Making work pay

A conceptual paper

Research note 3/2016

Manos Matsaganis and
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Research note 3/2016

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Directorate-General for Employment, Social Affairs and Inclusion

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Abstract

Boosting the incomes of poor families while simultaneously enhancing the incentive to take up a job (if currently out of work), or to work longer hours (if currently employed part-time), is a key policy goal in Europe and beyond. This conceptual paper explains how work incentives may be measured, describes the main features of (and the issues raised by) in-work benefits, and outlines the potential contribution of the European tax-benefit model EUROMOD to further research on work incentives and in-work benefits in EU member states.

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Introduction

"Making work pay" became a policy concern in several countries (and, later, in the EU) as evidence began to accumulate that many Europeans were not (or, not significantly) better off working than living on benefits, at least in monetary terms[1]. As the 2003 Report[2] of the Employment Taskforce argued, "efforts must be pursued to ensure that working is always a more lucrative option than depending on benefits, i.e. 'make work pay'". This was clearly not the case at the time. Relatively high benefits when out of work, combined with low pay (net of taxes and social contributions) when in work, lowered the financial advantages of being employed. High child care costs acted as an additional barrier to female employment.

More than a decade later, there are reasons for concern with low work incentives and "making work pay". While the recession drastically affected labour market conditions in a number of member states, making low employment an issue of insufficient labour *demand* rather than supply, getting work incentives right remains important. After all, in spite of considerable interest (and some policy initiatives), in most European countries returns to employment seem to have hardly improved[3].

The policy (and political) constraints to "making work pay" are pretty obvious. Reducing levels of (or restricting access to) social benefits when not working is likely to be unpopular, may be seen as incompatible with the European social model, and would probably clash with anti-poverty objectives. Increasing earnings through minimum wage legislation is likely to be opposed by employers, and could cause some job loss[4]. Lowering taxes or social contributions for low earners is costly to the Exchequer, as is introducing or expanding in-work benefits to supplement low wages.

Notwithstanding these possible trade-offs, supporting the incomes of poor families while simultaneously enhancing the incentive to take up a job (if currently out of work), or to work longer hours (if currently employed part-time), remains a key policy goal in Europe and beyond. This conceptual paper aims to elucidate the issues involved. It does so by explaining how work incentives may be measured, by describing the main features of in-work benefits, and by outlining the potential contribution of the European tax-benefit model EUROMOD to further research on work incentives and in-work benefits in EU member states.

Work incentives

Benefits and taxes (including social contributions) interact in complex ways. This is especially the case when tax schedules are progressive (with tax rates gradually rising with income, see Box 1), and when social transfers are means tested (with the amount of benefit gradually reduced as a beneficiary's pre-transfer income rises, and fully withdrawn as soon as it reaches a certain threshold).

[1] Working clearly bestows more benefits to workers than as a mere source of earnings: it provides meaning, facilitates social interaction, boosts self-esteem. In this Research Note we focus on the monetary returns to employment.

[2] "Jobs, Jobs, Jobs: Creating more employment in Europe" (November 2003). Note that the Employment Taskforce was chaired by Wim Kok, who had been Prime Minister of the Netherlands (1994-2002) and trade union leader both at home (Chairman of NVV/NKV, 1973-1986) and in Europe (Chairman of ETUC, 1979-1982).

[3] See Immervoll (2016).

[4] The impact of the minimum wage on employment is a highly contested topic. Even though disagreements remain, the bulk of empirical studies show little or no job loss among adult workers following modest increases in the minimum wage, while employment effects are more pronounced among teenage workers. For a discussion, see Boeri and van Ours (2013, pp.45-51). See also Matsaganis et al. (2016, p.8).

Box 1 – Tax rates

Average tax rates (ATRs) show the total amount of tax due as a proportion of total income.

Marginal tax rates (MTRs) show the extra amount of tax due as a proportion of each €1 of extra income earned. In theory, progressive taxation merely requires that average tax rates rise with income. In practice, this is almost always achieved via rising marginal tax rates (applied at different income brackets).

Taxes and benefits, and their interactions, are likely seriously to affect labour supply decisions (see Box 2). Such responses manifest themselves not only in terms of whether to work or not (in the jargon of economists: *along the extensive margin*), but also in terms of how many hours to work if at all (i.e. along the *intensive* margin).

Box 2 – Work incentive indicators

Marginal effective tax rates (METRs) differ from conventional marginal tax rates in that the former also take into account reductions in entitlements to means-tested benefits as recipient incomes rise. METRs reflect the financial incentive for a working person to work longer or for a higher wage. A marginal effective tax rate of x% implies that, out of each additional €1 earned, x cents are lost in the form of additional taxes and social contributions paid, and of social benefits withdrawn[5].

Participation tax rates (PTRs), are conceptually very similar, indicating the effective tax rate on the extensive margin (i.e. concerning the decision to enter employment). Clearly, participation tax rates are complementary to marginal effective tax rates: the former are particularly useful when examining the incentive to take up a job (viewed from the perspective of e.g. a non-employed benefit recipient), while the latter are more appropriate when examining the incentive to work for a higher wage or longer hours (viewed from the perspective of e.g. a part-time employee)[6].

Replacement rates (RRs) show the level of out-of-work disposable income relative to in-work net earnings and other income. High replacement rates reflect a low financial incentive to become (or remain) employed[7].

[5] "[A marginal effective tax rate] in excess of 1 means that an individual would be worse off if they earned a bit more; a METR of 1 means that an individual would be unaffected by any small change in earnings; a METR of zero means that the individual is keeping all of any small rise in earnings". Note that it is possible for marginal effective tax rates to fall below 0: "[A] negative METR means that an individual's net income increases by more than a small change in earnings (this can arise where benefits act as a proportional subsidy on earnings, such as the phase-in portion of the earned income tax credit in the US)." (Brewer et al. 2010, pp.98-99). For an overview of marginal effective tax rates across Europe, see Jara and Tumino (2013), and Leventi and Vujackov (2016).

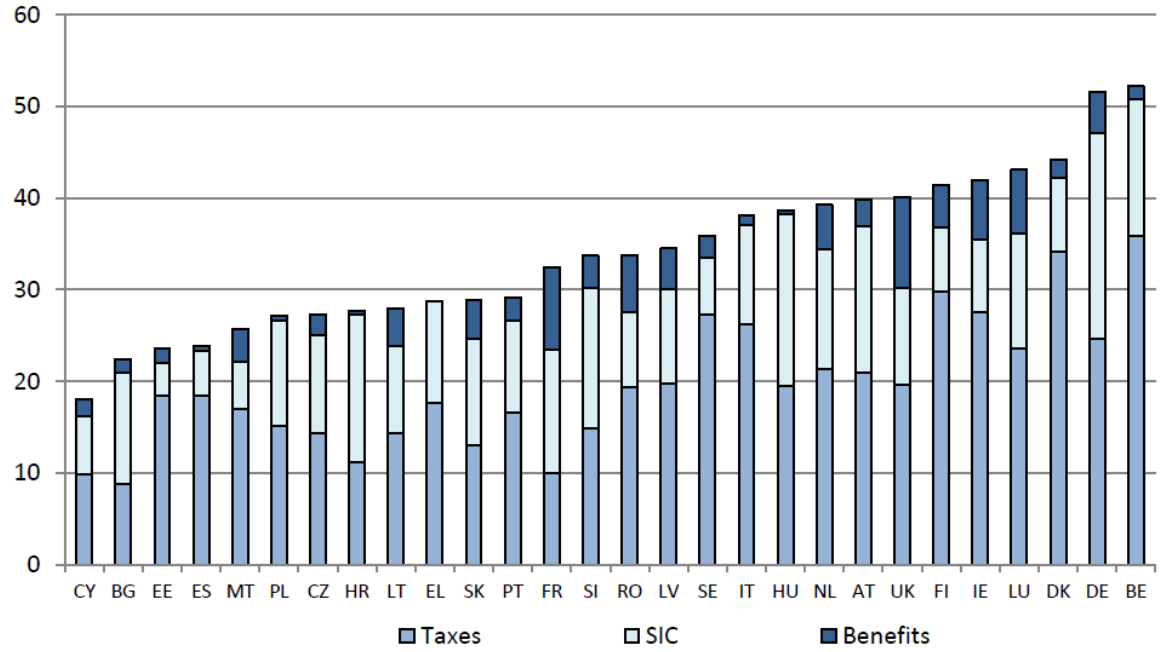
[6] "The participation tax rate (PTR) [...] measures how the tax and benefit system affects the financial gain to work. If someone who did not work had an income from a benefit programme of £60 a week, and would earn £250 in gross earnings, but pay £40 of that in income tax if they were to work, then the PTR is given by 1−((210−60)/250), or 40%. The higher the number, the more the tax and benefit system reduces the financial gain to work. A PTR in excess of 1 means the individual would be worse off in work than not working; a PTR equal to 1 means that there is no financial reward to work; a PTR of zero means that the financial reward to work is equal to gross earnings; negative PTRs are possible where benefits are conditional on being in work or having positive earnings." (Brewer et al. 2010, pp.97-98.) For an overview of work incentives at the extensive margin, see Immervoll and O'Donoghue (2004), and O'Donoghue (2011).

