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Work incentives at the extensive and intensive margin in Europe: The role of taxes, benefits and population characteristics

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Work incentives at the extensive and intensive margin in Europe: the role of taxes, benefits and population characteristics

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Work incentives at the extensive and intensive margin in Europe: the role of taxes, benefits and population characteristics*

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Abstract

Tax and benefit systems play an important role in determining work incentives at both, the extensive and the intensive margin of labour supply. The aim of this paper is to provide a comprehensive comparative analysis of work incentives in the EU. Our analysis makes use of microsimulation techniques and representative household surveys from all 28 EU countries to compare the distribution of short- and long-term participation tax rates and marginal effective tax rates across population subgroups. We focus on people currently in work and characterise the population facing low work incentives in each country. Our results highlight the large variation in the distribution of work incentives across EU countries, explained not only by differences in the design of tax-benefit systems, but also by the characteristics of the labour force across countries. Unemployment insurance benefits contribute substantially to short-term participation tax rates and explain on average 20 percentage point difference between work incentives of short- vs. long-term unemployment. Our analysis further highlights the need to use microdata to study differences across countries in terms of the population subgroups facing low incentives to work with the aim to inform the policy debate on potential reforms to make work pay.

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Keywords: work incentives, extensive margin, intensive margin, social policy

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1. Introduction

For more than a decade, “making work pay” (i.e. ensuring that work is financially more attractive than relying solely on publicly provided social benefits) has come at the forefront of the policy agenda in European countries (Figari and Matsaganis, 2016). The design of tax-benefit systems plays in this sense an important role as it might influence the incentive to take up (or give up) a job and to work or earn more (or less). Providing a description of work incentives embedded in tax-benefit systems at the population level in Europe and identifying those groups with low work incentives is a necessary first step in order to assess the effectiveness of potential reforms to make work pay.

The analysis of the role of tax-benefit systems on work incentives has focused on two different margins: the extensive margin of labour supply (incentives to take up or give up work) and the intensive margin (incentives to work or earn more or less). At the extensive margin, the generosity and duration of unemployment insurance or social assistance benefits have often been associated with disincentives to take up work for certain population subgroups. At the intensive margin, high marginal tax rates have been discussed as factors reducing incentives to work or earn more.

Commonly used indicators of work incentives are usually based on synthetic (or hypothetical) households (see OECD, 2016). Such indicators are particularly useful to analyse the presence of unemployment or poverty traps among specific family types. However, they do not allow us to provide a full representation of the distribution of work incentives in the population, or to identify which subpopulation groups are more likely to be affected by low work incentives. The aim of this paper is therefore to provide a comparative and comprehensive analysis of work incentives at the extensive and intensive margin in all EU28 countries, based on representative household microdata. In particular, we use EUROMOD, the EU-wide tax-benefit microsimulation model, to compare the short- and long-term participation tax rates (PTRs) and marginal effective tax rates (METRs) in 2017 for individuals currently in work in the European Union. Further, our analysis provides a characterization of individuals facing low work incentives, and assesses how labour market incentives have changed over time across countries, in the last ten years. The focus on individuals currently in work allows us to assess, on the one hand, the potential unemployment traps workers might face in case they lose their jobs, and to consider, on the other hand, incentives at the intensive margin, which are important to identify individuals facing poverty traps while in work.

Recent studies, making use of representative household microdata, have focused on the effect of tax-benefit systems on work incentives in single countries. Pirttillä and Selin (2011) provide a description of METRs and PTRs in Sweden over the period of 2006-2010. Decoster et al. (2015) study the effect of changes in tax-benefit systems on work incentives at the extensive and intensive margin in Belgium over the period of 1992-2012. Bartels and Pestel (2016) compute short- and long-term PTRs in Germany over the period of 1993-2010 and assess the importance of work incentives in the decision of individuals to take up work. Navické et al. (2016) study the effect of potential reforms to unemployment and social assistance benefits on financial incentives to work at the extensive margin in Lithuania. Recent cross country studies using microdata are, on the other hand, scarce. Studies by Immervoll et al. (2007, 2011) and O’Donoghue (2011) have, for instance, looked at work incentives across European countries but for tax-benefit rules in place in 1998. More recently, Jara and Tumino (2013) present a comparison of work incentives for the EU27, but focusing only on the

intensive margin of labour supply. Finally, Collado et al. (2019) calculate the cost of reducing the poverty gap while holding work incentives at the extensive margin constant but only in three countries: Belgium, Denmark and the UK.

In summary, our research contributes to the literature in four different ways. First, it provides an up-to-date comparative analysis of work incentives at the extensive and intensive margin for all European countries, based on representative household microdata which enables us to assess the heterogeneity of work incentives across population subgroups. Second, we estimate both short- and long-term (when entitlement to unemployment insurance benefits has been exhausted) PTRs in order to highlight to which extent unemployment insurance and social assistance benefits affect work incentives at the extensive margin across countries, vis-à-vis income taxes and social insurance contributions. Third, we provide a portrait of the individuals facing low work incentives at the extensive and intensive margin across countries. Fourth, we assess how labour market incentives have evolved across countries during the last decade.

Our results highlight a number of interesting findings. First, there is a large variation in the distribution of work incentives, at the population level, across EU countries, highlighting the importance of using representative microdata in the analysis. Cross country differences in the distribution of work incentives reflect, on the one hand, differences in the design of tax-benefit systems and, on the other hand, differences in the composition of the labour market across countries. Second, our assessment of short- and long-term PTRs highlights the importance of unemployment insurance benefits on work incentives at the extensive margin. Long-term PTRs are on average 20 ppts. lower than short-term PTRs. Third, in general, employees and workers at the bottom of the earnings distribution face the highest short- and long-term PTRs, which might be related to the existence of lower limits for unemployment insurance benefits (short-term) or social assistance (long-term). At the intensive margin, the highest METRs are observed for high earners, which is most likely related to the progressivity of direct taxes in most countries. A comparison over time furthermore shows that these results have been quite stable over the last 10 years in most countries which can be attributed to a certain path-dependency of social policy.

The remainder of this paper is structured as follows. Section 2 discusses the methodology followed to calculate indicators of work incentives at the extensive and intensive margin using the microsimulation model EUROMOD, based on representative household microdata. Section 3 presents the results focusing on the distribution of work incentives across EU countries, the composition of work incentives by income source, the variation of work incentives across different population subgroups, a description of the characteristics of individuals facing low work incentives in each country, and an analysis of the evolution of labour market incentives over time. Finally, section 4 concludes by summarising the main findings and discussing their main policy implications.

2. Methodology

2.1. EUROMOD and the data

Our analysis makes use of EUROMOD (version H1.0), the tax-benefit microsimulation model for the European Union. EUROMOD simulates direct taxes and social insurance contributions liabilities, as well as cash benefit entitlements for the household population of all 28 EU Member States.¹ The underlying microdata used for our simulations in EUROMOD comes from the 2015 European Union Statistics on Income and Living Condition (EU-SILC) for all countries except the UK, where the 2014/2015 Family Resources Survey (FRS) is used. In this study, the tax and benefit rules used are those in place on the 30th of June 2017, which we refer to as 2017 policy systems. Market income and non-simulated income components in the data have been updated to 2017 according to actual changes in prices and incomes over the relevant period. No adjustment is made for changes in population composition between 2015 and 2017.

The tax-benefit microsimulation model EUROMOD is a unique tool to carry out distributional analysis and measure labour market incentives implied by tax/benefits systems for all European countries. The EU is also a perfect laboratory to study these issues, since countries vary widely in the generosity of unemployment and social assistance benefits, which will affect incentives at the extensive margin, but also in the progressivity of income taxes and the design of social insurance contributions, which will be reflected in differences in work incentives at the intensive margin. Belgium, Germany, Finland, Austria and Bulgaria, for instance, are characterised by generous unemployment insurance with a payment of around 60% of previous earnings and duration of 12 months or more. In Hungary, unemployment insurance also represents 60% of previous earnings but is paid only up to three months. The payment is lower in Lithuania, which is made of a fixed basic part plus a variable part starting at 40% of previous earnings and going down to 20% after three months. Unemployment insurance is the least generous in the UK with a flat payment between £58 and £73 per week for a duration of six months. Unemployment assistance is also available in Germany, Hungary, Austria and Finland, among others, which can act as a top-up or complement unemployment insurance when this is exhausted, or be available for individuals who are not eligible for unemployment insurance. Furthermore, many EU countries provide national social assistance benefits in order to guarantee a minimum level of income to low-income households (Guaranteed Minimum Income benefits, or GMI). The exception is Italy which introduced a national-level GMI in January 2018, which is not modelled in the current 2017 tax-benefit system. The generosity of social assistance varies widely across EU member states. In terms of income tax, the degree of progressivity varies across countries, with several cases of flat-tax systems, such as Bulgaria, Hungary, Lithuania, Estonia. Other characteristics of the tax-benefit system will also reflect differences in work incentives across countries, such as the existence of in-work benefits (particularly important in the UK and Hungary). Finally, EU countries also vary substantially in terms of labour market characteristics (e.g. the share of self-employed or part-time workers), the distribution of earnings and household composition (e.g. presence of secondary earners or children), which together with the design of tax-benefit systems will affect the distribution of work incentives at the extensive and intensive margin.

¹ See Sutherland and Figari (2013) for further information.

The tax-benefit model EUROMOD is used to calculate work incentives at the extensive and intensive margin for individuals currently in work. As previously mentioned, the focus on individuals currently in work allows us to consider incentives at the intensive margin and to provide insights into potential unemployment traps they might face in case they lose their jobs. At the extensive margin, Participation Tax Rates (PTRs) are calculated by means of simulating transitions from work into unemployment. Our analysis considers PTRs rather than net replacement rates because net replacement rates can be significantly influenced by market income of other individuals in the household, whereas PTRs allow us to abstract from such effects (O'Donoghue 2011). Thus, PTRs are a useful indicator of incentives to work at the extensive margin in order to highlight the role played by the tax-benefit system in the formation of incentives to work. Moreover, our analysis provides a description of both short- and long-term PTRs in order to highlight the role played by unemployment insurance (and social assistance) schemes in different countries. In our analysis, long-term PTRs are defined based on disposable income out of work when entitlement to unemployment insurance benefits has been exhausted. At the intensive margin, Marginal Effective Tax Rates (METRs) are computed assuming a marginal increase in earnings. For both PTR and METR, it is assumed that behaviour of other household members does not change when a person becomes unemployed or when her earnings increase.

We restrict our sample of analysis to individuals with positive earnings, aged 18 to 65, excluding those in full-time education or retirement. For the purpose of our analysis, we further assume full compliance in the sense that adjustments for tax evasion and benefit non take-up are not taken into account for the calculation of work incentives. As such, the results should be interpreted as the “intended effect” of the tax and benefit system on labour market incentives. Table A1 in the appendix presents the characteristics of the samples in each country.

2.2. Calculation of Participation Tax Rates (PTRs)

The participation tax rate (PTR) is an indicator of the financial incentives to start or to take-up work, implied by the tax-benefit system. As such, PTRs are an indicator of incentives at the extensive margin of labour supply. In particular, PTR can be defined as the proportion of earnings taken away by increased taxes and social insurance contributions or by reduced benefits when transitions from unemployment to work are simulated. Alternatively, PTR can also be interpreted as the proportion of earnings kept in the form of increased benefits or reduced taxes and social insurance contributions when transitions from work into unemployment are considered.

The approach used in this paper to calculate PTRs consists in moving people currently in work (employment or self-employment) in the data into unemployment and re-calculating their new disposable income by means of the microsimulation model EUROMOD, hence capturing the implications of tax and benefit systems under their new labour market status. As such, we interpret PTRs as the proportion of earnings kept in the form of benefits or reduced taxes and social insurance contributions. The rationale for our focus on transitions from work into unemployment is twofold. First, simulating transitions from unemployment or inactivity into work would require imposing number of important assumptions in order to simulate disposable income in work. For instance, wages as well as hours of work would need to be imputed for non-workers, and in some cases industry or occupation if tax-benefit rules depend on such characteristics. Second, focusing on those currently in work allows us to consider also incentives to work at the intensive margin for the same

sample of individuals, which are discussed in the next section. The approach used to simulate transitions from work to unemployment in EUROMOD is described in detail in Appendix A.

More formally, the Participation Tax Rate for individual i in household h can be expressed as:

$$PTR_i = 1 - \frac{Y_h^{W_i} - Y_h^{U_i}}{E_i}, \quad (1)$$

where E_i represents gross earnings of individual i when she is in work, $Y_h^{W_i}$ represents household disposable income when individual i is in work (W_i), and $Y_h^{U_i}$ represent household disposable income when individual i is in unemployment (U_i). In case of households with multiple earners, PTRs are calculated for each earner in the household separately, assuming that behaviour of other earners and household members does not change when a person becomes unemployed.

The role of different income sources on work incentives at the extensive margin can be described by decomposing household disposable income as the arithmetical sum of original incomes (O) (incomes before any tax and transfer), benefits and pensions (B), minus taxes (T) and social insurance contributions (S). Equation (1) can hence be rewritten as:

$$PTR_i = 1 - \frac{Y_h^{W_i} - Y_h^{U_i}}{E_i} = 1 - \left(\frac{\Delta O_h + \Delta B_h - \Delta T_h - \Delta S_h}{E_i} \right), \quad (2)$$

where ΔB_h represents, for instance, the difference between household benefits and pensions when individual i is in work and when individual i is in unemployment. Moreover, since the change in original incomes is equal to the change in earnings, the expression can be further rewritten as:

$$PTR_i = - \left(\frac{\Delta B_h - \Delta T_h - \Delta S_h}{E_i} \right) = PTR_i^B + PTR_i^T + PTR_i^S, \quad (3)$$

where the first component represents the change in benefits and pensions at the household level when individual i enters unemployment, as a percentage of individual i 's earnings; and the last two components report, respectively, the change in taxes and in social insurance contributions at the household level when individual i enters unemployment, as a percentage of earnings. In our analysis of PTRs, we further decompose benefits into three components: (i) unemployment benefits, including both unemployment insurance and unemployment assistance schemes; (ii) social assistance benefits, including minimum income schemes, housing benefits, etc.; and (iii) other benefits and pensions, which include family benefits, in-work benefits (such as the Working Tax Credit in the UK), disability benefits (such as health, disability and invalidity benefits) and public pensions. Decomposing benefits into unemployment, social assistance and other benefits is particularly important in the analysis of short- and long-term PTRs. The role of unemployment insurance benefits would be particularly important for short-term PTRs, while social assistance benefits would play a larger role in long-term PTRs, which are defined here based on disposable income out of work when entitlement to unemployment insurance benefits has been exhausted.

