Clearly, the decision whether to include minimum income schemes in the calculation can have a considerable impact on relevant indicators. This is particularly the case for countries operating relatively generous minimum income schemes. In the present paper, we have presented all indicators under the assumption that the unemployed person receives unemployment insurance benefits and, where legally possible, also minimum income benefits. However, all indicators have been computed under both assumptions (receiving and not receiving social assistance) and the "no Social Assistance" results are available on request.

66. Another issue that arises when comparing net household incomes across countries is the conceptual scope of the net income definition (as discussed in section II). Social transfers can take the form of direct cash payments to recipients. Alternatively, they can be delivered indirectly by intervening in the markets of goods and services likely to be consumed by intended recipients. Subsidised housing or childcare services are prime examples of the latter approach. In a similar way, taxes may directly reduce people's current incomes (income taxes or employees' social insurance contributions). But they may also alter the price structure in relevant markets affecting wages (taxes on employers including employer's social insurance contributions: see footnote 14) and the prices of goods and services (indirect taxes).

67. Tax/benefit models are primarily designed to capture the direct effects on current cash incomes. As such, they do not normally consider:

- benefits in-kind;
- the value of deferred benefits bought by current contributions to social insurance or compulsory private insurance schemes;
- differences of consumption possibilities due to indirect taxes;
- the effects on gross wages resulting from the imposition of taxes levied on the employer.

68. This focus is useful since direct cash payments made to households are of considerable interest. In comparing results across countries and over time, it is nevertheless important to keep in mind differences in the extent to which direct payments capture the functioning of taxes and benefits. While tax/benefit models based on typical households cannot fully capture these differences, it is possible to complement the main output of these models (current cash household income and its components) in order to illustrate the limitations of a strict focus on this income concept.

69. In the framework of the present EC-OECD project, work is currently being undertaken in four areas. First, insurance contributions paid by employers are now computed alongside current cash household incomes. Whilst these are not directly included in (most) of the indicators produced, they do provide important contextual background. Secondly, a detailed review of available evidence on benefit take-up analyses the extent and determinants of non-benefit take-up across countries. Thirdly, a study of coverage rates using both survey data and administrative sources aims to improve our understanding of who the benefit recipients are and how the combination of different benefits contributes to incomes of different types of household. Finally, efforts are underway to be able to compare household incomes after childcare costs have been deducted and respective subsidies taken into account. This is particularly relevant since childcare costs can use up a considerable part of family budgets and can therefore have important implications for parents' labour supply decisions. Since childcare is one area where institutional arrangements vary greatly across countries, it is not sufficient to only take into account childcare benefits paid directly to parents since subsidies to childcare institutions can have equally important effects on family budgets. To capture these factors, information on childcare costs has been collected and is currently being reviewed. A subsequent analysis of the implications for families' budgets of countries' childcare arrangements will build on this.

V. SUMMARY AND CONCLUSIONS

70. This paper has presented a cross-country comparison of three indicators of so-called unemployment, inactivity and low-wage traps for a set of hypothetical family types. Technically speaking, these are marginal effective tax rates (METRs) and constitute the main empirical results of the joint European Commission-OECD project allowing comparable tax-benefit calculations to be performed within a consistent conceptual framework.

71. These indicators provide a useful picture of the financial (dis)incentive to take up a job (unemployment/inactivity trap) or increase working time or work efforts when potential earnings are low (low-wage trap). Results have been presented for all current EU Member States along with a range of Candidate and non-EU countries. By taking into account the interactions between various components of each country's tax-benefit system, the calculations presented in this paper provide a detailed picture of the mechanics of tax-benefit systems. The plots of net incomes for different earnings levels (budget constraints) allow us to address issues of work incentives and benefit adequacy in a single framework.

72. The resulting METRs vary greatly across individual circumstances and family structures. The calculations presented in this paper show the extent to which features of the tax system and the possibility of receiving means-tested benefits can produce METRs that can be much higher at the bottom than the top end of the earnings distribution. This leads to situations where low-skilled individuals will frequently encounter unemployment, inactivity or low-wage traps.

73. The analysis shows that, as a result of the interaction of tax and benefit provisions, low-wage traps are most prevalent for households with overall gross earnings no more than 60-70% of APW earnings (which is often close to the minimum wage). They are particularly likely in countries where means-testing has traditionally played an important role in the benefit system.

74. For unemployment benefit recipients, we have seen that risks of unemployment traps are particularly high when potential re-entry wages are lower than before unemployment, often a result of the depreciation of marketable skills. In these cases there may be little, if any, immediate financial incentive to return to work. It is important to note, however, that the work incentive indicators presented in this paper are based on the presumption that the unemployed person actually has a choice. Strictly enforced job-search requirements can go some way towards reducing the possibility of job refusals. Also, while an important influence especially for low-income households, the immediate financial gain is likely not to be the only consideration when deciding whether to return to work or not. Nevertheless, unemployment traps are a distinct possibility which, along with benefit adequacy, needs to be taken into account when discussing benefit reforms.

75. As one would expect, the likelihood of inactivity traps for people receiving means-tested benefits is also highest for low-skilled workers with low earnings potential - possibly leading to continued benefit dependency and progressive marginalisation in the labour market.

76. Finding appropriate policy responses to address inactivity traps is, in many ways, more difficult than in the case of unemployment traps. The duration of unemployment insurance benefits is usually limited and benefits are more likely to be subject to stringent job-search conditions. While the institutional diversity is considerable, rules restricting benefit duration or eligibility tend to apply to a lesser extent to means-tested benefits of "last resort". At the same time, concerns with poverty levels make re-designing these benefit schemes more difficult. Job-search requirements and other conditions need to be more finely tuned than in the case of unemployment benefit recipients who have already, and recently, demonstrated

their ability to work. Careful analysis of budget constraints can, however, help to reduce any existing negative impact on work incentives. Introducing an earnings disregard allows maintaining some work attachment even for benefit recipients while in-work benefits can increase the attractiveness of taking up employment. In the case of non-working spouses, potential inactivity traps can be addressed by reducing the degree to which taxes paid by the working (or unemployed) spouse would be affected if the non-working spouse were to take up employment. Finally, integrating and co-ordinating the functioning of different parts of the tax-benefit system can prevent situations where taxes in combination with the withdrawal of a number of benefits generate METRs close to or in excess of 100%.

77. The results presented in this paper allow the identification of countries and family situations where individuals face hardly any short-term financial incentives to increase work efforts or to take up a job. Recent reforms to “make work pay” and to reduce the tax burden on labour, especially for low-wage earners, have contributed to lowering METRs faced by benefit recipients. This has reduced the risk of potential poverty and unemployment traps at certain income levels. Yet, despite such efforts there are still fundamental trade-offs in the ability of low income support programmes to be effective in relieving poverty and provide well-targeted benefits while maintaining desirable work incentives. The continued monitoring of the mechanics of tax-benefit systems can provide a useful contribution to finding suitably balanced solutions to this trade-off.

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