[7] Note that the bulk of empirical research in labour economics indicates that changes in benefit *duration* has a greater effect on the duration of unemployment spells than changes in benefit *generosity* (replacement rates). For a review, see Boeri and van Ours (2013, pp.322-333). Also, composition and entitlement effects are also likely to be present. For a discussion, see Immervoll (2012). In brief, the effects of benefit generosity or duration on aggregate unemployment may be smaller than their effects on the behaviour of individual benefit recipients. Also, a number of unemployed workers may not be covered by unemployment benefits. In Greece, in 2015, out of 1.27 million jobless workers, only 162 thousand (12.4%) received any of the three unemployment benefits available.

Although PTRs and RRs both describe work incentives on the extensive margin they have a different focus and characteristics[8]. For instance, if taxes and benefits were changed so that net income increased by the same *amount* in- and out-of-work (e.g. as with a lump-sum transfer), the replacement rate would increase while the participation rate would remain unchanged. This is because the tax burden on additional income would not change, though working would become less attractive in relative terms. On the other hand, if in- and out-of-work net income increased by the same *proportion*, RRs would remain constant, while this would not be the case with PTRs.

Work incentive indicators are likely to vary both within-country (e.g. by level of earnings and household type), and across-country. A recent study[9] reporting the latest estimates of METRs in all 28 member states provides evidence for both types of variation. As Figure 1 shows, most countries feature a mean METR between 30% and 40%. The exceptions are on the one hand Cyprus, Bulgaria, Estonia and Spain (mean METR below 25%), and on the other hand Belgium and Germany (mean METR in excess of 50%). Moreover, Figure 1 also shows that taxes are by far the most important determinant of METRs, followed by social contributions, while benefit withdrawal plays an important role in countries relying more on means-tested benefits (the UK, France, Luxembourg, Romania and Ireland).

Figure 1. Mean marginal effective tax rates (%) by income component, 2011



Note: METRs estimated for all individuals of working age (15-64) with positive earned income, taking account of the effect of earning 3% more such income (in gross terms) on their household disposable income. Source: Leventi and Vujackov (2016) based on EUROMOD G3.0+.

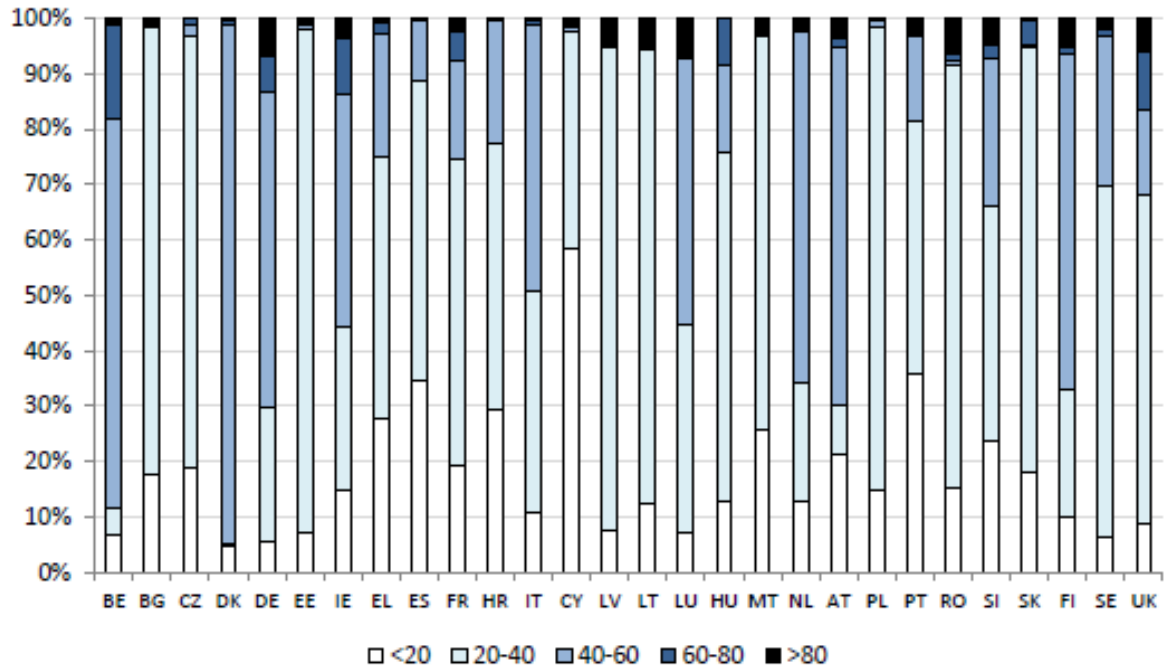
In terms of the within-country distribution, Figure 2 shows that in most countries most workers face METRs below 40% (or, as in Cyprus, Spain and Portugal, below 20%). At the other extreme, in certain countries (Belgium, Denmark, Germany, Ireland, Italy, Luxembourg, Netherlands, Austria, Finland) higher rates are the norm. Furthermore, almost all member states contain a minority of workers facing very high rates (over 80%), typically as a result of the interaction of high tax and contribution rates with

[8] For a discussion, see Adam et al. (2006).

[9] See Leventi and Vujackov (2016).