In principle, one would expect PTRs to range between 0 and 100 percent. While a PTR of 100 indicates a low work incentive as the income would remain the same, a PTR of 0 indicates a high work incentive. However, specific features of tax and benefit systems could result in PTRs taking values above 100 percent. For instance, the presence of lower limits of unemployment insurance schemes (minimum payment amounts for those satisfying the minimum required eligibility conditions) could result in disposable income in unemployment being higher than disposable income in work for low earners. Negative PTRs could be, for instance, the result of losing some type of tax

credits when entering unemployment. Although PTRs outside the range of 0 to 100 percent are plausible, in our analysis we exclude the top percentile of the distribution of PTRs if the PTR is above 150 percent and the lowest percentile if the PTR is negative. This restriction is chosen in order to reduce the risk of our calculations being biased by “outliers”, especially when we consider PTRs by earning quintiles and for different population subgroups.²

2.3. Calculation of Marginal Effective Tax Rates (METRs)

The marginal effective tax rate (METR) is an indicator of the financial incentives to work more (at a given wage rate) or earn more (i.e. increase effort at a given number of hours of work). As such, METRs are a popular indicator of the incentives faced by workers on the intensive margin of labour supply. In particular, the METR measures the proportion of a marginal increase in earnings that would be taxed away due to social insurance contributions, taxes and loss of benefit entitlement.

The calculations of METRs in EUROMOD are described in detail by Jara and Tumino (2013) and use the following steps. First, household disposable income is calculated. Then, for each earner in the household, in turn, individual earnings are increased by 3% and the corresponding household disposable incomes are computed.³ METRs are therefore specific to each earner in the household. More formally, the marginal effective tax rate of individual i in household h is given by:

$$\text{METR}_i = 1 - \frac{Y_h^1 - Y_h^0}{E_i^1 - E_i^0}, \quad (4)$$

where the numerator measures the change in household disposable income before (Y_h^0) and after (Y_h^1) the increase in individual earnings (E_i) and the denominator is equal to the increase in earnings itself.

As in the case of PTR, the role of different income components on METR can be calculated by decomposing household disposable income as the sum of original incomes (O), benefits and pensions (B), minus taxes (T) and social insurance contributions (S). Equation (4) can be then rewritten as:

$$\text{METR}_i = 1 - \frac{\Delta Y_h}{\Delta E_i} = 1 - \left(\frac{\Delta O_h + \Delta B_h - \Delta T_h - \Delta S_h}{\Delta E_i} \right), \quad (5)$$

where now ΔB_h represents, the difference between household benefits and pensions before and after the increase in individual i 's earnings. Since the change in original incomes is equal to the change in earnings, we obtain:

$$\text{METR}_i = - \left(\frac{\Delta B_h - \Delta T_h - \Delta S_h}{\Delta E_i} \right) = \text{METR}_i^B + \text{METR}_i^T + \text{METR}_i^S, \quad (6)$$

where the first component represents the change in benefits and pensions at the household level as a percentage of the earnings increase and the last two components represent the change in taxes and social insurance contributions as a percentage of the earnings increase.

² A similar procedure is suggested by Jara and Tumino (2013) in their analysis of marginal effective tax rates.

³ As such, we calculate the incentives to earn more rather than to work more, as we do not increase hours of work. The marginal increase of 3% in earnings roughly corresponds to an extra hour of work for a person working 40 hours per week (Jara and Tumino, 2013).

METRs would also be expected to take values between 0 and 100 percent. A value of 0 means that individuals keep all of the earnings increase, while 100 means that the total increase is taken away due to higher taxation, additional social insurance contributions or the loss of benefit entitlements. However, certain aspects of tax and benefit rules could result in METRs outside this range. METRs above 100 could, for instance, be related to the loss of some benefit entitlement, which would overcome the marginal increase in earnings. Negative values of METRs could, on the other hand, arise from tax allowances or benefit entitlements paid to people with income above a given threshold. Individuals crossing the threshold after an increase in earnings would experience a larger increase in household disposable income, resulting in negative METR (Immervoll, 2004). In our calculations, we exclude the top percentile of the METR distribution if the METR is above 150% and the lowest percentile if the METR is negative, in order to reduce the risk of our results being biased by “outliers”.

3. Results

This section presents results focusing on five aspects drawing from the use of microdata for the analysis of work incentives. First, the distribution of PTRs and METRs across the population of analysis is discussed in a cross country perspective. Then, work incentives are decomposed by three main income sources: taxes, social insurance contributions and benefits. Third, the use of microdata is exploited to present work incentive indicators for different population subgroups and to discuss their variation across countries. Fourth, a portrait of people facing low work incentives at the extensive and extensive margin in each country is provided. The fifth part of the analysis presents an overview of the main evolution of work incentives in the EU over the last decade.

3.1. Comparing PTRs and METRs across countries

This section discusses the general level and distribution of short-term PTRs, long-term PTRs and METRs with a focus on mean and median work incentives as well as the inter-quartile range between the 75th and 25th percentile of each indicator. The analysis reveals the advantage of using household representative data to calculate work incentives, and the results illustrate the significant variation in the distributions of short- and long-term PTRs and METRs across countries.

The first part of this section focuses on short-term PTRs, namely the rates during the first year of unemployment, presented in the first set of columns in Table 1. Results show the high variation of work incentives across countries: the highest average short-term PTRs can be found in Luxembourg, followed by France, Denmark, Belgium, Portugal, Finland and Germany. In general, these countries are characterised by quite generous unemployment insurance schemes with a strong contributory component, which can explain high PTRs in the short-term. The lowest average long-term PTRs are observed on the other hand in the UK, Romania, Cyprus, Lithuania and Malta. In the latter countries, the proportion of earnings that is kept in the form of increased benefits or lower taxes when an individual becomes unemployed is less than 50%. Thus, individuals have on average a higher incentive to be employed. On the other hand, rewards to work are relatively small in countries with high PTRs which in turn means that these countries provide quite a generous safety net in case of unemployment and/or that a substantial amount of gross wages are taxed away. In Luxembourg for

example, reduced taxes and increased benefit entitlements would mean that an employee would receive more than 80% of her earnings in case of unemployment, on average.

Table 1 also illustrates the importance of considering the distribution of PTRs rather than focusing on the average or median values only. The inter-quartiles presented in the table for each country highlight that, overall, national tax and benefit systems contribute to quite different distributions of PTRs across countries. Results show that countries with relatively similar mean PTRs might exhibit different distributions, as in the case of Denmark and Portugal, for instance. Further, the table shows that substantial dispersion of PTRs can occur at high (Denmark and Portugal), intermediate (Sweden, Netherlands, Greece, Bulgaria and Italy) or low (Ireland, Poland, the UK and Malta) average levels of PTRs.

Results also show to which extent the median of the PTRs distribution differs from the mean. We observe a higher concentration of people with higher-than-average work disincentives in countries where the median is higher than the mean. Generally, this is the case in countries with relatively high average short-term PTRs, and in particular in the Netherlands, Bulgaria and Italy. On the other hand, countries with relatively low average PTRs, show also greater concentration towards the bottom of the distribution (the median is lower than the mean), as in the case of Malta and Spain.

Table 1: Distribution of short/long-term PTRs and METRs in 2017

| | A. Short-term PTR | | | | B. Long-term PTR | | | | C. METR | | | |
|----|-------------------|--------|------|------|------------------|--------|------|------|---------|--------|------|------|
| | Mean | Median | p25 | p75 | Mean | Median | p25 | p75 | Mean | Median | p25 | p75 |
| BE | 74.3 | 77.8 | 70.9 | 83.9 | 48.1 | 47.6 | 40.6 | 55.2 | 54.2 | 55.3 | 53.5 | 59.7 |
| BG | 61.8 | 67.0 | 50.0 | 77.0 | 25.3 | 22.0 | 22.0 | 27.8 | 21.9 | 22.0 | 22.0 | 22.0 |
| CZ | 49.4 | 48.2 | 41.2 | 56.6 | 34.8 | 31.1 | 25.2 | 40.3 | 28.5 | 31.1 | 31.1 | 31.1 |
| DK | 75.2 | 74.9 | 66.8 | 84.3 | 56.8 | 49.8 | 41.6 | 66.0 | 46.0 | 42.8 | 40.4 | 55.8 |
| DE | 70.8 | 74.8 | 69.9 | 78.7 | 43.5 | 42.4 | 33.3 | 53.4 | 45.3 | 44.5 | 40.8 | 49.2 |
| EE | 51.4 | 55.5 | 44.9 | 57.1 | 34.5 | 30.7 | 26.4 | 38.0 | 23.1 | 22.9 | 21.3 | 22.9 |
| IE | 47.5 | 45.0 | 36.6 | 53.0 | 44.2 | 43.8 | 31.3 | 52.9 | 41.2 | 50.0 | 29.0 | 53.0 |
| EL | 61.7 | 55.7 | 49.7 | 66.8 | 45.8 | 42.8 | 33.5 | 54.2 | 32.6 | 36.0 | 16.5 | 40.8 |
| ES | 49.8 | 44.0 | 37.5 | 55.7 | 32.1 | 28.6 | 16.1 | 38.6 | 23.5 | 28.8 | 6.3 | 34.8 |
| FR | 77.3 | 79.6 | 75.9 | 82.6 | 39.9 | 38.7 | 30.1 | 49.1 | 39.5 | 37.1 | 22.3 | 43.5 |
| HR | 53.9 | 56.0 | 46.7 | 63.8 | 28.7 | 26.9 | 21.6 | 32.7 | 28.1 | 20.0 | 20.0 | 41.5 |
| IT | 56.6 | 64.8 | 42.0 | 70.7 | 24.1 | 25.0 | 15.6 | 34.1 | 40.2 | 43.4 | 35.6 | 49.1 |
| CY | 43.4 | 39.3 | 36.8 | 46.6 | 30.7 | 20.6 | 9.1 | 45.7 | 23.4 | 13.2 | 7.8 | 30.9 |
| LV | 53.2 | 58.1 | 50.4 | 62.3 | 30.2 | 28.5 | 25.0 | 30.4 | 31.1 | 31.1 | 31.1 | 32.9 |
| LT | 43.3 | 41.6 | 34.8 | 49.5 | 24.8 | 22.4 | 15.8 | 29.5 | 26.6 | 31.5 | 24.0 | 31.5 |
| LU | 82.8 | 87.8 | 82.7 | 90.0 | 43.6 | 42.2 | 28.2 | 56.1 | 43.7 | 43.5 | 28.9 | 50.0 |
| HU | 51.1 | 47.1 | 41.9 | 51.0 | 41.5 | 34.5 | 33.9 | 44.0 | 29.1 | 34.5 | 34.5 | 34.5 |
| MT | 38.8 | 30.5 | 26.2 | 48.5 | 34.9 | 25.4 | 20.3 | 47.8 | 25.8 | 25.0 | 23.2 | 31.1 |
| NL | 64.0 | 71.4 | 57.2 | 78.4 | 32.7 | 29.1 | 18.3 | 39.4 | 41.3 | 49.2 | 34.8 | 49.2 |
| AT | 68.3 | 68.6 | 64.9 | 71.4 | 47.8 | 45.0 | 33.9 | 57.0 | 42.3 | 43.3 | 36.8 | 48.2 |
| PL | 46.4 | 42.5 | 36.8 | 52.4 | 33.9 | 29.7 | 27.4 | 38.6 | 29.5 | 30.3 | 29.2 | 30.3 |
| PT | 74.0 | 79.2 | 72.8 | 86.9 | 42.3 | 36.7 | 21.6 | 56.7 | 31.0 | 35.8 | 11.0 | 39.5 |
| RO | 44.4 | 49.3 | 41.5 | 54.8 | 29.1 | 29.0 | 25.6 | 34.5 | 33.0 | 29.9 | 29.9 | 33.1 |
| SI | 59.0 | 58.1 | 49.7 | 67.8 | 39.6 | 36.3 | 30.5 | 46.0 | 39.7 | 38.6 | 30.6 | 42.2 |
| SK | 48.6 | 49.3 | 46.0 | 50.1 | 37.8 | 30.8 | 28.2 | 45.3 | 32.8 | 29.9 | 29.9 | 34.0 |
| FI | 70.6 | 70.8 | 68.9 | 74.2 | 56.0 | 51.6 | 48.4 | 60.0 | 45.6 | 46.9 | 39.5 | 50.5 |
| SE | 66.9 | 64.6 | 59.3 | 73.4 | 30.7 | 26.0 | 23.3 | 34.4 | 38.7 | 32.3 | 28.8 | 52.3 |
| UK | 45.0 | 40.7 | 35.1 | 53.4 | 35.7 | 32.8 | 22.3 | 47.1 | 38.9 | 34.4 | 32.0 | 42.5 |

Note: countries in alphabetical order (based on their national language). See also Figure A1-A3 for a graphical representation of the table.

Source: own calculations using EUROMOD version H1.0.

The PTRs presented so far show the financial incentive for working versus not working during the first year of unemployment. However, individuals may base their labour supply decision not only on the short-term change in income but may also take a longer time horizon into account (Bartels and Pestel, 2016). Once unemployed, individuals might also be faced with long-term unemployment and need to rely on the safety-net provided after receipt of unemployment insurance is exhausted. We present long-term PTRs and discuss their difference to short-term PTRs in the following paragraphs. In our analysis, long-term PTRs are defined based on disposable income out of work when entitlement to unemployment insurance benefits has been exhausted.

The second set of columns in Table 1 shows that long-term PTRs are substantially lower than short-term PTRs across countries. The difference between short- and long-term PTRs is driven by the effect of unemployment insurance schemes (see section 3.2), which provide a large degree of income protection in the short-run but have in general a limited duration. The finding is particularly important as, with a few exceptions, most studies based on microdata have overlooked the relevance of unemployment insurance benefits in affecting work incentives at the extensive margin. The ranking of countries, however, is almost preserved. The highest average long-term PTRs are registered in Denmark and Finland (both 56%), followed by Belgium, Greece, Ireland, Luxembourg and Germany. The lowest values of long-term PTRs instead are observed in Bulgaria, Italy and Lithuania. While short-term PTRs range between 83% and 38%, long-term PTRs range between 56% and 20%. Thus, work incentives increase with the duration in unemployment. This can be explained by the nature of unemployment benefits. The newly unemployed are mostly eligible for unemployment insurance which is however limited to a certain period. Once unemployment insurance is exhausted, the unemployed may be eligible for unemployment assistance in a limited number of countries (for instance in Germany, Hungary, Finland, the United Kingdom and Austria). Unemployment assistance is still very often earnings-related but the replacement rate (less generous) and eligibility criteria differ from unemployment insurance. Once the unemployed person has exhausted all kinds of unemployment benefits she would need to rely on the social net of last resort, such as social assistance benefits. Typically, social assistance benefits target low income individuals and households to guarantee a minimum level of income. As such, the level of the benefit is independent of previous earnings but often based on the household structure, the household's means and other income sources. The different nature, purpose and target groups of these benefits lead to differences in short- vs. long-term PTRs. The average difference across EU-28 countries is 21 percentage points. The largest differences are observed in Belgium (over 44 ppts.), followed by Bulgaria, Czech Republic, Denmark, Germany, Estonia, and Ireland. On the other hand, the smallest differences are registered in Ireland and Malta and in the UK. These low values suggest that work incentives in the latter countries are very similar for the short-term and the long-term unemployed.