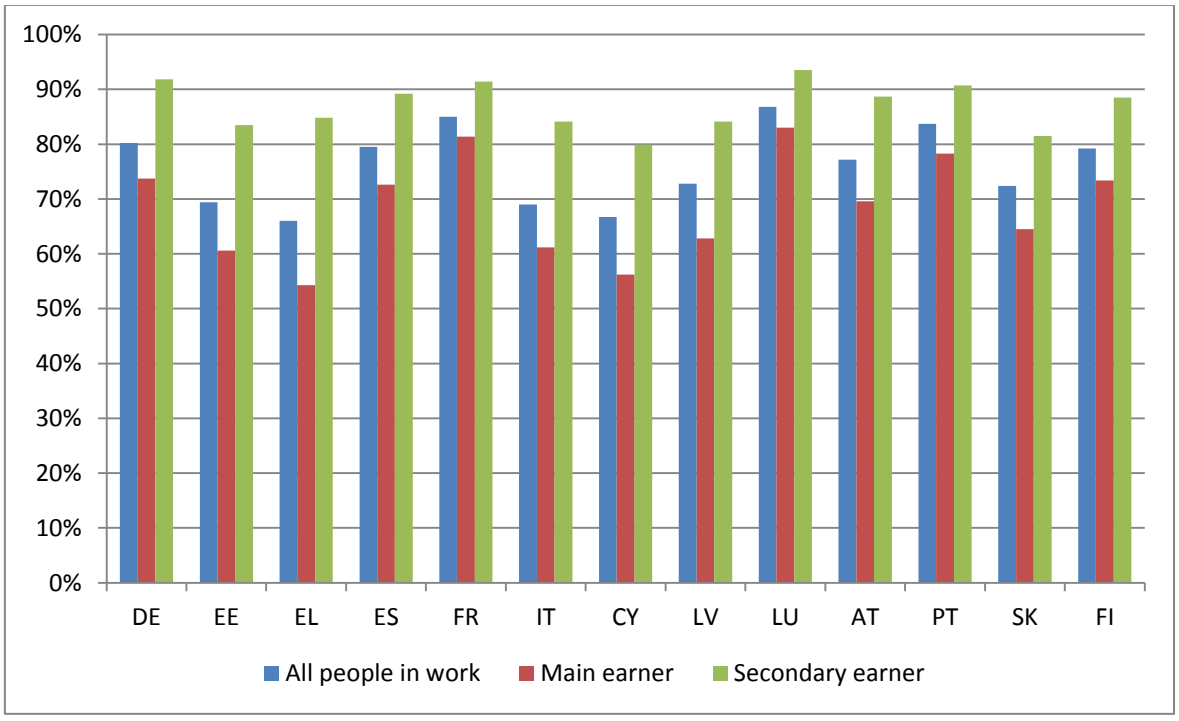
steep benefit withdrawal schedules, or because of discontinuities in entitlement to social benefits or tax allowances.

Figure 2. Share of workers (%) by range of marginal effective tax rates, 2011



Source: Leventi and Vujackov (2016) based on EUROMOD G3.0+.

Figure 3. Mean net replacement rates for main and secondary earners, 2012



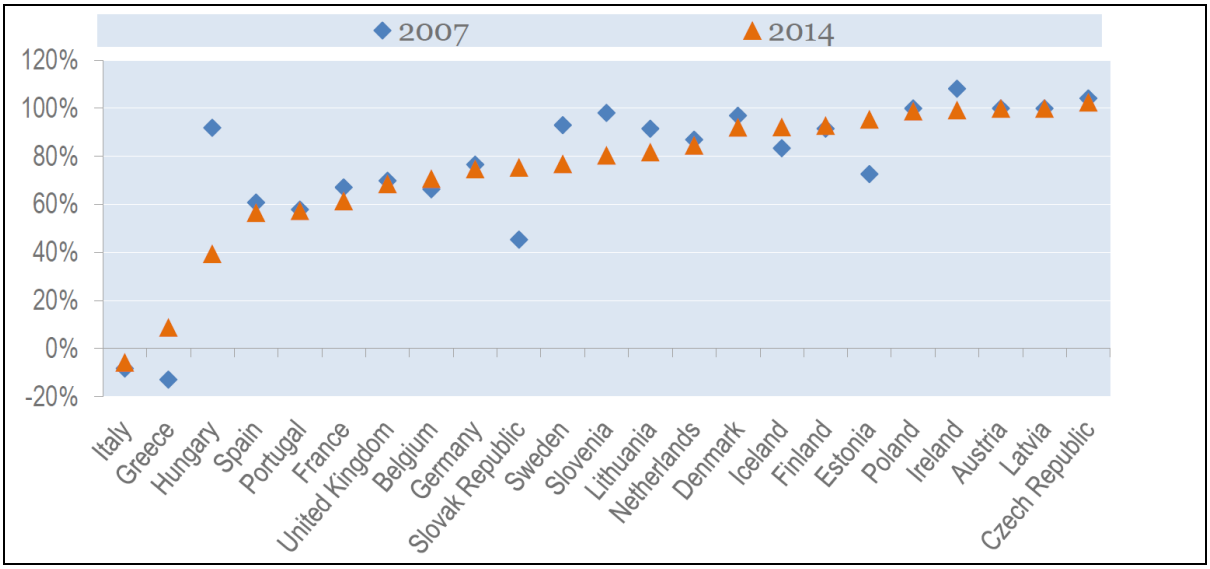
Note: Unemployment insurance and social assistance schemes taken into consideration in the calculation of net replacement rates according to the entitlement rules in place in each country.

Source: Adapted from Figure 8 in Jara et al. (2015) based on EUROMOD G2.14.

Another recent study[10] provides estimates of mean net replacement rates (calculated as the ratio of household disposable income after relative to before job loss, for all people currently in work, in case of an unemployment spell) in thirteen EMU member states[11]. As Figure 3 shows, the relevant figures range from 66% in Greece to 87% in Luxembourg. Mean net replacement rates are driven by the rules and characteristics of unemployment insurance and social assistance schemes in each country, and are influenced by the distribution of other household incomes. The important role of other household incomes emerges clearly when comparing the net replacement rates of secondary earners relative to those of main earners: in the former case, the loss of *individual* earnings as a result of job loss accounts for a smaller decline in *household* disposable income.

Finally, new evidence on the distribution of participation tax rates in most EU member states, estimated for individuals moving from minimum income (not unemployment) benefit to full-time employment, using the OECD tax-benefit model, was provided in a recent presentation[12]. As Figure 4 shows, except in countries like Italy and Greece (where no minimum income scheme exists as yet) and Hungary (where such schemes are local and often discretionary), PTRs remain in fact high. The proportion of earnings paid out in taxes and social contributions, and/or in terms of benefit lost, was in 2014 around 60% in Spain, Portugal and France, between 60% and 80% in the UK, Germany, the Slovak Republic and Sweden, over 80% Slovenia, Lithuania, the Netherlands, Denmark, Finland and Estonia (and Iceland), and around 100% in Poland, Ireland, Austria, Latvia and the Czech Republic. Moreover, with the exception of Hungary, Sweden, Slovenia Lithuania and Ireland, where PTRs had fallen, and Greece, the Slovak Republic and Estonia (and Iceland), where PTRs had increased, in most countries there was little or no change relative to 2007.

Figure 4. Participation tax rates when moving from minimum income benefits to full-time employment, 2007 vs. 2014



Source: Immervoll (2016) based on OECD tax-benefit model.

Moving from work incentive indicators to labour supply behaviour, exactly how much the former affects the latter is a key empirical question of labour economics and public finance[13]. In general, as shown in Box 3, workers' behavioural responses are

[10] See Jara et al. (2015).

[11] The countries included in the analysis are Germany, Estonia, Greece, Spain, France, Italy, Cyprus, Latvia, Luxembourg, Austria, Portugal, Slovakia and Finland.

[12] See the presentation by Immervoll (2016).

[13] "The key issue is how effort reacts to incentives. However, effort can be adjusted on many different margins: people can change their hours of work per week or per year, whether they work at all or not and the amount of effort they put into working" (Meghir and Phillips 2010, p.205).

measured by the elasticity of labour supply with respect to wages, ultimately assessed by workers in net terms (i.e. post-tax and post-benefit).

Box 3 – Labour supply elasticities

In principle, labour supply elasticities can be estimated for different groups of workers, and may be defined in terms of either work participation (i.e. at the extensive margin), or hours worked (i.e. at the intensive margin), or taxable income.

The participation elasticity shows the proportional change in the number of employed workers (belonging to the target group) following a proportional change in net wages[14].

The elasticity of hours of work with respect to net wages is calculated as the proportional change in hours of work following a proportional change in net wages. For instance, a labour supply elasticity of 0.8 implies that a 10% increase in the wage would lead to an 8% increase in hours. Suppose that a worker is facing a 20% tax rate and that her wage elasticity is 0.8. Suppose also that the tax rate is raised to 22%, which is equivalent to a 2.5% reduction in net wages (i.e. from 80 to 78 cents per €1 earned). An elasticity of 0.8 would imply a 2% reduction in hours worked (2.5% × 0.8 = 2%). If the worker in our example used to work 150 hours a month before the tax increase, she would now supply 3 hours of work less, that is 147 hours per month[15].

The elasticity of taxable income has also attracted interest. This is because some workers, in order to adjust their tax liability, may change the way they earn income from different sources, or the way they *report* incomes earned to the tax authority[16].

On the whole, labour supply elasticities differ by gender, marital status, education, earnings, and household income[17]. The consensus among economists is that the labour supply of male full-time workers is fairly inelastic to changes in taxes (and benefits), while that of married women and lone mothers (and some other groups) is typically more responsive to such changes[18]. Moreover, elasticities at the extensive margin are generally larger than elasticities at the intensive margin[19].

In recent decades, in order to improve work incentives, tax reforms in many countries have reduced marginal tax rates, especially at the top of the income distribution. At the same time, benefit reforms have also reduced marginal effective tax rates at the bottom of the income distribution. Nevertheless, the latter tend to remain higher than

[14] Note that 'work participation' here means that the person concerned is actually employed. This is not to be confused with 'labour market participation', referring to the share of the labour force in either employment or unemployment (i.e. not in inactivity).

[15] Adapted from Meghir and Phillips (2010, p.205).

[16] For a review of the 'New Tax Responsiveness' literature, see Meghir and Phillips 2010 (theory: pp.221-225; empirical results: pp.238-241).

[17] "[T]he labor supply of a regular full-time worker is probably inelastic to tax changes. [But there are] four groups of workers whose behaviour may be affected by high tax rates: those with high-income work, those with low-income work who are eligible for in-work benefits, those nearing retirement, and those considering entering the labor force. At the upper end of the wage distribution, high marginal tax rates may reduce labour supply and work effort. At the low end of the income distribution, means-tested benefits discourage workers from participating in the labour market." See Boeri and van Ours (2013, p.387), reviewing Disney (2000).

[18] "The review of the literature yields a very interesting picture. Incentives certainly matter, but the relevant margin differs by demographic and education group. For some groups, such as women with young children, taxes and benefits can affect whether to work or not as well as how many hours they work. For low education men, tax and benefit incentives are also important, but only for the participation decision; their hours of work are insensitive to changes in taxes and benefits. These men either do not work at all (and up to 25% do not) or work full time—this margin is quite sensitive to how the tax and benefit system is structured." See Meghir and Phillips (2010, p.204/206).

[19] See Bargain et al. (2014).

the former, overwhelmingly so for workers living in low-income households[20]. Moreover, as Figure 4 above indicates, in most countries the work incentives of social assistance recipients do not seem to have improved much in recent years.

At the extreme, the incentive to work will be zero when low-income individuals are better off on benefits than in work (in terms of net income, post-tax and post-transfer). This is seen in Box 4.

Box 4 – Perverse incentives

When the returns to work relative to not working (and living on benefits) are low, poverty or unemployment or inactivity traps will arise.

Unemployment traps refer to situations when unemployment benefits are so high relative to net incomes from work, that recipients prefer to put less effort into (or not to engage at all in) job search. *Inactivity traps* are instead present when the person deciding not to work would not be eligible for unemployment benefit[21].

Poverty traps are a more general case. In the early literature, such traps were often defined as marginal effective tax rates in excess of 100%[22]. In fact, poverty traps may be more widespread than the early literature implied. Labour incentives will be drastically weakened when 'work does not pay' *enough*. In other words, low-income individuals may well have slightly higher overall incomes if they take up a low-paying job, compared to simply living on benefits (evidence of marginal effective tax rates below 100%), but may still be worse off in terms of disposable income *net of essential expenses*, let alone in terms of welfare (in the sense of *subjective well-being*).

The paradox of the poverty trap is that benefit receipt ensures that acute hardship is averted. Nevertheless, steep rates of benefit withdrawal as pre-transfer incomes rise (especially when combined with taxes and/or contributions on earned income from the first €1) eliminate the incentive to work, practically trapping recipients to welfare dependency (and a standard of living barely above social minima).

This is better understood taking the example of a lone mother: since by taking up paid employment, in addition to (i) having part or all of her benefit withdrawn, and (ii) starting to pay taxes and contributions on her earnings, she also has to pay for (iii) work-related expenses (e.g. transport, smarter clothes), and (iv) childcare when at work, she may well come to the conclusion that 'work does not pay' – even when marginal effective tax rates are kept below 100%[23]. Bringing in the fact that she (and society) may attach a high value to time spent looking after her child rather than working, the decision not to work becomes perfectly legitimate.

Basic income, paid unconditionally to all members of a certain community irrespective of income or work status, would be a radical solution to the poverty trap, as it would provide an income floor to all, while at the same time reducing benefit withdrawal rates to zero. That would certainly improve incentives at the bottom of the income distribution, encouraging poor individuals to engage in paid work[24]. On the other hand,

[20] Even in the UK, where particular care has been taken to make sure that individuals are better off in work than on benefits, marginal effective tax rates are often perilously close to (albeit no longer over) 100%. As a comprehensive review explained: "The amount of gross income taken in tax and withdrawn benefits when people enter work at low earnings is too high: for most groups it is close to 100% before individuals are entitled to the working tax credit, and they remain high even with it. [...] The marginal rate of 73.4% that many low to moderate earners face when having tax credits withdrawn is likely to be above the optimal rate even if people's decision to work a little harder is relatively unresponsive." (Brewer et al. 2010, p.92.)

[21] For an analysis, see OECD (2005, p.129).

[22] See Barr and Hall (1975, p.373), where the actual term used is "implicit marginal tax rates".

[23] Recall that in the debates of the 1970s and 1980s, the case for cutting top marginal tax rates for high earners to below 50% in most EU countries (below 40% in the US) rested on the apparent desire to preserve work incentives.

[24] Note that while a basic income would certainly lower METRs at the bottom, it might also lead some simply to withdraw from the labour force and live on the basic income alone. In economics jargon, that would

the fiscal cost of a universal income allowance would imply higher taxes on everybody else, which in turn might affect work incentives further up the earnings distribution.

On the whole, eliminating poverty and inactivity traps by reducing benefit withdrawal rates is costly: it leads to more benefit being paid to more recipients. In this sense, a stark trade-off operates between two widely shared aims of policy: on the one hand, the need to limit fiscal costs; on the other hand, the wish to improve work incentives.

More generally, the returns to work can be improved either by reducing social minima (i.e. incomes when not working, such as unemployment benefits and/or social assistance) while keeping net earnings constant, or by improving net incomes (i.e. post-tax and post-transfer) when working while keeping social minima constant (or by combining both).

There are good reasons to assume that reducing social minima is undesirable. As discussed earlier, restricting access to social benefits when not working, or reducing their levels, is not only likely to be unpopular, and be seen as incompatible with the 'European social model', but also to clash with anti-poverty objectives. Note that, in recent years, poverty rates among employed workers have gone up slightly (from 8.5% in 2008 to 9.6% in 2014), whereas they are higher and have risen by more among the non-employed (from 26.2% to 30.5% over the same period). Moreover, poverty rates among the unemployed remain very high (47.5% in 2014, up from 45.1% in 2008)[25]. Improving work incentives may well facilitate the move from non-employment into employment, but many individuals will be unable to respond to such incentives – all the more so at a time of sluggish growth and labour demand. As a consequence, adequate income support (including to those out of work) remains a key component of fighting poverty in Europe.

In view of the above, making work pay can only be promoted by a combination of wage subsidies, higher minimum wages[26], lower taxes and social contributions, as well as in-work benefits that can be claimed even when recipients are in employment. The next section focuses on the latter.

In-work benefits

In principle, even 'traditional' social benefits may contain features that allow recipients to continue to claim them legitimately after they have taken up a job. For instance, a fixed amount (e.g. the first €50 a month) and/or a proportion (e.g. 20%) of earnings may be *disregarded* when income is assessed by the benefit agency to determine entitlement for benefit. *Fixed-period awards*, when benefits are approved for e.g. one year, during which time recipients are not required to inform the benefit agency of changes in family income, also serve to mitigate poverty and unemployment traps[27].