Long-term PTRs are not only lower than short-term PTRs but also show a greater dispersion. This might result from high heterogeneity in targeting systems for social assistance benefits, as well as from differential effects of the tax-system on the lowest incomes. Further, we notice that in general, the median long-term PTR is below the national mean, for almost all countries, suggesting higher concentration of individuals at lower long-term PTR levels.

The third set of columns in Table 1 presents results on METRs. While the discussed PTRs focus on the incentive to actually participate in the labour market, the following sections focus on the incentives faced by workers on the intensive margin of labour supply. METRs measure the strength of the

incentive for individuals to slightly increase their earnings either through working more hours or bonus payments and promotion from the current employer or by getting a better paid job.

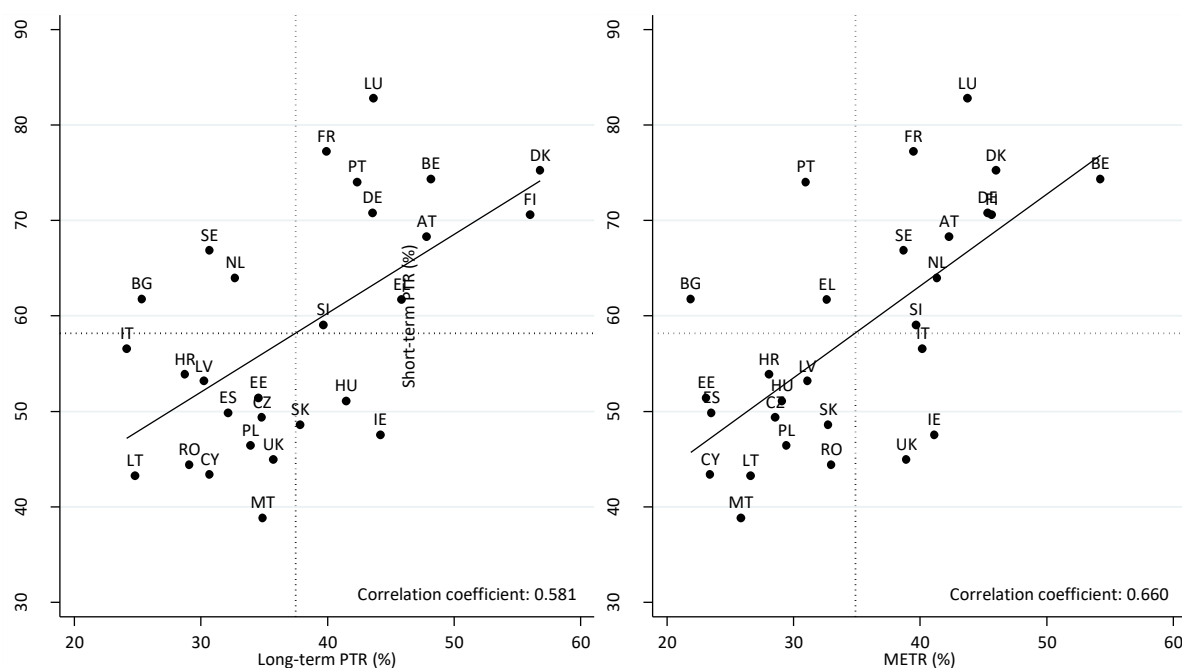
Countries with higher mean METRs are typically characterized by highly progressive tax systems, such as Belgium, where on average 54% of the gross wage increase is lost as a result of higher income taxes, SICs, and lower benefits. The other countries registering high disincentives at the intensive margin are Denmark, Finland, Germany, Luxembourg, Austria, Netherlands, and Ireland, where over 40% of the wage increase would be taxed away. Bulgaria (followed by Malta, Estonia, Cyprus and Spain) is the country providing the highest incentive to earn more: an increase in gross wage would be taxed away for less than 22% on average.⁴

Table 1 also presents results for the 25th and 75th percentile of METRs which are typically quite narrow in countries with a flat-tax system (or a tax-system based on very few tax brackets), such as Hungary, Bulgaria, Czech Republic, Slovakia and Lithuania. In these countries, the distribution of METRs is highly concentrated around the mean. Alternatively, we observe greater variation in METRs in countries like Spain, Cyprus, Croatia, Portugal, Greece, France, and Ireland, mostly due to the greater progressivity in the income tax system.

Figure 1 provides a summary of average PTRs and METRs in comparison to each other. It offers a useful synthetic characterization of countries according to the work disincentives implied by their tax/benefits systems. The left hand side presents short-term PTRs in comparison to long-term PTRs. In the top right quadrant, in fact, we observe countries that present above-average short-term and long-term PTRs. Here we find traditionally generous welfare states such as Nordic countries (Denmark and Finland), and continental welfare models (e.g. Germany, Belgium, France, Luxembourg, Austria). The chart is useful to identify also the countries which are relatively generous in the coverage of the short-term unemployed, but not so much for the long-term unemployed (e.g. the top left quadrant: Sweden, the Netherlands and Bulgaria). On the other hand, countries relatively more generous with long-term unemployed, such as Ireland, and Hungary, belong to the bottom right-quadrant. A numerous group is finally formed by countries with relatively low short-term and long-term PTRs consisting of the Baltic countries, the UK, and several Central-Eastern European countries (e.g. Poland, Romania, Czech Republic, and Slovenia).

⁴ Our calculations include employee SICs only while including employer SIC might actually lead to different tax wedges.

Figure 1: Short-term PTRs vs. Long-term PTRs (left) and vs. METRs (right) in 2017



Note: average values shown, the dotted line refers to the EU average.

Source: own calculations using EUROMOD version H1.0.

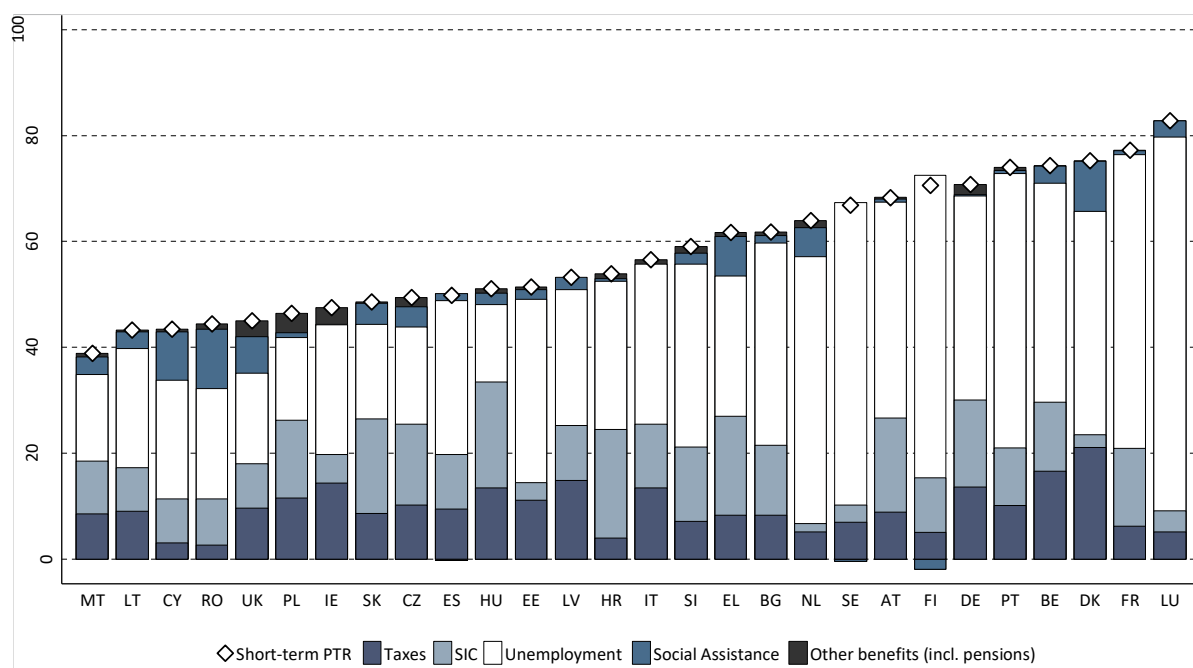
The right hand side of Figure 1 combines information on short-term PTRs and METRs to characterize countries on the basis of the incentives to work provided by their tax/benefits systems, on both the intensive and extensive margin. The top-right quadrant includes Nordic countries and continental welfare systems, meaning countries presenting low work incentives both at the extensive and at the intensive margin (e.g. through generous benefits and steep tax schedules). Many of these countries provide high levels of support to both short- and long-term unemployed which comes at a cost of high taxes and SICs for those in employment. In the bottom right quadrant we find Anglo-Saxon economies (UK and Ireland) and Slovenia, characterised by relatively low incentives towards short-term unemployment, but higher-than-EU average marginal tax rates, due to tax schedules which impose high marginal tax rates also at lower incomes. The opposite holds for countries like Portugal, Greece and Bulgaria, which seem to offer lower incentives at the extensive margin, but more so on the intensive margin. Finally, the bottom-left quadrant includes countries showing relatively higher incentives at both extensive and intensive margins, including mostly Eastern European countries, the Baltic countries, and Spain.

3.2. Decomposition of PTRs and METRs

While the previous section showed that countries comprise of different average levels emphasizing the general role of different tax-benefit elements, this section sheds light on the country-specific decomposition of the indicators. It discusses the decomposition of mean PTRs (short- and long-term) and METR in all EU-28 countries by main income sources: unemployment benefits, social assistance benefits, family benefits and pensions, and reduced income taxes and social insurance contributions (SIC).

Starting with short-term PTRs, Figure 2 shows that, on average, unemployment benefits are the most important component of PTRs, followed by social insurance contributions and direct income taxes. However, important differences exist across countries. Countries characterised by generous unemployment insurance systems show PTRs above 70%, and, in these countries, unemployment benefits represent the most important component driving short-term PTRs. For instance, Luxembourg is by far the country with the highest contribution of unemployment benefits to total short-term PTRs (over 70 pts.), followed by Finland, Sweden, France, and Portugal (over 50 pts.). Luxembourg and Sweden are characterized by high gross replacement rates for short unemployment durations (e.g. around 80% of previous wages). In Finland, most employees are covered by generous unemployment insurance in terms of benefits amount and duration, and thus, would receive a relatively high unemployment benefit compared to previous employment income (Jara et al. 2016).

Figure 2: Decomposition of mean short-term PTRs by income source in 2017



Note: countries ranked by mean short-term PTR. See also alternative representation of results in Figure A4. Source: own calculations using EUROMOD version H1.0.

At the other extreme of the distribution, in Slovakia, the UK, Malta, Hungary, and Poland, the contribution of unemployment benefits to short-term PTRs is the lowest in the EU (15 to 17 pts.). In these cases, the results can be explained by the short duration of unemployment insurance benefits (e.g. only 3 months in Hungary), by low or flat-rate unemployment benefits (e.g. in the UK and Malta), by low caps to maximum unemployment benefits amounts (e.g. in Hungary, Slovakia and Poland), and by low levels of or limitations to unemployment allowances after the expiration of unemployment benefits.

Other benefits, such as social assistance benefits, family benefits and pensions play comparably a minor role. In general, the average contribution of social assistance benefits to total short-term PTRs is 3 percentage points. Countries with higher contributions are Romania, Denmark, Cyprus, Greece and the UK, where the higher importance of social assistance benefits on PTRs can be explained by the presence of GMI (Guaranteed Minimum Income) schemes that do not rule out eligibility for the

short-term unemployed (Greece introduced a new GMI scheme in 2017). The contribution of other benefits is minor and mainly driven by family benefits. In Poland, the UK and Germany, family benefits account between 4 and 2 percentage points of short-term PTRs, respectively, but in almost all other countries, their contribution falls below 1 percent.

In some countries, high short-term PTRs are not only the result of unemployment benefits, but are also driven by reduced income taxes and social insurance contributions. This is the case, for instance, in Denmark, Belgium and Germany. All three countries have short-term PTRs above 70% and reduced income taxes and social insurance contributions account for up to 30 percentage points of total PTRs. In addition to Denmark and Belgium, the largest incidence of taxes and SIC to the short-term PTRs is observed in Greece, and, above all, Hungary (33 ppts. out of 52% total PTR). High contributions of reduced incomes taxes and SIC to short-term PTRs can also be found in Austria, Slovakia, Poland, Czech Republic, Italy and Latvia (27 to 25 ppts.). The relative importance of reduced income taxes (see Denmark, Belgium, Latvia, Ireland, Germany) vs. reduced SIC (Greece, Slovakia, Austria, Germany, Slovenia) varies in these countries.

In summary, although we can notice a number of contribution-financed “Bismarkian” systems (e.g. Belgium, Austria and Germany), typically providing a relatively stable safety net in case of unemployment (see Figari et al. 2011), among the countries with the highest incidence of reduced SIC and income taxes on PTRs, the composition is diverse and cannot be associated to a single typology of welfare-system.

The results in general show that labour market (dis)incentives seem to be associated to either benefits (e.g. the Netherlands) or taxes/SIC (e.g. Hungary), but rarely to both in most countries. It is interesting to point out that in Nordic countries and in several other European welfare states, benefits explain over 70% of total short-term PTR. While this appears to be in line with the conventional wisdom that benefit dependency is triggered by generous replacement rates (Cappellari and Jenkins 2014; Hansen et al. 2014; Königs 2014; Lalive 2007), we also find that the role of direct income taxes and SIC cannot be neglected.⁵ In fact, in at least half of EU countries, income taxes and SIC account for at least 40% of short-term PTR (over 60% in Hungary, and between 52% and 57% in Poland, Slovakia and Czech Republic). This finding will become more apparent when considering long-term PTRs, as explained in the next paragraphs.