Nonetheless, in-work benefits are commonly understood as cash transfers[28] *conditional on employment*. In other words, often the focus is on income-support

happen if income effects (i.e. the availability of basic income encouraging individuals to work less) were to dominate substitution effects (i.e. low METRs encouraging individuals to work more). A recent study of the Belgian 'Win for Life' lottery, where winners receive a (basic income-like) lifelong income, rather than a one-off payment as in most lotteries, provided some evidence on the extent to which this is likely to be the case. The results pointed to no extreme consequences of basic income on labour supply, with very few winners quitting work, working less or becoming self-employed. See Marx and Peeters (2008).

[25] All figures from the Eurostat database, for the EU27.

[26] For an analysis of how income packages at the low end of the income distribution have evolved in recent decades in various European countries, see Cantillon et al (2015). For a discussion of minimum wages, and an estimation of their effects on poverty in the EU, see Matsaganis et al. (2016).

[27] For an analysis, see Barr (2012, p. 202).

[28] Note, however, that in-kind benefits, such as child care reserved for female workers (i.e. not available to non-employed mothers), may also be relevant in some countries and/or for some categories of workers.

programmes specifically reserved for those facing *in-work* poverty, i.e. *working* persons in low-income families[29].

The emblematic example of such programmes, operating through the tax system, is the *Earned Income Tax Credit* (EITC)[30], introduced in the US in 1975. However, EITC was actually predated by *Family Income Supplement*, a means-tested benefit for working people with children legislated in the UK in 1970 (effective from 1971), which was replaced by *Family Credit* in 1986, which was itself significantly extended by *Working Family Tax Credit* (WFTC)[31] introduced in 1999. In 2017, *Working Tax Credit* (WTC), as currently known, together with another five schemes[32], is expected to be fused into *Universal Credit* (introduced in 2013)[33]. The way EITC and WTC operate is briefly described in Box 5.

Box 5 – In-work benefits in practice

Earned Income Tax Credit (EITC) was originally designed as a rather modest programme, aimed at offsetting the social security payroll tax for low-income families with children, its generosity was subsequently increased in the tax acts of 1986, 1990, and 1993. As a result, EITC has emerged as the most substantial income-support programme in the US. In contrast, the scope of *Working Tax Credit* (WTC) was more ambitious from its introduction as *Working Family Tax Credit* (WFTC).

EITC and WTC are calculated as a subsidy to earnings over a range of gross income (not counting the subsidy itself). The two programmes share key features, including a maximum amount of subsidy and a generous taper or phase-out (i.e. withdrawal) rate. The maximum level of tax credit is higher for married couples than for single persons, and increases with the number of children.

The main difference between the two programmes is that in the case of EITC the value of the subsidy at first increases until it reaches a maximum, then is gradually withdrawn. The phase-in rate varies by marital status and the number of children (like the phase-out rate and the maximum amount of tax credit). Specifically, in the tax year 2015, a couple with two children would have their annual earned income subsidized at a phase-in rate of 40% until it reached $13,870, at which point the amount of tax credit would be maximised at $5,548 pa (13,870 × 0.4 = 5,548). It would then remain constant until annual earned income reached $18,110; beyond that level, the amount of tax credit would be reduced at a phase-out rate of 21.06%. EITC would be fully withdrawn as soon as annual earned income exceeded $44,454 pa. For the 2014 tax year, 27.5 million taxpayers (about 22% of all taxpayers of working age) received about $66.7 billion in EITC[34].

In contrast, WTC pays a fixed amount from the first £1 of annual income, until it reaches a certain level. Roughly equivalent to the phase-in rate in EITC, the amount of tax credit under WTC is higher for those working 30 or more hours a week (up to £810 a year on top of the basic amount of £1,960 a year). The maximum amount of tax credit varies by marital status and the number of children (and child care costs, also subject to a maximum). Beyond that level, WTC is withdrawn at a fixed rate. The amount of tax credit payable is significantly more generous in WTC than in EITC, and

[29] For an excellent and comprehensive (albeit no longer up-to-date) review, see Immervoll and Pearson (2009), who analysed the main issues and described in detail the various schemes then in operation in the 16 of the 30 OECD countries with employment-conditional schemes of one form or another (p.18).

[30] For a description, see OECD (2005, p.151). Information on current programme rules and parameter values can be found in IRS (2016). For a discussion, see Wicks-Lim and Pollin (2012).

[31] For a description, see Stuart et al. (2010, pp.60-61). Information on WTC can be found in the official site of the UK government (see WTC entitlement table updated 6 April 2016).

[32] These are: Child Tax Credit, Jobseeker's Allowance, Housing Benefit, Employment and Support Allowance, and Income Support.

[33] For a recent analysis of the effects of Universal Credit on the work incentives of single parents, see Brewer and De Agostini (2015).

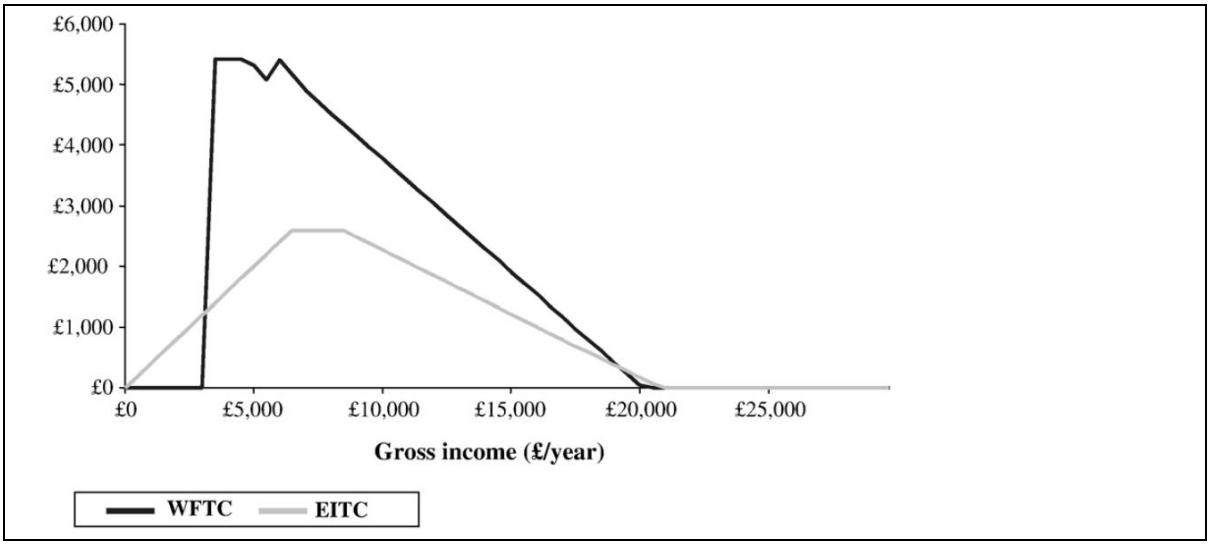
[34] Source: Internal Revenue Service (see https://www.eitc.irs.gov/EITC-Central/eitcstats).

the withdrawal rate is twice as steep. As a matter of fact, in the tax year 2016-2017, a working couple with two children and child care costs of £300 per week (i.e. the maximum allowed) would receive tax credit worth £21,000 per year for a joint annual income (pre-WTC) of up to £8,400. Beyond that level, the amount of tax credit would be reduced at a withdrawal rate of 41%. WTC would be fully withdrawn when annual income reached £59,620 pa. In the 2013-14 tax year, 2.5 million working age families (about 13% of all) received WTC[35].

Similar though distinctly less ambitious schemes, including targeted reductions of income taxes or social contributions, as in Germany and Finland, and bonus payments when moving into employment ('into work benefits'), as in Austria and the Slovak Republic, are available in several other EU member states and elsewhere[36].

A graphical illustration of the structure of the US and UK schemes is provided in Figure 5 below.