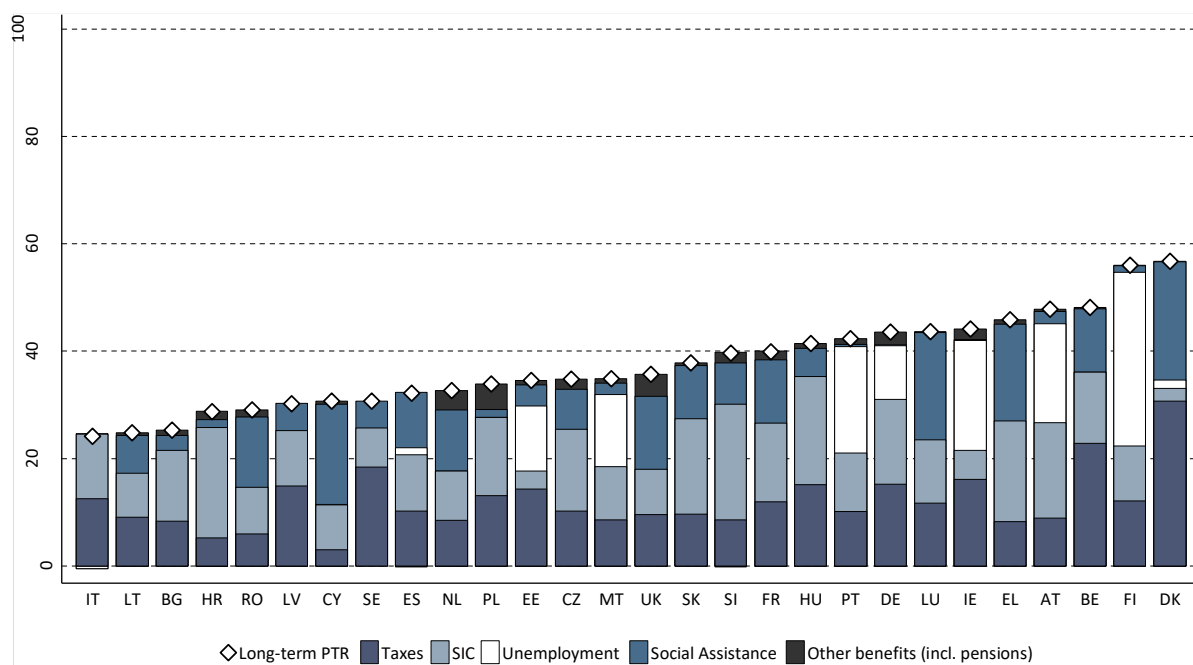
Turning to long-term PTRs, Figure 3 shows that the results of the decomposition change substantially with respect to short-term PTRs. Reduced taxes and SIC have a larger incidence on long-term PTRs than short-term PTRs, accounting on average for 24 percentage points, out of 36% (the average long-term PTR across the EU-28). The combined incidence of taxes and SIC on long-term PTRs is particularly high in Belgium, Hungary, Denmark, Slovenia, and Germany.

In most countries, unemployment insurance benefits have been exhausted and are replaced by follow-up benefits (e.g. unemployment assistance or social assistance). Comparing the decomposition of short-term PTR and long-term PTR highlights the importance of considering the tax-benefit system as a whole, as different elements contribute to work incentives when

⁵ Note, however, that we focus on people currently in work whereas people out of work are likely to have lower earnings potential and hence a greater benefit trap. An analysis of short-term PTRs for low earners only, i.e. a group likely to be more similar to those currently out of work, shows that SIC still contribute to short-term PTRs (12% on average) even for low earners while this is less the case for income tax (1% on average).

unemployment duration matures. In Denmark, the high long-term PTR reflects the generosity of social assistance benefit, which is able to provide still at least over half of household's disposable income after entitlement to unemployment insurance benefits has been exhausted. Fernandez Salgado et al. (2014) highlight the role of a developed social assistance scheme and the danger of falling below the poverty threshold if such a system does not exist. Also the relatively high value for Greece likely reflects the introduction of the new GMI. Other countries in which social assistance benefits matter to explain long-term work incentives are Luxembourg and Cyprus, and to a lower extent, the UK, and Romania. In the case of Bulgaria, instead, the low long-term PTRs relate to the very low level of social assistance benefit available to people exhausting entitlements to unemployment insurance. The same is true for Lithuania. In Italy, the low value stems probably from the fact that the 2017 tax/benefit system does not yet include the new Italian GMI ("Reddito di Inclusione"), introduced in January 2018; in the absence of last-resort safety nets, a substantial share of the long-term unemployed in Italy is left with very low or no incomes.

Figure 3: Decomposition of mean long-term PTRs by income source in 2017



Note: countries ranked by mean long-term PTR. See also alternative representation of results in Figure A5. Source: own calculations using EUROMOD version H1.0.

Unlike Denmark, high long-term PTRs in several countries (e.g. Finland, Austria, Germany, Portugal, Hungary and Slovenia) do not result from particularly generous social assistance benefits, but rather from the effect of reduced taxes and SIC, and, in some cases (Finland, Austria, Ireland, Germany and Portugal), from generous unemployment benefits for the long-term unemployed. In Finland, for instance, the high long-term PTR is mostly explained by high unemployment benefits, first, and secondly by reduced income taxes and SIC, while social assistance benefits have only a minor influence on long-term PTR. Finland, in fact, maintains relatively generous unemployment assistance benefits also in the long-run, once the entitlement to the main unemployment insurance benefits is exhausted: as a result, unemployment benefits still account for 32 percentage points out of 55 (almost 60%) of the long-term PTR. Further, in Ireland, high unemployment benefits and reduced

income taxes explain most of the long-term PTR (20 and 16 percentage points, respectively). In Germany, long-term PTR can be mostly explained by reduced income taxes and SIC, and, to a minor extent, by unemployment benefits. Similarly in Portugal, long-term PTR are mostly driven by unemployment benefits, and by reduced taxes and SIC.

In Hungary, on the contrary, the components that account the most for high long-term PTR are reduced taxes and SIC, rather than the generosity of last resort social assistance programs or benefits for the long-term unemployed. Finally, also in Slovenia, high long-term PTR are mostly due to high SIC, and, to a minor extent, reduced income taxes. Slovenia also shows the highest contribution of SIC to total long-term PTR (21 percentage points) in the EU, followed by Croatia, Hungary, Greece, Slovakia and Austria.

As in the case of short-term PTRs, family benefits and pensions impact only marginally on mean long-term PTRs. The countries where family benefits matter the most for long-term PTRs are Poland, the UK, Czech Republic and Slovenia. One possible explanation could be that, in these countries, some family benefits are designed as in-work benefits or tax credit and allowances, which therefore are lost when beneficiaries move from employment into long-term unemployment. Another possible explanation could be that these benefits entail last resort programs specifically designed for households with children, where beneficiaries are long-term unemployed. The relatively larger effect found in Poland, could be explained by the generous child benefit “Family 500+”, launched by the government in 2016. In the remaining countries, the contribution of family benefits to long-term PTRs falls below 2 percent.

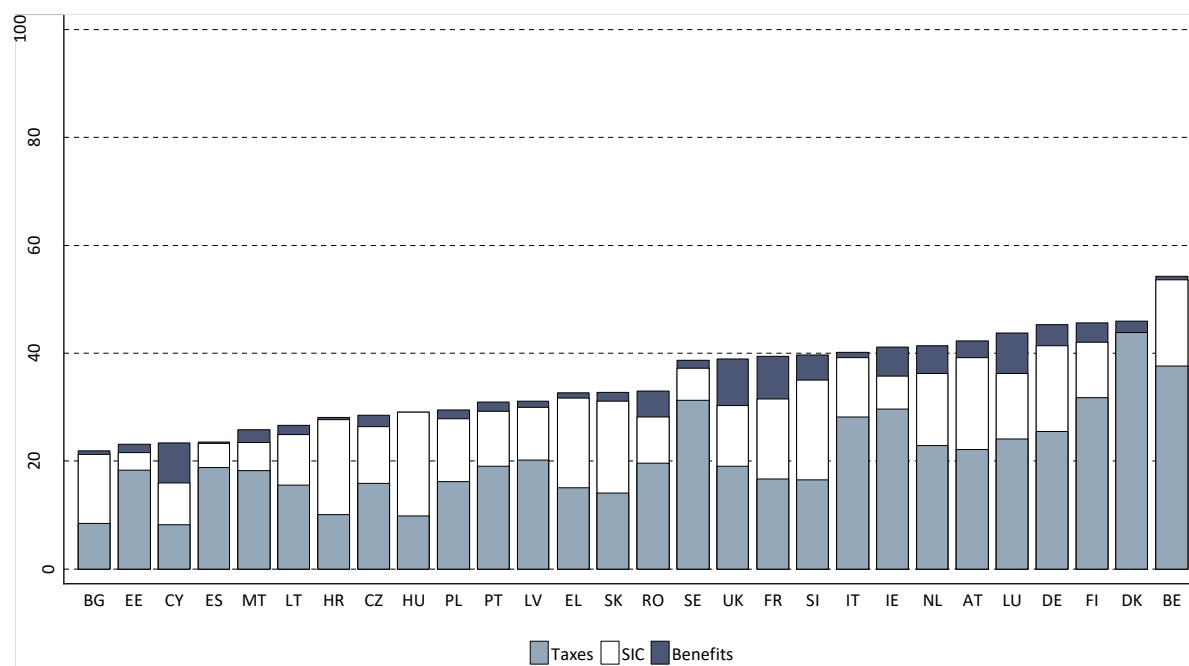
Overall, only in a minority of countries (Cyprus, Finland and Ireland) social assistance and other benefits represent the most important component of long-term PTRs. In general, reduced taxes and social insurance contribution are actually more important determinants of long-term PTRs and in half of the EU countries they account for at least 70% of the total PTR.

The role of taxes and SICs is even more pronounced when focusing on METRs (Figure 4). Our decomposition exercise shows the relative incidence of taxes, social insurance contributions and (loss of) benefits to the mean METR. Higher taxes associated to higher earnings represent the most important component of mean METRs. Denmark registers by far the highest contribution of direct income taxes to average METR (44 ppts out of 46 METR), followed by Belgium, Finland, Sweden, Ireland, Italy and Germany. On the contrary, in countries characterized by lower progressivity, such as Lithuania, Slovakia, Hungary, and Bulgaria, the contribution of taxes to the mean METR remains low, between 15 and 8 percentage points only.

In Hungary, increases in social insurance contributions due to higher earnings explain over 19 percentage points of average METR. Other countries where high SIC explain an important component of METRs are: Slovenia, Croatia, Slovakia, Austria, Greece, Belgium and Germany.

Finally, loss of benefits associated with higher earnings seem to matter in the UK (9 ppts.), followed by France, Luxembourg, Cyprus, Ireland, the Netherlands, Romania and Slovenia. In the UK, the loss of benefits is associated with a reduction in means-tested benefits (in-work benefits and housing benefits), as income from labour increases.

Figure 4: Decomposition of mean METR by income source in 2017



Note: countries ranked by mean METR. See also alternative representation of results in Figure A6.
 Source: own calculations using EUROMOD version H1.0.

Overall, these results firstly suggest that various tax-benefit elements contribute differently to work incentives at the intensive vs. the extensive margin and secondly, may also be different for work incentives at the intensive margin when unemployment duration matures. It is furthermore important to note that while the role of taxes and SICs is obvious in the case of METRs, it also needs to be taken into account for PTRs.

3.3. Heterogeneity across population subgroups

An advantage of using representative data for the analysis of work incentives is that it allows us to compare indicators across different population subgroups. Tables A2-A4 in the Appendix compare mean PTRs (short- and long-term) and METR for a wide range of sub-population groups. The following subsection discusses the most important differences between sub-population groups for each of the indicators.

In terms of short-term PTRs, marked differences are observed between employees and the self-employed, across earnings quintiles, and, to a minor extent, between age groups and type of earners (main vs. secondary). In general, employees face higher PTRs than the self-employed, since the latter are not always eligible for unemployment insurance benefits, or are subject to lower compulsory social insurance contribution rates. However, in a number of countries, the reverse is true: for example, in Hungary, the PTR for self-employed exceeds employees' by 39 percentage points because the self-employed are eligible for unemployment insurance benefits and face high social insurance contributions.

Short-term PTRs are much higher for workers in the bottom vs. the top quintile of the earnings distribution. These differences can be explained by the existence of lower limits in unemployment insurance schemes (minimum payments amount for people satisfying eligibility conditions) and by

the access to out of work benefits, such as minimum income schemes (e.g. as in Greece) and other social assistance benefits. While high PTRs for low-paid reflect the degrees of income protection provided by the tax-benefit system, overly high PTRs at the bottom of the earnings distribution can discourage labour market participation among the poor, creating benefit dependence and unemployment traps. In some countries, low earners face a higher incentive to work than top earners, due to the presence of important tax allowances and family benefits in the upper part of the earnings distribution, as in the case of Italy (where the gap between top and bottom earners' PTR reaches 21 ppts.), Netherlands, Latvia, Germany, Romania and Slovenia.

Differences in PTRs by skill, working hours and age levels are more difficult to interpret since they are more likely to be confounded with differences associated with earnings: for instance, older workers might exhibit higher PTRs because they enjoy higher earnings, and therefore fall into higher tax brackets. The evidence actually shows that older workers face higher PTRs than younger workers in almost all countries (the difference reaching 20 ppts. in Slovenia and 16 in the Netherlands), with the exception of Malta and Greece. As far as skills groups are concerned, low-skilled workers tend to show higher PTRs than medium- and high-skilled workers in almost all countries, although variation of PTRs across skills groups is relatively small. The evidence for part-time workers is mixed. We observe larger disincentives for part-timers in several countries (e.g. Greece and Hungary) while in others (e.g. Italy, Romania, Latvia and Germany), part-time workers seem to face lower disincentives to work than full-time workers. This is mainly driven by lower social security contributions paid by this group. High PTRs for part-timers can be associated to eligibility of social assistance benefits given the usually low level of earnings received by this group. Finally, main earners exhibit in general higher PTRs, which is related to the larger contribution of unemployment insurance benefits given that the latter are proportional to previous earnings in most countries.

As far as long-term PTRs are concerned, we notice that the variation across sub-groups tends to decrease compared to short-term PTRs, and in some cases the results point into different directions. In contrast with short-term PTRs, the self-employed show in general higher long-term PTRs than employees. The difference between the short- and long-term scenarios reflect the role of unemployment insurance schemes in work incentives. During the first year of unemployment (short-term) employees face higher PTRs than self-employed because in general the latter group is not covered by unemployment insurance. Once unemployment insurance has been exhausted (long-term) the self-employed exhibit higher PTRs reflecting a stronger contribution of social assistance to PTRs for this group. The gap between main and secondary earner PTRs tend to increase in the long-term. The higher long-term PTRs of main earners are driven by two factors. On the one hand, the decrease in household disposable income is smaller in case of unemployment of secondary earners compared to main earners meaning that the contribution of social assistance (and other means-tested benefits) to PTR would be smaller for secondary earners. On the other hand, taxes and SICs have a stronger incidence on long-term PTRs compared to benefits and their incidence would be larger for individuals with higher earnings (main earners compared to secondary earners). The results are in line with studies by Immervoll et al. (2011) and more recently Bartels and Shupe (2018).