Figure 5. Amount of tax credit available under EITC vs. WFTC, 2003



Source: Blundell (2006).

Comparisons of the archetypal US and the UK tax credits pointed out to a puzzle: WFTC was about twice as generous as EITC, but with half the impact in terms of boosting employment. Interactions with the rest of the tax-benefit system provide some clues to resolving that puzzle. In the US, while the welfare reform of the 1990s limited the scope for cash benefits to the poor, EITC continued to expand, eclipsing what was made available under Temporary Assistance for Needy Families (TANF). In contrast, poor families with children in the UK could also rely on universal Child Benefit, means-tested Income Support and Housing Benefit, and non-refundable income tax allowance, some of which had been improved at about the same time as WFTC was introduced. As a result, poverty relief was more successful in the UK, but labour supply responses more marked in the US[37].

When income is tested for eligibility at household level, the redistributive effects of in-work benefits (i.e. in terms of reducing in-work poverty) are clear. In contrast, their employment effects are more ambiguous. In-work benefits strengthen the incentive of workers in jobless households to enter employment (along the extensive margin) by reducing participation tax rates and increasing the returns to work. Nevertheless, if eligibility for in-work benefits depends on low *family* income, potential second earners

[35] Source: Institute of Fiscal Studies (see http://www.ifs.org.uk/tools_and_resources/fiscal_facts/).

[36] See Immervoll and Pearson (2009, pp.20-25).

[37] For a comparative analysis of EITC and WFTC, and a detailed review of the early evidence on their effects, see Blundell (2006).

may face significant disincentives to enter employment, as participation tax rates over the relevant range may be prohibitively high. On the other hand, EITC-type schemes strengthen the incentive of all earners in the household to work longer (along the intensive margin) by providing for *negative* marginal effective tax rates, up to the level of earned income at which the amount of tax credit stabilizes. Subsequently, past the level the tax credit begins to be gradually withdrawn, marginal effective tax rates are positive, introducing some disincentive to work more hours. However, often that disincentive is not as strong as in more traditional welfare programmes, typically featuring steeper marginal effective tax rates[38]. Furthermore, there is evidence that in many cases the positive effects of in-work benefits in terms of additional employment outweigh the negative effects of reduced incentives to work more hours[39].

As the above discussion illustrates, there is some tension between work incentives and redistributive goals, as well as between work incentives at the intensive vs. extensive margins. Family-based in-work benefit programmes are most effective as tools to fight poverty where employment is already high but earnings insufficient to lift individuals and families over the poverty line. Such programmes have the additional advantage of having relatively limited fiscal implications. On the other hand, family-based in-work benefits introduce high participation tax rates for potential second earners in currently one-earner households, over a certain range of household income.

On the contrary, individual-based in-work benefit programmes, where income is tested for eligibility at individual not household level, ensure lower participation tax rates and hence better work incentives (at the extensive margin) for all earners. However, this is likely to come at the expense of higher budgetary costs, as well as poorer targeting (as low earners in non-poor households may become eligible for benefit).

In other words, because in-work benefits are most typically targeted to families, and hence means-tested at household level, they may actually weaken work incentives for other family members, by moving households to regions of the budget set with high marginal tax rates. This will especially be the case when work incentives for secondary earners are already weak (e.g. because of family-based tax systems or expensive childcare), or where employment rates are low for secondary earners[40].

One response to that, tried in countries like Belgium, Finland, Hungary, Sweden, and the Netherlands, is to have *individual-based* in-work benefits (means-tested against *individual* income). This, however, weakens redistributive objectives, as would lead to in-work benefits also being paid to low earners in higher-income households. To deal with the trade-off between these two competitive objectives, some have proposed a "benefit premium for two-earner households"[41], or a "double earner premium"[42].

The above point illustrates how interactions with minimum wages can also be crucial. Since workers on minimum wages may in fact live in higher-income families, in-work benefits are generally considered to be more effective as tools for redistribution and poverty reduction. Nevertheless, establishing a wage floor remains essential for the good performance of in-work benefits, as the former limits the extent to which the latter can be captured by employers rather than by workers in low-income families. On the other hand, raising the minimum wage above a certain level can be counter-productive, as it would compress the wage distribution and hence limit the scope for in-work benefits.

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[38] For instance, in 2015-2016 families on Income Support and income-based Jobseeker's Allowance in the UK faced a marginal effective tax rate of 100%, after a small earnings disregard (£5 a week for single adults, £10 a week for couples, £20 a week for lone parents). By comparison, the rate at which Working Tax Credit is withdrawn was 41%.

[39] See Immervoll and Pearson (2009, p.6).

[40] See Immervoll and Pearson (2009, pp.8-9).

[41] See De Luca et al (2014).

[42] See Kurowska et al (2015).

On the whole, in-work benefits are appealing (and have become popular among policy makers) because they seem to hold the promise of being effective in boosting low incomes, while simultaneously enhancing the incentive to take up a job. Even though this promise has really come true in several countries, in-work benefits cannot by themselves 'solve' the financial and employment problems of low-skilled workers. At worst, they may function as a subsidy to employers paying low wages. At best, they can be a useful complement to public policies investing in skills and easing the transition from education to employment (and from welfare to work)[43].

Moreover, the success of in-work benefits is not easy to replicate across policy settings, as their effectiveness (and cost) will hinge on a variety of factors[44]. For instance, in-work benefit programmes will be costlier and/or less effective where (i) the tax burden on low earners is high, (ii) the earnings distribution is relatively compressed, and (iii) second-earner employment rates are low.

In line with this reasoning, Table 1 reports (i) the average tax rate faced by low earners, defined as workers earning less than two thirds of median earnings, (ii) a measure of earnings dispersion, calculated as the ratio of bottom-decile-to-median hourly earnings, and (iii) the employment rate of spouses or partners of the reference person in the household.

As seen in Table 1, average tax rates range from virtually 0% in the UK (due to a low standard rate of income tax, a generous personal allowance, and the availability of working tax credit) to over 20% in certain Central and East European member states (Hungary, Romania, Poland, Croatia and Slovenia).

Our indicator of earnings dispersion ranges from around 50% in Estonia, Germany, Ireland and Poland to more than 75% in Sweden. (Recall that a low ratio implies more earnings inequality at the low end of the distribution.)

As for the employment rate of secondary earners, approximated here by spouses and partners, it is lowest in Greece and Malta (around 46-47%), followed by Italy (52%) and Croatia (58%), while it exceeds 75% in the Netherlands, Luxembourg, and the three Baltic Republics (Lithuania, Latvia, Estonia).

Can member states be clustered in distinct groups according to the scope for in-work benefits given their performance along the three indicators of Table 1?

Even if trade-offs between redistributive goals and work incentives could be discounted, doing so would require prior knowledge of how the value of each indicator is transformed to a metric of effectiveness of in-work benefits, and a judgement on the relative weight of each indicator vis-à-vis the other two. Since none of the above is possible, all we can do is rank countries according to where they are located relative to the EU average vis-à-vis each of the indicators mentioned above.

Assuming that the policy goals are to reduce in-work poverty and improve work incentives for jobless households (rather than e.g. raise female employment rates), we can assess the relative position of each member state with respect to the EU average. This is attempted in Figure 6, where countries are grouped according to whether they score above or below the EU average on each of the three indicators.

Based on our *a priori* notion, as explained above, of the potential scope for introducing or expanding family-based in-work benefit programmes aimed to combat in-work poverty and to get members of jobless households to work, we would expect that in-work benefits will be more effective and less costly in countries where (i) average tax rates for low earners are *lower*, (ii) earnings dispersion is *higher*, and (iii) spouse or partner employment is *higher* than the EU28 average.

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[43] For example, a cross-country study found that single women in Hungary and Poland were far less responsive to the financial incentives inherent in in-work benefits than single women in Ireland and the United Kingdom. See Bargain et al (2014).

[44] As pointed out by Immervoll and Pearson (2009, p.8). We thank one of the authors of that work (Immervoll) for a useful discussion on this point.

Table 1. Conditions influencing scope for in-work benefits, 2014

	Average tax rate, low earners, %	Low-to-median earnings ratio, %	Employment rate, spouses or partners, %
Belgium	13.9	73.7	60.7
Bulgaria	11.2	59.9	66.1
Czech Republic	14.1	55.5	67.4
Denmark	12.9	67.4	69.8
Germany	13.0	52.2	74.1
Estonia	11.1	50.9	79.4
Ireland	6.3	52.7	74.7
Greece	13.6	64.1	45.9
Spain	13.5	62.2	61.6
France	17.0	67.1	68.4
Croatia	20.6	54.5	57.8
Italy	13.9	67.5	52.0
Cyprus	5.7	56.2	62.4
Latvia	14.7	57.6	78.4
Lithuania	8.6	54.7	77.3
Luxembourg	13.8	63.9	78.1
Hungary	25.0	61.3	61.8
Malta	11.0	63.0	47.1
Netherlands	17.1	57.8	78.8
Austria	4.3	60.3	67.8
Poland	20.8	52.4	60.6
Portugal	9.7	62.3	67.6
Romania	21.5	54.2	60.4
Slovenia	20.5	60.8	73.3
Slovakia	9.8	56.1	61.4
Finland	10.2	71.6	68.0
Sweden	7.9	76.2	73.1
UK	0.0	57.9	71.9
EU28	12.9	60.5	65.7

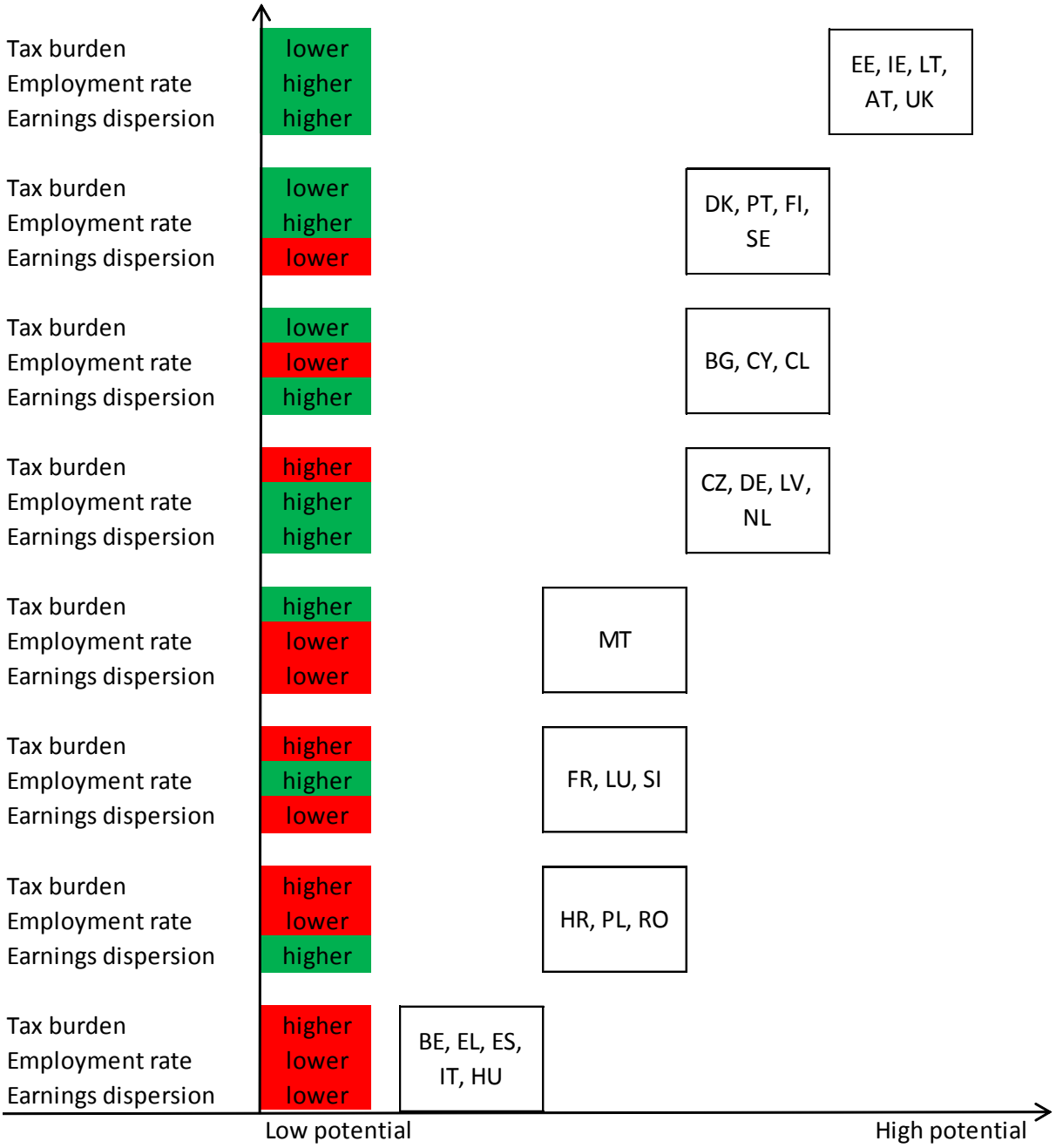
Note: The average tax rate for low earners is calculated as the sum of personal income tax and social insurance contributions as a proportion of gross income for dependent workers with non-zero earnings below 66.67% of median earnings and no market income from other sources. The low-to-median earnings ratio is the hourly earnings of the bottom decile as a proportion of median hourly earnings, for all dependent workers except those in public administration, defence and social security (NACE O); figures for Greece, Croatia and Portugal are for 2010. Employment rates refer to persons aged 15-64 identified as the spouse or partner of the reference person in the household; missing data for Denmark, Finland and Sweden replaced by the female employment rate (15-64 years). The EU28 figure is unweighted average in the case of average tax rates and low-to-median earnings ratio, and a composite index (weighted average) in the case of the employment rate of partners or spouses.

Sources: EUROMOD (average tax rate), Structure of Earnings Survey (low-to-median earnings ratio), EU-LFS (employment rate of spouses or partners).

As seen in Figure 6, Estonia, Ireland, Lithuania, Austria and the UK feature a relatively light tax burden for those with low earnings, a higher spouse or partner employment rate, and higher earnings dispersion, implying a relatively high potential scope for introducing new in-work benefits or expanding those already available. Of course, countries where in-work benefits have been in operation for some time, such the UK and Ireland, may owe their position to these very programmes. For instance, the Working Tax Credit in the UK may have helped to raise employment rates for secondary earners, while at the same lowering average tax rates for recipients. At the

other extreme, a relative high tax burden, a low spouse/partner employment rate and low earnings dispersion, as observed in Belgium, Greece, Spain, Italy and Hungary, seem to limit the potential scope for family based in-work benefits in these countries.

Figure 6. Potential scope for in-work benefits



Notes: 'Lower' ('higher') refers to each country's score on the relevant indicator being below (above) the EU average. Red (green) colour indicates a relatively low (high) potential scope for introducing or expanding family-based in-work benefits in each country according to the relevant indicator. 'Tax burden' is the average tax rate of low earners; 'employment rate' is that of spouses or partners; 'earnings dispersion' is the low-to-median earnings ratio. See notes to Table 1.

Towards a research plan

A proper analysis of the work incentives embedded in each national tax-benefit system requires taking fully into account the interactions between the gross earning distribution, the socio-demographic characteristics of the population and the tax-benefit rules. A microsimulation approach is well suited to performing such analysis as it provides the basis for an ex-ante careful and evidence-based evaluation of the design of tax-benefit reforms. Although the policy evaluation literature has focused

more on *ex-post* analysis, some writers[45] have underlined the need to consider both ex-ante and ex-post approaches to study the effects of policy changes. Although ex-post analysis is typically conducted by means of randomised controlled trials and quasi-experimental approaches, based on difference-in-difference, matching and selection estimators, the recent cross-fertilisation between ex-ante and ex-post approaches has contributed to the increasing credibility of analysis based on detailed microsimulation models, making them a core part of the causal policy evaluation literature[46].