In the case of METRs, the largest differences are observed between earnings quintiles as well part-time vs. full-time workers. Earners in the top quintile of the distribution face higher METRs than those at the bottom in almost all countries, and the difference can reach more than 30 percentage points like in Italy, Greece, Ireland and Spain. Higher METRs at the top of the earnings distribution

mainly reflect the progressivity of income taxes, with high earners being paying a higher proportion of the additional earnings in taxes. Results furthermore show almost no difference between in METRs of employees and self-employed, as well as between main and secondary earners, with a few exceptions.

3.4. Low work incentives at the extensive and intensive margin

While different sub-population groups face different levels of work incentives in general, it is also useful to have a portrait of those facing low work incentives specifically. High levels of PTRs and METRs are an indicator of low incentives to work or to increase labour supply. In this section, we provide a cross country comparison of the share and the characteristics of individuals facing low work incentives at the extensive and intensive margin (see Table A5-A7 in the Appendix for the underlying data).

In the literature, there is no consensus yet as for which level of PTR or METR should be considered high enough to identify people as facing low work incentives. Two different approaches could be considered. On the one hand, a relative threshold could be defined for each country based, for instance, on the median value of each indicator in each country. This would allow taking into account the very different distributions of work incentive indicators across countries. However, from a cross country comparative perspective, the relative threshold might be too low to characterise some individuals as facing low work incentives in certain countries. In this sense, the definition of an absolute threshold seems more appropriate for a comparable characterisation of groups facing low incentives to work even if it neglects the variation in the dispersion of work incentives across countries. Given our focus on cross-country comparison, in this section we discuss the results based on an absolute threshold, whereas results based on relative thresholds are provided in the appendix (see Table A8-A10). We follow an approach taken by Jara and Tumino (2013) who define the threshold as the average plus one standard deviation of the mean across all countries. In the case of short-term PTRs, the absolute threshold corresponds to a value of PTR equal to 75%. For both long-term PTRs and METRs, the value of the threshold is 50%.

The share of workers facing high short-term PTRs varies widely across countries. In Latvia, Croatia, Czech Republic and Slovakia, less than 5% face a high disincentive to work, while the share is as high as 81% in France and 84% in Luxembourg. In more than half of the countries, the majority of people with low work incentives are women, particularly so in Italy and Ireland. Young workers (below 30 years old) are typically the least affected by low work incentives (with the exception of Malta). This might be related to age restrictions for the entitlement of certain benefits or to the fact that young workers may not fulfil eligibility conditions based on work history, for instance, for unemployment insurance benefits. In terms of skill groups, the majority of individuals facing high short-term PTRs are medium skilled, while low-skilled represent the largest share only in a small number of countries (Spain, Malta, Portugal, Romania and the UK). Those facing high disincentives are furthermore less likely to be self-employed (given that not all countries provide unemployment benefits for the self-employed) and more likely to be main earners (with the exception of Czech Republic, Italy, Malta and Poland). A very high share (more than 60%) are part-timers in Ireland, followed by Greece, Spain, Austria and the UK (with more than 40%). In terms of earning quintile groups, the largest share is made of individuals with low earnings in most countries, which might be related to the existence of lower limits for unemployment insurance benefits or social assistance (e.g. minimum

payments amounts in both cases for those satisfying minimum requirements). The picture is rather different in Germany and the Netherlands, where individuals at the top of the earnings distribution are more likely to be among those with high short-term PTRs.

There is also significant variation in the share of individuals affected by high long-term PTRs: Bulgaria and Italy have the lowest share of the working population affected by high long-term PTR (below 3%), while Finland, Denmark and Belgium, on the other end of the spectrum, show the highest incidence of high long-term work disincentives (affecting over 40% of workers). The portrait of those facing low long-term work incentives is similar to short-term PTRs in terms of individuals being more likely to be employees, middle-aged, main earners and low earners. However, contrary to the case of short-term PTRs, the largest share of people facing high long-term PTRs consists of men. This is also confirmed in results for part-time workers who are mostly women and constitute only a small group of those faced with low long-term PTRs in most countries.

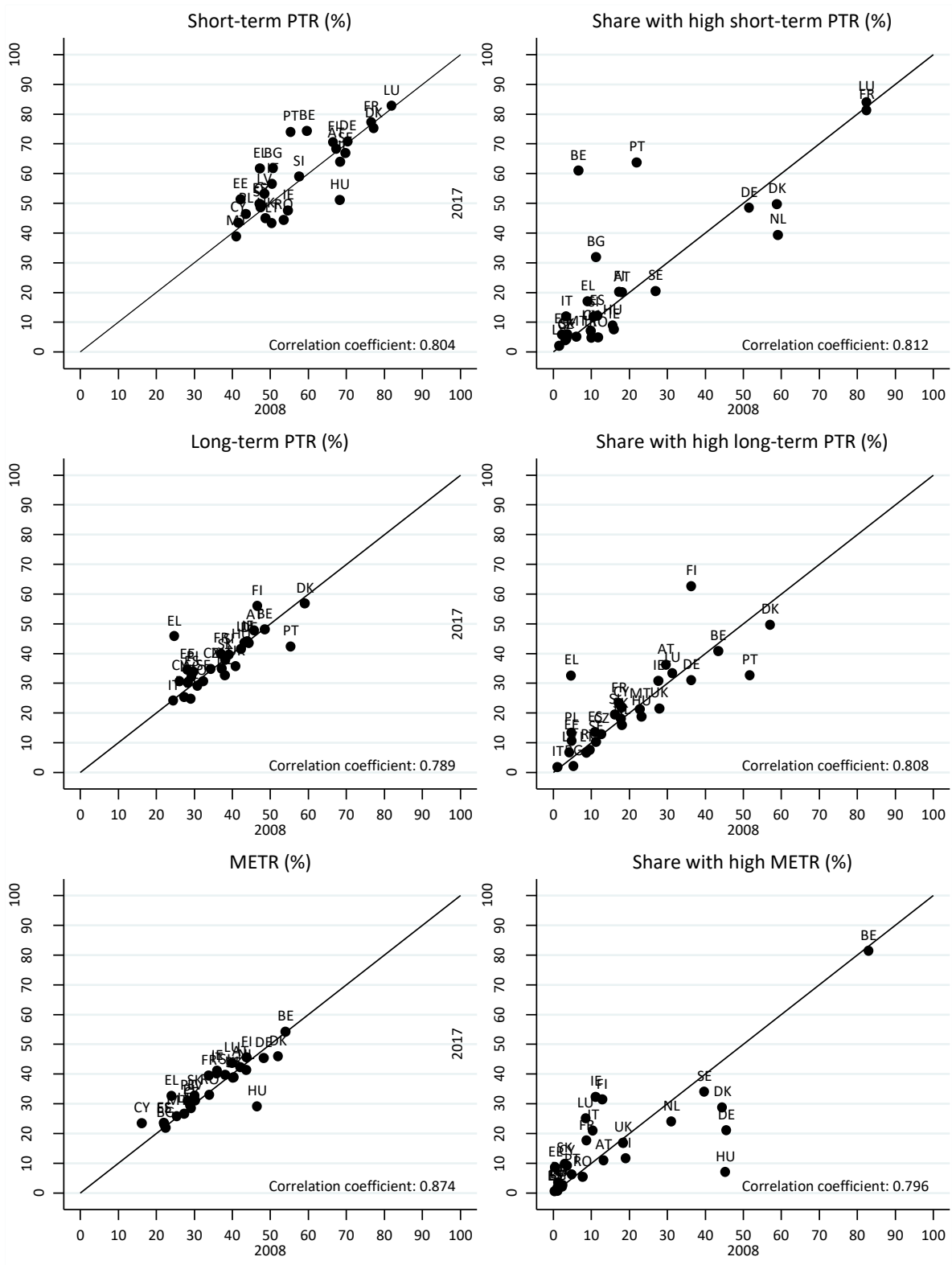
Finally, the share of people facing low work incentives at the intensive margin varies across countries but to a lesser extent if compared to the variation in the incentives at the extensive margin (except for Belgium). The share of workers facing low work incentives at the intensive margins (METR above 50%) ranges, in fact, from 0.5% in Spain to 34% in Sweden, and reaches 81% in Belgium, which remains an outlier. The portrait of individuals facing low incentives at the intensive margin is quite similar to results for long-term PTRs. However, results by gender exhibit greater variation with more countries showing higher shares of women facing high METR (especially in the Czech Republic and Cyprus). The same result holds across earning quintiles, where high earners are the largest group facing high METRs, specially in Greece and the Scandinavian countries. In addition, differences between employees and self-employed are more pronounced in most of the countries. In Lithuania, over 50% of part-time workers face METRs above 50%, while in the rest of the countries, this percentage is much smaller, and particularly low (around 4%) in Italy and Hungary.

Probit results (provided in Table A11 in the Appendix) show to what extent differences by characteristics are actually correlated with differences in the composition of other factors. Overall, earnings levels and being employed as opposed to self-employed seem to be the strongest explanatory factors for low work incentives. All other workers' characteristics are significant though the magnitude of the effect seems smaller. In particular, the effect of gender is comparably small after taking differences in age, skill-level, earnings and employment characteristics into account (especially in the case of METRs).

3.5. Evolution of work incentives over time

This final section analyses the evolution of work incentives between 2008 and 2017. We use the same EUROMOD input datasets for both policy years in order to control for changes in the population and labour market composition. Thus, the discussed changes in work incentives capture the effect of policy changes (or to some extent also the result of no policy changes if, for example, earning levels increase more than minimum levels of unemployment insurance benefits). In Figure 5, the left-hand-side chart shows the change in the work incentives at the extensive and intensive margin, whereas the right-hand-side shows the share of workers affected by low work incentives in the two periods.

Figure 5: Changes in work incentives and share with high work disincentives, 2008 vs. 2017



Source: own calculations using EUROMOD version H1.0.

Work incentives at the extensive and intensive margin have remained rather stable in most EU countries. This is especially the case for METRs and long-term PTRs whereas larger changes are observed for short-term PTRs.

The countries with the largest increases in short-term PTRs are Portugal, Belgium, Greece, Bulgaria and Estonia. The country with the largest decrease in short-term PTRs is Hungary followed by Romania. In Belgium, Portugal and Bulgaria, policy changes have also resulted in a larger group of people facing high short-term work disincentives. The same is true for Finland and Greece in terms of long-term PTRs.

The drop by more than 10 percentage points in short-term PTRs in Hungary can be explained by changes to the unemployment insurance benefit. In fact, the maximum duration for receiving unemployment insurance benefits decreased from 9 to 3 months and the maximum benefit amount changed from 120% of the minimum wage to the level of the minimum wage. Given that the benefit duration was below 12 months in both years, these changes had no effect on long-term PTRs. Also the changes in Romania are mostly driven by the unemployment insurance scheme. However, differently from Hungary, these changes are not the result of actual policy changes, but rather the result of the lack of update in the flat rate amount of the unemployment insurance benefit.

Also increases in work incentives at the extensive margin are mostly attributed to changes in unemployment insurance benefits due to increases in the duration of the unemployment insurance benefit or the above wage increase of minimum and maximum benefit levels. Bulgaria increased the qualifying period which potentially increases the number of people being eligible for the benefit in case of unemployment. Given that the unemployment insurance benefit is paid for less than a year in most countries, these changes had no effect on long-term PTRs.

In Portugal, the main policy changes over time consisted in a reduction of both the qualifying period for unemployment insurance benefits and the benefit amounts. The group of unemployed people eligible to unemployment benefits was expanded to include people with less work experience, and, as a consequence, the group of people eligible for receiving unemployment benefits for a full year has increased. All together, these changes led to a substantial increase in work disincentives by almost 20 percentage points. At the same time, changes in unemployment assistance seem to have led to a decrease in long-term work incentives over time. Nevertheless, Portugal is still among the countries with the highest long-term PTR.

Changes in tax and social insurance contribution have contributed to changes in work incentives to some extent but have often been counter-balanced by other policy changes. In Estonia, changes in the tax system leading to higher disincentives have been balanced out by changes to the SICs. In Belgium, the increase in short-term PTRs would have been higher but was to some extent offset by changes to the tax system.

Changes to various tax-benefit elements contributed to the increase in short-term PTR in Greece. The most important contribution to the increase of both short- and long-term PTRs was the introduction of the Guaranteed Minimum Income scheme in 2017, a reform that substantially improved the safety-net of people in unemployment or unable to work. Despite the increase in long-term PTR, the share of workers exposed to high long-term PTR in Greece (around 30%), remains below those of countries with more generous social assistance systems for the long-term unemployed (e.g. Austria, Belgium, Denmark, Finland). In Finland, on the other hand, changes

towards a more generous social assistance scheme substantially increased the long-term PTR, crowning Finland as the country with the second highest long-term PTR.

Less changes have taken place for work incentives at the intensive margin. The exceptions are Denmark and Hungary with decreases in METRs as well as Greece and Cyprus with increases. At the same time, the share with high METRs has changed in many countries with substantial decreases in Hungary - due to the change in tax system - but also in Germany. Increases are especially apparent in Finland and Ireland.

The substantial changes in Hungary are largely based on the shift to a flat-tax system. Also in Denmark, changes are based on changes of the income tax system and more specifically on the abolishment of the medium bracket tax, an increase of the earned income tax and a reduction in several other taxes. Nevertheless, Denmark remains to be one of the European countries with the highest METRs. Changes to the Greek tax and SIC system have not only increased disincentives at the extensive margin but also the intensive margin. Different to changes in the other three countries, changes in METRs for Cyprus can mostly be explained by changes in benefits. The previously universal child benefit was turned into a means-tested benefit which results in a loss of the benefit when parent's earnings increase.

4. Conclusions

This paper presents a cross-country comparison of work incentives at the extensive and intensive margin of labour supply in EU28 countries. Our analysis makes use of the EU tax-benefit model EUROMOD and representative household microdata to estimate short- and long-term participation tax rates (PTRs), and marginal effective tax rates (METRs) in 2017 for individuals currently in work. We show that the design of tax-benefit systems plays an important role in the level and distribution of work incentives and that the role of specific elements differs by country and indicator. The use of microdata allows us to characterise the mean level and distribution of work incentives at the population level and to identify groups facing low work incentives.