EUROMOD, the EU-wide tax benefit model, can be used to assess the redistributive and work incentive effects of in-work benefits for all EU countries based on micro data representative of the national population or on synthetic family types defined by the user with a great level of flexibility. The latest public release of the model (February 2016) covers all 28 EU Member States and policies up to 2015 (or, for a minority of countries, 2014) based on EU-SILC 2012 data (2011 income)[47].

In principle, the full range of work incentive indicators discussed earlier (i.e. marginal effective tax rates, participation tax rates, and replacement rates) can be estimated using EUROMOD[48].

While METRs, PTRs and RRs are used to measure work incentives for a particular individual by changing individual gross earnings (and labour market status), the effect on disposable income is usually considered at the household level as this is often the more relevant unit of assessment for benefits and unit of aggregation when measuring living standards[49].

METRs are usually calculated for each working age individual with earnings in the household in turn, taking into account any change in household income after a marginal increase in individual's gross earnings (e.g. 3% which corresponds approximately to an additional hour of full time work per week). Graphically, METRs can be illustrated with a budget constraint chart which plots net income against gross earnings (or hours worked), as the slope of this line corresponds to 1 – METR, i.e. the proportion of additional gross earnings retained by the individual.

PTRs and RRs are often calculated separately for short-term and long-term unemployed to reflect differences in the level of unemployment benefits depending on unemployment benefit entitlement and duration. As work incentive indicators, PTRs and RRs are calculated for working individuals who make the transition into an out-of-work status but also for non-working individuals making the transition into work. In the latter case, potential employment income is not observed and, hence, must be either predicted or assumed.

Generally, all these indicators are calculated assuming full tax compliance and benefit take-up, otherwise an underlying model of individual behaviour would be needed to estimate changes in tax liabilities and benefit receipt according to individual behaviour.

Work incentive indicators based on synthetic family types (often known as OECD-type indicators) can be useful to understand the functioning of the tax-benefit system. However, the great advantage of calculating the full range of work incentive indicators

[45] See Keane (2010) and Blundell (2012) among others.

[46] See Blundell (2006).

[47] See Sutherland and Figari (2013) and the official website (https://www.euromod.ac.uk).

[48] EUROMOD includes an add-on to help users in the calculation of METRs by defining the relevant parameters (e.g. marginal increase in gross earnings, definition of earning concept and so on) in a flexible way. A new add-on to calculate PTRs/RRs is in preparation in order to support users in the definition of the transitions in and out of employment and the definition of the relevant parameters (e.g. hourly wage, entitlement to unemployment benefits, and so on). Nevertheless, the user can derive the work incentive indicators by modifying the parameters of the baseline simulations, although extensive margin indicators require a lot of manual work to be set in a comparable way across countries.

[49] In principle other units of aggregation within the household could be specified.

discussed above on micro data is that they can be then estimated taking into account the distribution of earnings across the population. Furthermore, work incentive indicators can be decomposed by income sources and compared across different population subgroups in order to highlight policies particularly detrimental (or beneficial) to making work pay, or family types vulnerable to specific risks[50].

EUROMOD can also be used to monitor the changes in work incentives across time to track their evolution due to changes in the policy rules and the socio-economic characteristics of the population in order to assess, in a timely fashion, intended (and unintended) effects of policy reforms.

As regards in-work benefits, given the importance of the institutional and policy context, their analysis requires that the (actual or potential) interaction of these instruments with the rest of the tax-benefit system is fully taken into consideration in order to evaluate their overall redistributive and work incentive effects. EUROMOD is well suited for such type of analysis, and has been used extensively to analyse hypothetical reforms in Finland, France and Germany[51], Belgium[52], Southern Europe[53], and in Balkan candidate countries[54].

Most of these studies compare the potential effects of in-work benefits means-tested at family level, with individual-based schemes. The empirical results confirm that individual-based in work benefits lead to better incentives to work than family-based in-work benefits by avoiding high marginal tax rates on secondary earners. However, they are generally less efficient in targeting poverty as some of the low-wage earners live in medium or high income households. At the same time, also the targeting of the family-based in-work benefits can be compromised by the presence of extended and multigenerational families.

The information contained in EUROMOD and in each national Country Report[55] can be used to keep an up-to-date overview of the institutional rules of in work benefits across Europe and their budgetary and distributional effects.

As with other policy instruments, the effects of in-work benefits can be evaluated either *ex ante* (i.e. prior their implementation) or *ex post* (i.e. after they have been in operation).

In the case of *ex ante* evaluation, a microsimulation model such as EUROMOD will be needed to define counterfactual scenarios reflecting alternative policy regimes which can be defined according to rules either hypothetical or already proposed by policy makers. Very often, the policy making process starts with the evaluation of the potential impact of "borrowing" in-work policies from other countries. *Policy swapping* exercises are a clear example of ex-ante policy evaluation which may be particularly useful in exploring the likely impact of such policies on a given population of interest, to capture interactions between tax-benefit systems and the characteristics of such a population, and to assess the effectiveness of current policies.

In order to implement a meaningful policy swap, it is important to calibrate the parameters of the proposed policies (i.e. eligibility conditions, income thresholds, benefit amounts and so on) consistently taking into account the existing tax-benefit system and labour market regulations in place (e.g. the existence and level of the minimum wage). Different counterfactual scenarios can be particularly useful in

[50] For a recent estimation of marginal effective tax rates across Europe using EUROMOD, see Jara and Tumino (2013).

[51] See Bargain and Orsini (2006).

[52] See Vandelannoote and Verbist (2016).

[53] For a comparative analysis of the effects of in-work benefits in Greece, Italy, Portugal and Spain, see Figari (2010). Also, for Italy, De Luca et al. (2014) and Figari (2015), and for Spain, Ayala and Paniagua (2016).

[54] See Ranđelović et al. (2013) for in-work benefit reforms in Serbia, and Blazevski et al. (2013) for similar reforms in Macedonia.

[55] See EUROMOD Country Reports at https://www.euromod.ac.uk/using-euromod/country-reports.

understanding the extent to which a given policy's effectiveness can be attributed to the size and/or the design of the policy itself. Moreover, simulations can be performed under fiscal neutral constraints, by increasing existing revenue sources (e.g. calibrating the personal income tax rates), or by reducing expenditure associated with policy instruments that can be fully or partially replaced by the in-work benefit examined.

In the case of *ex post* evaluation, tax-benefit microsimulation models enable the researcher to disentangle ex-post what would have happened without a given policy. The counterfactual scenarios defined by a microsimulation model are often necessary because survey data do not contain information at sufficiently detailed level to identify the specific policy instrument to be evaluated.

Nevertheless, when the underlying survey reports information on a specific policy instrument, a comparison between entitlements simulated by EUROMOD and values reported in the survey can be used to assess the level of benefit non take-up which is an issue to be considered in evaluating the effectiveness of policies.

Given that the aim of in-work benefits is to facilitate the transition from welfare to work, these instruments should preferably be evaluated not only with respect to their budgetary and redistributive effects, but also considering the potential behavioural reactions of the individuals affected. In this case a behavioural tax-benefit model is needed to capture the individual behavioural changes based on simulated budget constraints and an estimated economic model of individual and family choices. A behavioural tax-benefit model can be used to derive labour supply elasticities numerically, and to predict behavioural responses to policy changes (in terms of labour supply at individual level).

When a full labour supply model is not available for a given country, or when the assumptions of a labour supply model are not considered compatible with the research question at hand, the static indicators (METRs, PTRs and RRs) help better understand the work incentives of individuals entitled to in-work benefits.

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