Our findings illustrate the important variation in the mean level and the distribution of work incentives, at the population level, across countries, highlighting the importance of using representative microdata in the analysis. Countries with relatively high average short-term PTRs are more likely to show a distribution of PTRs that is skewed towards the top of the distribution. On the other hand, countries with relatively low average PTRs show greater concentration towards the bottom of the distribution. Also results for long-term PTRs suggest a higher concentration of individuals at lower long-term PTR levels. The distribution of work incentives at the intensive margin is mostly driven by the tax system with flat-tax countries typically showing a very narrow distribution and progressive income tax systems leading to greater variation.

Numerous factors contribute to the differences in the distribution of work incentives across countries, reflecting for instance the underlying differences in the design of tax-benefit systems and in labour market conditions. Our comparison between short- and long-term PTRs highlights the importance of unemployment insurance benefits on work incentives at the extensive margin. In most countries, unemployment insurance schemes represent the most important component driving short-term PTR but to different extents depending on the generosity or the duration of the benefit in each country. Countries such as Luxembourg, Finland and Sweden, characterised by generous

unemployment insurance schemes, present high short-term disincentives (83% in Luxembourg, 71% in Finland and 67% in Sweden) on average. At the same time, these countries also provide a stable income source in case of short-term unemployment. In the long-term, the existence of unemployment assistance and the generosity of social assistance benefits characterises countries ranking high in terms of mean PTR (see for example Finland, Austria and Ireland). Work incentives not only increase significantly with duration in unemployment but also show a greater dispersion driven by a greater heterogeneity in targeting systems for social assistance benefits as well as the increased role of reduced taxes and social insurance contributions.

Tax-benefit policies lead to diverse system-specific effects across countries as well as diverse effects with respect to short- or long-term PTRs. It furthermore suggests that various tax-benefit elements contribute differently to work incentives at the intensive vs. the extensive margin. At the intensive margin, in most countries, reduced income taxes contribute the most to METRs followed by social insurance contributions. While the role of taxes and social insurance contributions seems to be an obvious factor influencing METRs, we find that the role of these policy instruments also needs to be taken into account at the extensive margin. Income taxes and SIC account for at least 40% of short-term PTRs in at least half of the EU countries and for all countries with the exception of Cyprus for long-term PTRs.

These findings have relevant implications for the literature on benefit dependency on the one hand, and for policy design on the other. For instance, given that the benefit component of the short-term PTR is relatively low in countries like Slovakia, UK, Malta, Hungary and Poland, compared to the taxes and SIC component, it is unlikely that addressing only issues related to benefit levels would have a major impact on short-term work incentives. In fact, the literature on benefit dependency typically focuses on the implications of last-resort benefits levels and duration on the probability of leaving welfare (Cappellari and Jenkins 2014; Hansen et al. 2014; Königs 2014; Lalive 2007), while the potentially sizeable role of reduced taxes and SIC is typically neglected. The presented results could explain low incentives to work in countries where the level of social assistance benefits is quite low, but the reduction of income taxes and social insurance contribution following the exit from formal employment is more substantial (e.g. Bulgaria). These findings also have implications for countries where social protection benefits are subject to fiscal consolidation measures or spending reviews, given their potential disincentive effects on labour market participation. For this purpose, it would be important to quantitatively assess whether social assistance benefits are actually the main factor driving long-term PTRs. If, on the other hand, reduced income tax and SIC appear as the main determinants of long-term PTRs, then policy measures aiming at reducing labour market disincentives should be probably more geared towards alleviating the tax burden on households more at risk of falling into social assistance (e.g. low-income households), especially in countries with high informality rates.

Overall, a comparison of work incentives in 2008 and 2017 shows, that fiscal consolidation and policy reforms have not necessarily led to substantial changes in work incentives with the exception of some countries. In these countries, changes in work incentives at the extensive margin have been mostly affected by benefit reforms while changes in tax and social insurance contribution have contributed to changes in work incentives to some extent but have often been counter-balanced by other policy changes. The exception is Hungary where the shift to a flat-tax system substantially changed the income tax system affecting work incentives at the intensive and extensive margin.

Some countries furthermore experienced a substantial increase in the share of individuals with low work incentives.

Our analysis provides a description of the characteristics of these individuals. We apply an absolute threshold of 75% for short-term PTRs and 50% for long-term PTRs and METRs as it seems to be more appropriate for a cross-country comparative analysis. Results show that the share of individuals facing high short-term PTRs varies widely across countries from less than 5% up to 84%. The variation is also significant for long-term PTRs but varies on a smaller level between 3% and 40%. The same is true for METRs with the exception of Belgium, which is a clear outlier with 81% while other countries range between 1% and 34%. The portrait of those facing low long-term work incentives is similar to short-term PTRs in terms of individuals being more likely to be employees, middle-aged, main earners and low earners. However, contrary to the case of short-term PTRs, the largest share of people facing high long-term PTRs is made of men. The portrait of individuals facing low incentives at the intensive margin is very similar to the extensive margin but results by gender show greater variation and also results by earnings quintiles with high earners being the biggest group in a number of countries. In addition, differences between employees and self-employed are more pronounced in most of the countries.

Finally, our analysis exploits the advantages of microdata and compares work incentives across different population subgroups. In all countries, marked differences are observed between employed and self-employed, across earnings quintiles, and, to a minor extent, between age groups and type of earners. In particular, employees face on average higher short-term PTRs as the self-employed are not eligible to unemployment insurance in some countries. Employment status also plays a role in METRs due to different regimes in social insurance contributions for employees and the self-employed. Short-term PTRs are much higher for workers in the bottom vs. the top quintile of the earnings distribution in many countries. The variation across sub-groups decreases with longer unemployment duration in most countries and sometimes even points to different directions. Especially the difference between employed and self-employed vanishes when the access to unemployment insurance benefit is exhausted. The level of earnings constitutes some variation in METRs.

Providing a comparative and comprehensive analysis of work incentives across EU countries based on representative household data is a useful exercise, as it highlights the important differences in the distribution of work incentives associated to differences in tax-benefit systems. The characterisation of population subgroups facing low work incentives, provided in our analysis, can be considered a useful first step to discuss potential reforms to make work pay. From a technical point of view, a comparative analysis further provides a starting point to discuss what the most appropriate definition of low work incentive would be (i.e. setting a threshold, whether relative or absolute). Finally, the availability of work incentive indicators for a wide range of countries based on microdata would allow future work (re)assessing the relationship between the design of tax-benefit systems and labour market outcomes, such as employment and unemployment rates, female labour force participation, among others.

References

Adam, S., Brewer, M., and Shephard, A. (2006). "The poverty trade-off: work incentives and income redistribution in Britain", Bristol: The Policy Press.

- Bartels, C., and Pestel, N. (2016). "Short- and long-term participation tax rates and their impact on labor supply". *International Tax and Public Finance*, DOI 10.1007/s10797-016-9400-9.
- Bartels, C., and Shupe, C. (2018). "Drivers of Participation Elasticities across Europe: Gender or Earner Role within the Household?". IZA Discussion-Paper No. 11359.
- Cappellari, L., and Jenkins, S. P. (2014), "The Dynamics of Social Assistance Benefit Receipt in Britain", In Carcillo, S., Immervoll, H., Jenkins, S. P., Königs, S., and Tatsiramos, K., editors, *Research in Labor Economics: "Safety Nets and Benefit Dependence"*, Vol. 39, 41-79. Emerald Group Publishing Limited.
- Collado, D., Cantillon, B., Van den Bosch, K., Goedemé, T., and Vandelannoote, D. (2019). "The end of the cheap talk about poverty reduction: the cost of closing the poverty gap while maintaining work incentives", In Cantillon, B., Goedemé, T., and Hills, J., editors, *Decent Incomes for All: Improving Policies in Europe*, Oxford Scholarship Online, DOI: 10.1093/oso/9780190849696.001.0001.
- Decoster, A., Perelman, S., Vandelannoote, D., Vanheukelom, T., and Verbist, G. (2015). "A bird's eye view on 20 years of tax-benefit reforms in Belgium", EUROMOD Working Paper, EM 10/15.
- Fernandez Salgado M., Figari, F., Sutherland, H., and Tumino, A. (2014). "Welfare compensation for unemployment in the Great Recession". *Review of Income and Wealth*. DOI: 10.1111/roiw.12035.
- Figari, F., and Matsaganis, M. (2016). "Making work pay: A conceptual paper". Social Situation Monitor, Research Note 3/2016.
- Figari, F., Salvatori, A. & Sutherland, H. (2011). "Economic downturn and stress testing European welfare systems". In H. Immervoll, A. Peichl, & K. Tatsiramos, eds. *Who Loses in the Downturn? Economic Crisis, Employment and Income Distribution*. Emerald Group Publishing Limited, Research in Labor Economics 32, 257–286.
- Hansen, J., Lofstrom, M., Liu, X., and Zhang, X.. (2014), "State Dependence in Social Assistance Receipt in Canada", In Carcillo, S., Immervoll, H., Jenkins, S. P., Königs, S., and Tatsiramos, K., editors, *Research in Labor Economics: "Safety Nets and Benefit Dependence"*, Vol. 39, 81-105, Emerald Group Publishing Limited.
- Immervoll, H. (2004). "Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors", OECD Social, Employment and Migration Working Paper No. 19, OECD: Paris.
- Immervoll, H., Kleven, H., Kreiner, C., & Saez, E. (2007). "Welfare reform in European countries: A microsimulation analysis". *The Economic Journal*, 117, 1–44.
- Immervoll, H., Kleven, H., Kreiner, C. and Verdellin, N. (2011). "Optimal tax and transfer programs for couples with extensive labor supply responses", *Journal of Public Economics*, 95: 1485-1500.
- Jara, H.X., Sutherland, H. and Tumino, A. (2016) "The role of an EMU unemployment insurance scheme on income protection in case of unemployment." EUROMOD Working Paper Series EM11/16.
- Jara, H. X. and Tumino, A. (2013) "Tax-benefit systems, income distribution and work incentives in the European Union". *International Journal of Microsimulation*, 6(1), 27-62.
- Königs, S. (2014), State Dependence in Social Assistance Benefit Receipt in Germany before and after the Hartz Reforms, In Carcillo, S., Immervoll, H., Jenkins, S. P., Königs, S., and Tatsiramos, K., editors, *Research in Labor Economics: "Safety Nets and Benefit Dependence"*, Vol. 39, Emerald Group Publishing Limited, pp. 107-150.
- Lalive, Rafael. (2007) "Unemployment Benefits, Unemployment Duration, and Post-Unemployment Jobs: A Regression Discontinuity Approach." *The American Economic Review*, vol. 97, no. 2, pp. 108–112.
- Navickė, J., Avram, S., and Demmou, L. (2016) "The effects of reform scenarios for unemployment benefits and social assistance on work incentives and poverty in Lithuania", OECD, Economics Department Working Papers No. 1310.
- O'Donoghue, C. (2011). "Do tax-benefit systems cause high replacement rates? A decomposition analysis using EUROMOD". *LABOUR*, 25(1), 126-151.
- OECD (2016). "Tax and Benefit Systems: OECD Indicators", <http://www.oecd.org/els/benefits-and-wages.htm>
- Pirttillä, J., & Selin, H. (2011). "Tax policy and employment: How does the Swedish system fare". CESifo Working Paper Series No. 3355.
- Sutherland, H., and Figari, F. (2013). "EUROMOD: the European Union tax-benefit microsimulation model". *International Journal of Microsimulation*, 6(1), 4-26.

Appendix A. Simulating transitions from work to unemployment with EUROMOD

The approach used in this paper to calculate Participation Tax Rates (PTRs) consists in simulating transitions from work (employment or self-employment) into unemployment for all individuals with positive earnings in the microdata, and re-calculating their new household disposable income by means of the microsimulation model EUROMOD, hence capturing the implications of tax and benefit systems under their new labour market status.

More precisely, we make use of EUROMOD to run two iterations in the tax-benefit system of each country. In the first iteration, EUROMOD simulates tax-benefit instruments and calculates household disposable income without making any changes to the input data. In the second iteration, we simulate transitions to unemployment by setting earnings to zero and adjusting the value of other labour market related variables⁶ for all earners in the input data, and use EUROMOD to recalculate household disposable income under this counterfactual scenario where earners would become unemployed.⁷

In the case of households with multiple earners, household disposable income in unemployment – calculated in the second iteration – is simulated for each earner in turn. Consider for instance a dual earner household. First, household disposable income is simulated before any transitions to unemployment take place (first iteration). Then, we simulate a transition to unemployment for the first earner of the household (by setting her earnings to zero) and calculate household disposable income in case the first earner would become unemployed, keeping the labour market status of the second earner unchanged (second iteration for first earner). Finally, we simulate a transition to unemployment for the second earner and calculate household disposable income in case the second earner would enter unemployment, keeping the original labour market status of the first earner unchanged (i.e. first earner in work) (second iteration for second earner).

Once household disposable income in work and in unemployment have been calculated for each earner in the household, the PTR for each earner i in household h can be expressed as:

$$PTR_i = 1 - \frac{Y_h^{W_i} - Y_h^{U_i}}{E_i},$$

where E_i represents gross earnings of individual i when she is in work, $Y_h^{W_i}$ represents household disposable income when individual i is in work (W_i), and $Y_h^{U_i}$ represent household disposable income when individual i is in unemployment (U_i).

Two sets of PTR indicators are presented in the analysis: short-term and long-term PTRs. Short-term PTRs are calculated based on disposable income out of work over the first year of unemployment, meaning that unemployment insurance benefits are taken into account for those individuals eligible for these schemes. Long-term PTRs are calculated based on disposable income out of work assuming that entitlement to unemployment insurance benefits has been exhausted, with social assistance

⁶ Months in employment are set to zero, labour market status is set to unemployed, hours of work are set to zero, sector of employment (public or private) is set to zero and firm size is set to zero.

⁷ In countries where individuals in the data are observed to receive both unemployment benefits and earnings at the same time, an intermediate iteration is made, where the add-on runs the model after setting unemployment benefits in the data to zero. This is done to avoid having results which mix information on unemployment benefits from two different approaches: reported unemployment benefits and simulated unemployment benefits. The idea behind this intermediate step is to simulate unemployment benefits only for the corresponding period in which the person was in work. In practice, this step affects only a very limited number of observations.

most likely playing a larger role and taking into account entitlement to unemployment assistance, in countries where such schemes are available.

A few assumptions are needed in the simulation of transitions into unemployment to calculate PTRs for those currently in work. First, the number of months in unemployment needs to be specified. Here, unemployment duration is assumed to be equal to months in work during the year before the simulated transition (as reported in the data). This assumption is made in order to compare disposable income in and out of work over the same period of time. Second, in order to simulate unemployment insurance benefits, information about contribution history needs to be provided. Here, we exploit information available in the data and we set the number of months of contributions equal to the number of months in work before the transition, which is recorded over the last 12 months. For instance, in order to be eligible to unemployment insurance in Bulgaria, an individual is required to have contributed 9 out of 15 months, while in Germany it is required to have contributed 12 out of 24 months. In our simulations we would consider a person in the data eligible if she has worked 9 out of 12 months before transition to unemployment in Bulgaria; and 12 out of 12 months in Germany (given that month by month employment information is available for the previous year only). For countries where the qualifying period goes beyond 12 months, for instance Lithuania where it is required to contribute 18 out of 36 months, we use information about working history since entering the labour market as an additional control.

Appendix B. Tables and Figures

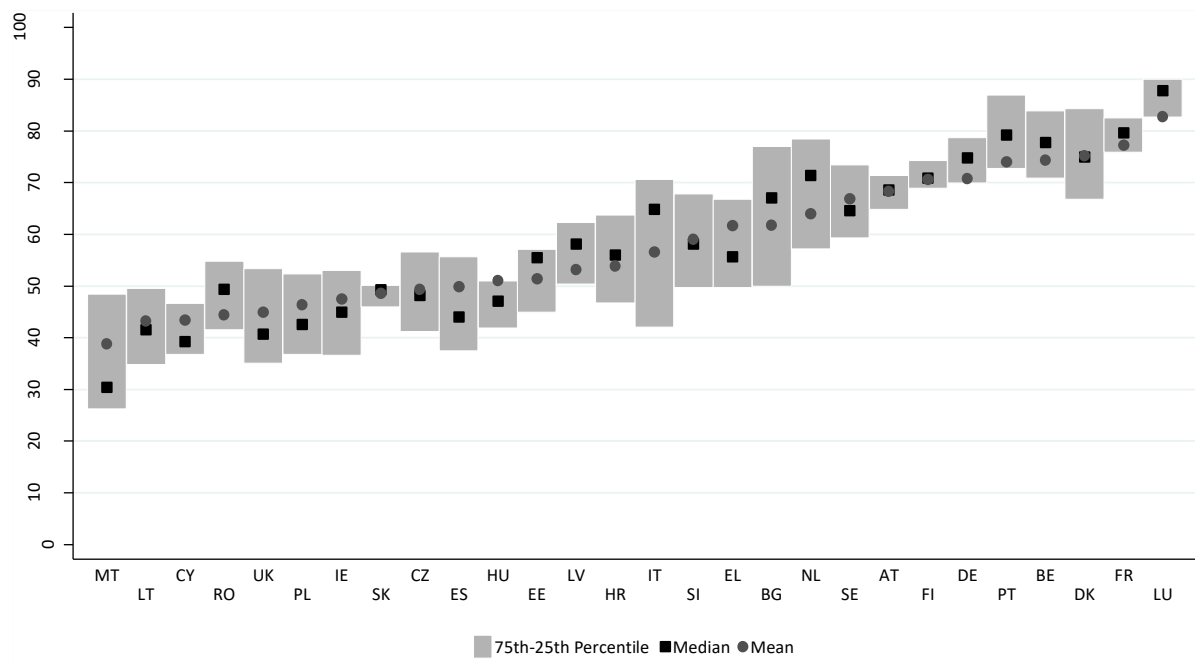
Table A1: Sample characteristics

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|-----------------------|------|------|------|------|-------|------|------|-------|-------|-------|------|-------|------|------|------|------|------|------|-------|------|-------|------|------|-------|------|-------|------|-------|
| N. of observations | 5317 | 4617 | 7470 | 6452 | 10881 | 6264 | 4685 | 10599 | 11718 | 10258 | 5391 | 15926 | 4699 | 5652 | 4367 | 3915 | 7181 | 4387 | 10903 | 5701 | 11085 | 7910 | 6640 | 10611 | 6798 | 11892 | 6202 | 16654 |
| Population (1,000) | 4336 | 3027 | 4649 | 2400 | 34800 | 609 | 1709 | 3487 | 17768 | 25273 | 1447 | 22236 | 365 | 871 | 1241 | 230 | 4098 | 173 | 7309 | 3779 | 13397 | 4027 | 8004 | 827 | 2389 | 2300 | 4482 | 25794 |
| % female | 46.3 | 47.1 | 44.5 | 48.0 | 48.8 | 49.9 | 47.2 | 41.6 | 45.2 | 48.9 | 44.8 | 42.1 | 49.3 | 50.4 | 48.3 | 46.8 | 46.7 | 39.3 | 46.3 | 45.1 | 46.0 | 49.9 | 41.3 | 44.3 | 45.7 | 49.7 | 48.4 | 47.5 |
| % age (<30) | 16.8 | 16.1 | 15.9 | 14.7 | 15.3 | 20.9 | 15.7 | 12.2 | 11.8 | 19.3 | 19.2 | 12.1 | 22.8 | 19.3 | 19.4 | 20.1 | 17.4 | 26.9 | 18.8 | 21.7 | 18.9 | 15.6 | 15.4 | 13.7 | 19.4 | 18.1 | 18.5 | 22.5 |
| % age (30-50) | 59.3 | 56.7 | 59.5 | 55.6 | 55.6 | 51.1 | 58.8 | 65.3 | 64.4 | 58.0 | 57.6 | 60.7 | 56.5 | 52.2 | 51.4 | 62.1 | 54.7 | 51.5 | 53.4 | 53.4 | 57.8 | 61.3 | 63.6 | 65.6 | 57.9 | 52.0 | 52.8 | 52.2 |
| % age (50+) | 23.9 | 27.3 | 24.6 | 29.6 | 29.1 | 28.0 | 25.5 | 22.6 | 23.8 | 22.8 | 23.3 | 27.2 | 20.7 | 28.6 | 29.1 | 17.8 | 27.9 | 21.6 | 27.8 | 24.8 | 23.3 | 23.1 | 21.1 | 20.7 | 22.6 | 29.9 | 28.7 | 25.3 |
| % low-skilled | 12.4 | 13.2 | 3.3 | 15.3 | 6.3 | 11.3 | 15.3 | 20.8 | 33.5 | 12.7 | 10.0 | 29.5 | 15.8 | 9.2 | 4.8 | 29.7 | 11.8 | 42.4 | 18.1 | 11.5 | 5.6 | 49.8 | 27.6 | 9.3 | 2.5 | 11.1 | 10.2 | 45.5 |
| % medium-skilled | 37.9 | 58.0 | 74.5 | 44.7 | 55.2 | 46.8 | 29.4 | 42.3 | 23.9 | 47.7 | 66.4 | 46.0 | 42.0 | 55.8 | 54.1 | 39.0 | 59.6 | 29.3 | 41.1 | 55.2 | 61.1 | 26.2 | 51.2 | 56.9 | 72.3 | 44.8 | 46.3 | 25.8 |
| % high-skilled | 49.7 | 28.8 | 22.2 | 40.0 | 38.4 | 41.9 | 55.3 | 37.0 | 42.6 | 39.6 | 23.6 | 24.5 | 42.2 | 35.0 | 41.1 | 31.2 | 28.6 | 28.3 | 40.9 | 33.3 | 33.3 | 24.1 | 21.1 | 33.8 | 25.2 | 44.1 | 43.5 | 28.6 |
| % employee | 91.1 | 91.5 | 84.0 | 95.9 | 94.7 | 99.0 | 88.1 | 69.1 | 90.1 | 94.9 | 90.5 | 77.2 | 89.8 | 96.2 | 94.9 | 95.6 | 92.8 | 91.0 | 91.5 | 90.9 | 87.7 | 93.3 | 77.7 | 90.8 | 87.4 | 95.1 | 98.0 | 88.1 |
| % self-employed | 8.9 | 8.5 | 16.0 | 4.1 | 5.3 | 1.0 | 11.9 | 30.9 | 9.9 | 5.1 | 9.5 | 19.0 | 10.2 | 3.8 | 5.1 | 4.4 | 7.2 | 9.0 | 8.5 | 9.1 | 12.3 | 6.7 | 22.3 | 9.2 | 12.6 | 4.9 | 2.0 | 11.9 |
| % main earner | 64.9 | 60.4 | 60.6 | 65.3 | 67.4 | 62.2 | 60.1 | 69.7 | 65.9 | 64.9 | 61.0 | 67.9 | 61.4 | 60.3 | 61.7 | 63.0 | 62.9 | 58.4 | 63.8 | 62.5 | 59.3 | 62.4 | 61.5 | 60.7 | 54.0 | 65.5 | 64.0 | 62.0 |
| % secondary earner | 35.1 | 39.6 | 39.4 | 34.7 | 32.6 | 37.8 | 39.9 | 30.3 | 34.1 | 35.1 | 39.0 | 32.1 | 38.6 | 39.7 | 38.3 | 37.0 | 37.1 | 41.6 | 36.2 | 37.5 | 40.7 | 37.6 | 38.5 | 39.3 | 46.0 | 34.5 | 36.0 | 38.0 |
| % part-time | 15.1 | 5.9 | 4.6 | 10.6 | 17.8 | 8.1 | 27.3 | 15.5 | 18.8 | 13.3 | 5.0 | 15.6 | 15.9 | 9.6 | 7.0 | 17.3 | 8.1 | 8.2 | 30.2 | 18.3 | 7.1 | 6.5 | 3.9 | 7.3 | 3.4 | 11.7 | 8.2 | 19.6 |
| Average working hours | 38.2 | 41.0 | 41.8 | 38.1 | 37.8 | 40.3 | 35.1 | 41.6 | 38.1 | 38.0 | 41.1 | 37.4 | 37.7 | 39.6 | 39.4 | 38.3 | 39.3 | 39.9 | 33.1 | 38.3 | 41.8 | 41.4 | 40.7 | 40.3 | 41.2 | 39.5 | 39.7 | 36.5 |

Note: "low-skilled" refers to lower secondary education or less, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income. "Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

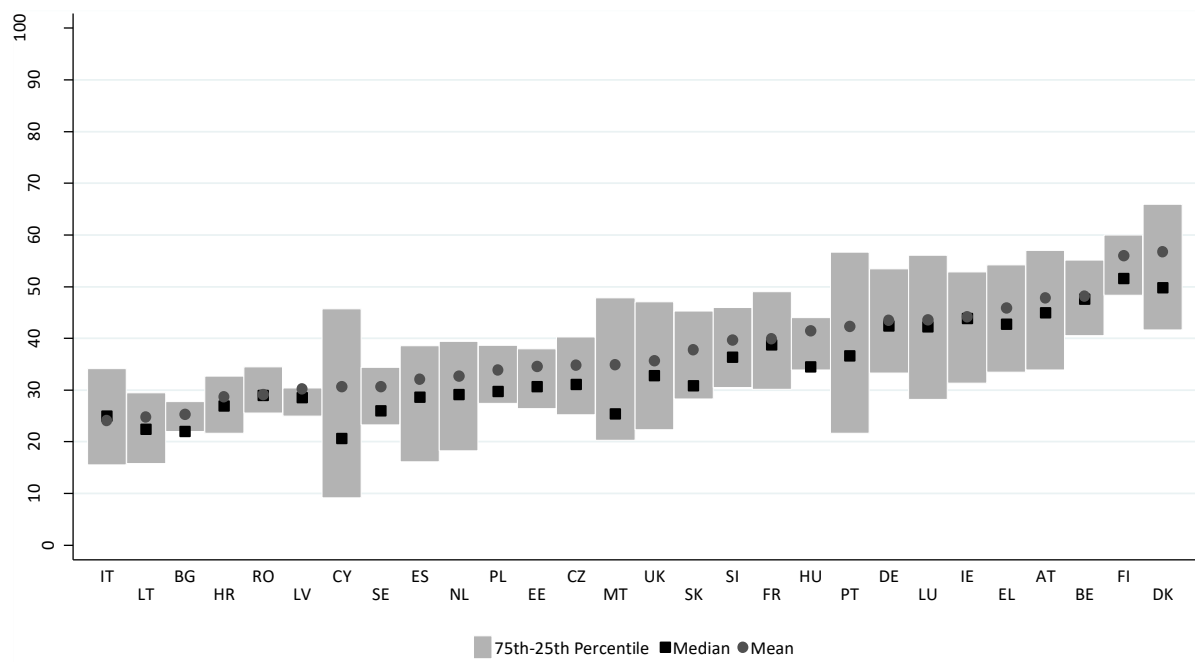
Figure A1: Distribution of short-term PTRs in 2017



Note: countries ranked by mean short-term PTRs.

Source: own calculations using EUROMOD version H1.0.

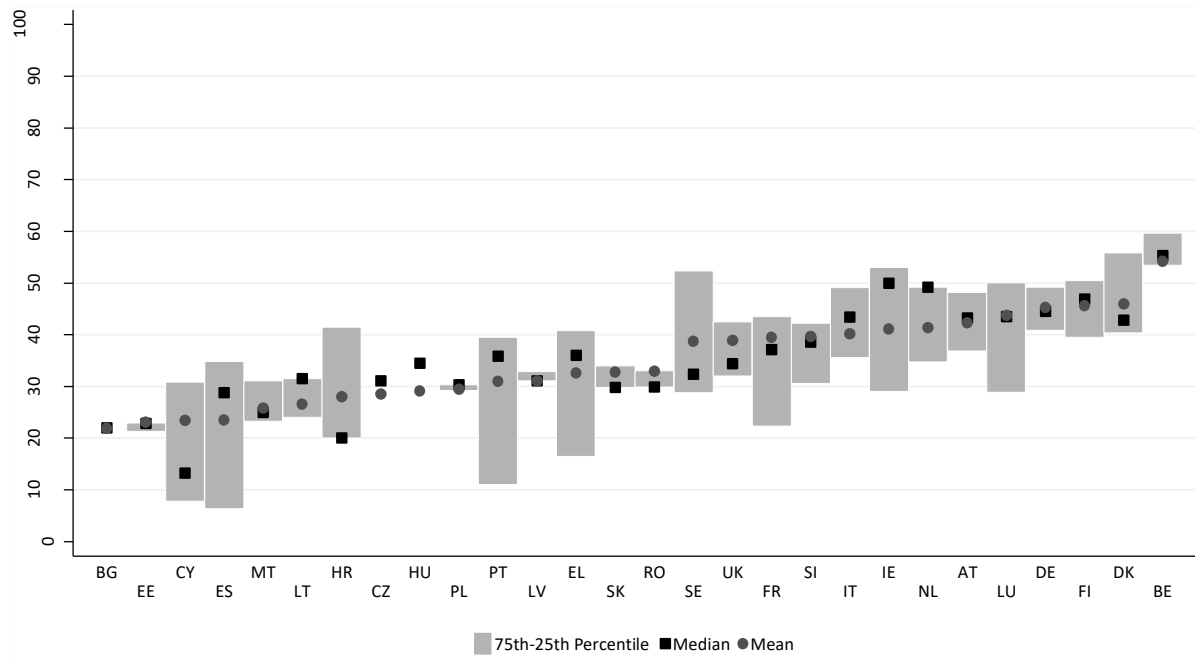
Figure A2: Distribution of long-term PTRs in 2017



Note: countries ranked by mean long-term PTRs.

Source: own calculations using EUROMOD version H1.0.

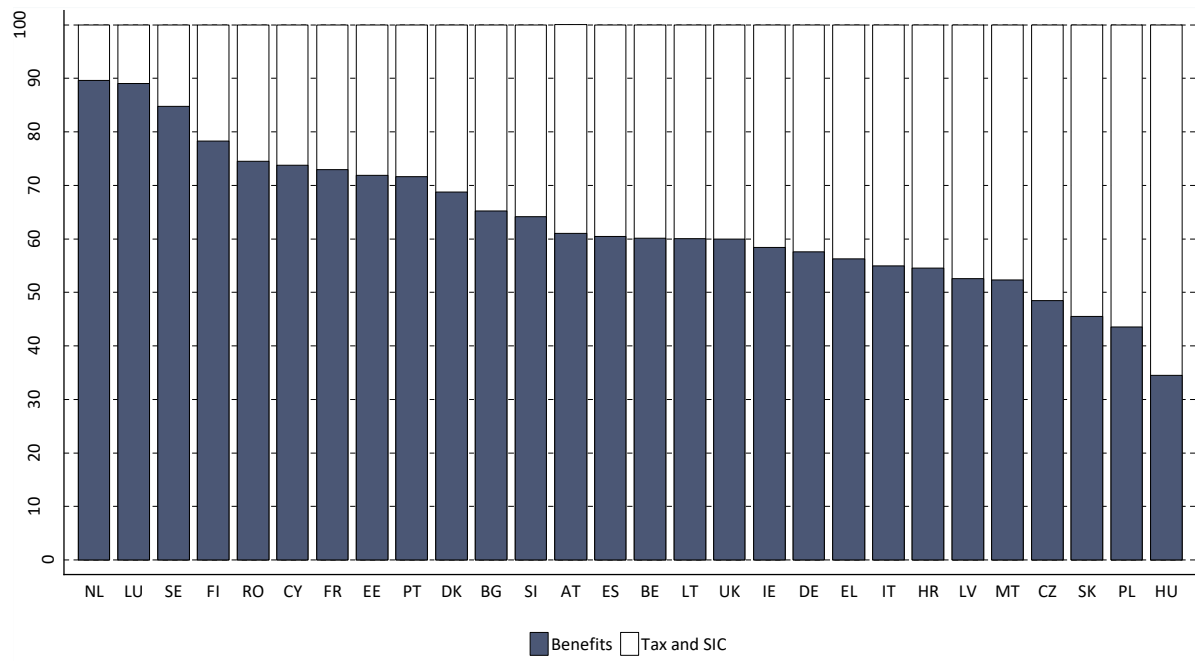
Figure A3: Distribution of METRs in 2017



Note: countries ranked by mean METR.

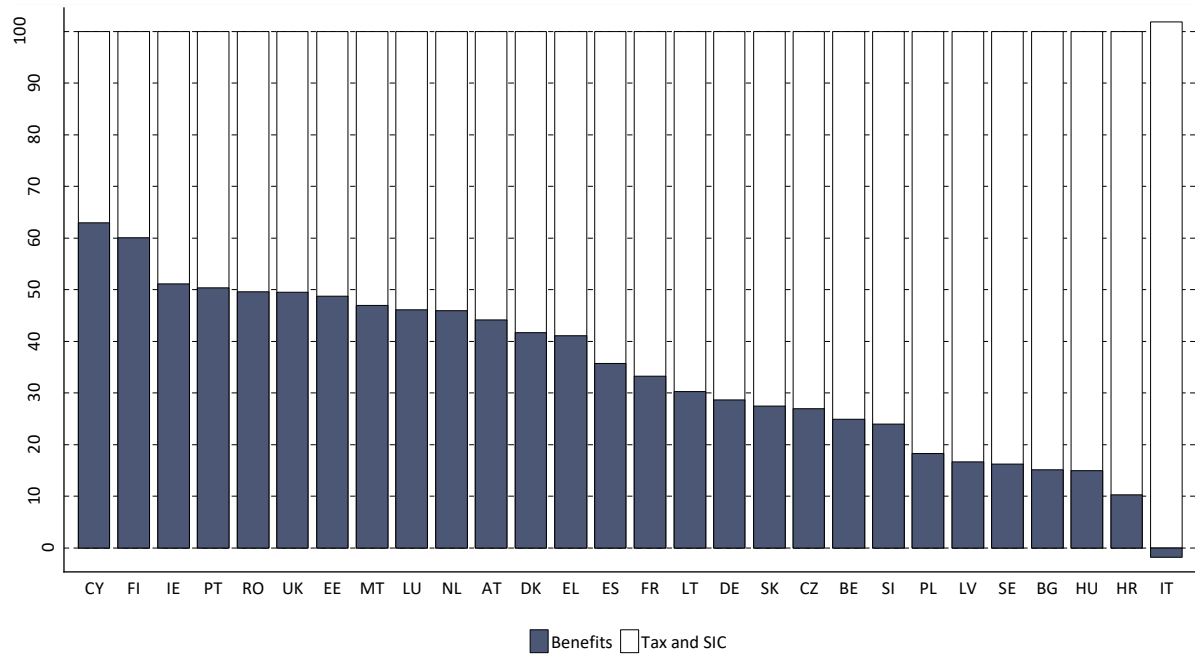
Source: own calculations using EUROMOD version H1.0.

Figure A4: Relative contribution of benefits vs. income taxes and SIC to mean short-term PTRs in 2017



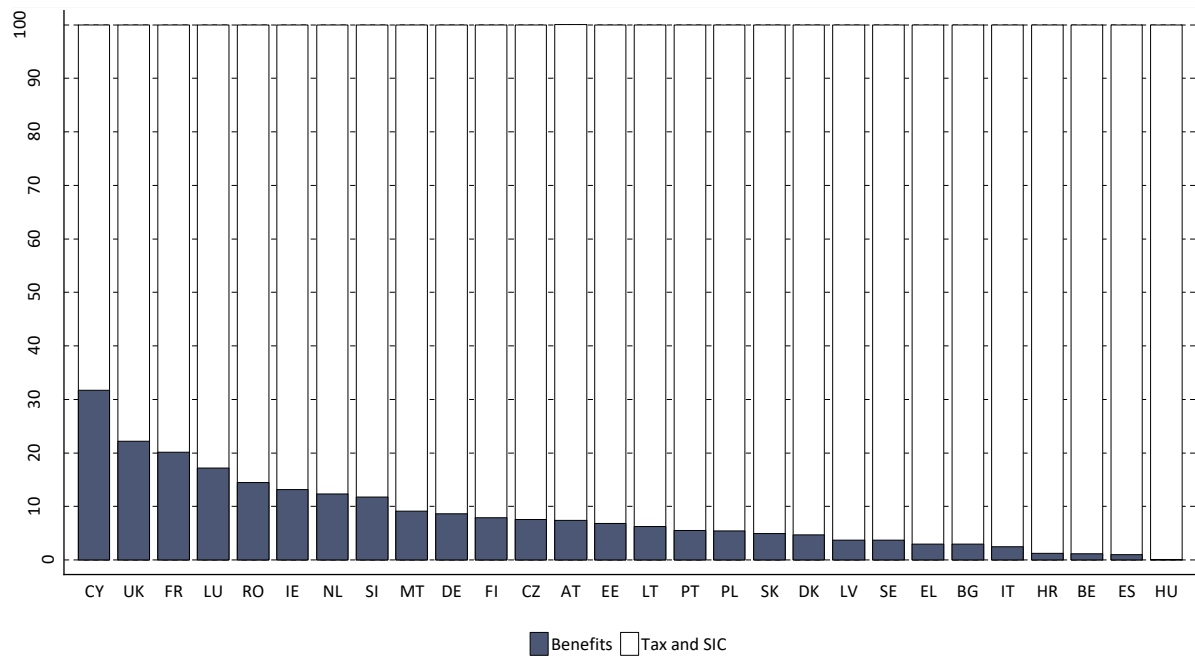
Source: own calculations using EUROMOD version H1.0.

Figure A5: Relative contribution of benefits vs. income taxes and SIC to mean long-term PTRs in 2017



Source: own calculations using EUROMOD version H1.0.

Figure A6: Relative contribution of benefits vs. income taxes and SIC to mean METRs in 2017



Source: own calculations using EUROMOD version H1.0.

Table A2: Mean short-term PTRs by population subgroups in 2017, %

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| All | 74.3 | 61.8 | 49.4 | 75.2 | 70.8 | 51.4 | 47.5 | 61.7 | 49.8 | 77.3 | 53.9 | 56.6 | 43.4 | 53.2 | 43.3 | 82.8 | 51.1 | 38.8 | 64.0 | 68.3 | 46.4 | 74.0 | 44.4 | 59.0 | 48.6 | 70.6 | 66.9 | 45.0 |
| Male | 72.7 | 60.7 | 48.8 | 72.8 | 72.5 | 51.1 | 46.6 | 60.7 | 49.5 | 76.9 | 53.2 | 54.3 | 44.1 | 53.3 | 43.2 | 82.0 | 51.1 | 39.2 | 65.9 | 67.3 | 46.1 | 72.1 | 45.3 | 58.8 | 49.7 | 70.6 | 66.0 | 44.9 |
| female | 76.2 | 63.0 | 50.0 | 77.9 | 69.0 | 51.7 | 48.6 | 63.2 | 50.3 | 77.7 | 54.8 | 59.8 | 42.7 | 53.0 | 43.3 | 83.7 | 51.1 | 38.3 | 61.8 | 69.5 | 46.8 | 76.0 | 43.2 | 59.3 | 47.3 | 70.7 | 67.8 | 45.1 |
| age (<30) | 77.4 | 49.5 | 43.8 | 68.2 | 68.8 | 46.6 | 42.8 | 70.3 | 51.7 | 75.8 | 42.1 | 50.7 | 38.5 | 47.7 | 42.5 | 72.6 | 53.8 | 48.5 | 51.1 | 68.1 | 41.8 | 64.5 | 42.7 | 42.4 | 43.0 | 70.5 | 67.3 | 40.2 |
| age (30-50) | 73.8 | 64.4 | 47.6 | 76.1 | 71.6 | 53.8 | 47.6 | 61.5 | 49.9 | 77.5 | 56.8 | 56.2 | 45.5 | 54.5 | 42.8 | 85.6 | 47.2 | 35.2 | 66.5 | 69.9 | 45.9 | 76.5 | 44.6 | 60.0 | 50.2 | 70.9 | 66.9 | 48.0 |
| age (50+) | 73.6 | 63.5 | 57.3 | 77.1 | 70.4 | 50.6 | 50.3 | 57.8 | 48.9 | 78.0 | 56.5 | 60.1 | 43.1 | 54.5 | 44.6 | 84.5 | 57.0 | 35.5 | 67.8 | 65.1 | 51.4 | 73.9 | 45.0 | 67.3 | 49.2 | 70.2 | 66.6 | 43.0 |
| low-skilled | 77.6 | 59.4 | 49.7 | 72.8 | 69.2 | 51.0 | 49.5 | 65.1 | 53.6 | 78.9 | 59.8 | 54.5 | 49.6 | 50.3 | 48.8 | 84.5 | 53.2 | 41.4 | 64.7 | 74.2 | 51.9 | 75.5 | 41.1 | 64.6 | 48.8 | 71.7 | 70.9 | 46.3 |
| medium-skilled | 75.3 | 62.8 | 50.0 | 77.5 | 71.0 | 52.7 | 47.9 | 63.2 | 50.6 | 77.2 | 54.7 | 57.4 | 45.0 | 52.5 | 45.4 | 83.0 | 52.0 | 39.0 | 64.1 | 69.2 | 48.0 | 73.3 | 46.0 | 59.9 | 48.8 | 70.7 | 67.6 | 43.9 |
| high-skilled | 72.8 | 60.9 | 47.1 | 73.7 | 70.8 | 50.0 | 46.8 | 58.1 | 46.5 | 76.7 | 49.1 | 57.6 | 39.5 | 55.0 | 39.8 | 81.0 | 48.4 | 34.9 | 63.5 | 64.7 | 42.6 | 71.6 | 45.0 | 56.1 | 48.0 | 70.3 | 65.2 | 43.9 |
| employee | 76.5 | 64.2 | 47.2 | 75.1 | 72.4 | 51.2 | 47.2 | 63.1 | 48.7 | 78.9 | 53.8 | 64.2 | 44.0 | 54.2 | 43.7 | 82.3 | 48.3 | 38.8 | 68.1 | 70.0 | 45.4 | 76.1 | 50.1 | 57.4 | 46.3 | 70.6 | 66.3 | 46.2 |
| self-employed | 51.9 | 35.9 | 60.9 | 78.3 | 41.9 | 66.8 | 50.3 | 58.6 | 60.4 | 47.2 | 54.9 | 35.4 | 38.2 | 27.9 | 35.0 | 94.7 | 87.6 | 39.4 | 19.7 | 51.6 | 53.4 | 45.5 | 24.8 | 74.8 | 64.8 | 71.4 | 94.8 | 36.0 |
| main earner | 74.4 | 64.3 | 49.7 | 73.1 | 72.2 | 52.9 | 50.1 | 60.0 | 50.7 | 77.3 | 54.5 | 56.8 | 46.5 | 56.1 | 43.0 | 85.1 | 49.5 | 36.8 | 68.4 | 69.7 | 45.7 | 75.6 | 46.7 | 59.1 | 50.6 | 71.6 | 65.7 | 48.1 |
| secondary earner | 74.2 | 58.0 | 48.9 | 79.2 | 67.9 | 48.8 | 43.6 | 65.7 | 48.3 | 77.1 | 52.9 | 56.2 | 38.4 | 48.8 | 43.7 | 79.0 | 53.7 | 41.8 | 56.3 | 66.1 | 47.5 | 71.4 | 40.8 | 59.0 | 46.3 | 68.8 | 69.0 | 39.8 |
| part-timer | 80.2 | 54.3 | 51.3 | 80.1 | 61.4 | 50.7 | 51.1 | 81.2 | 57.6 | 77.3 | 51.2 | 46.5 | 40.7 | 43.6 | 47.7 | 81.4 | 63.6 | 48.7 | 62.2 | 73.1 | 49.3 | 68.6 | 34.6 | 63.6 | 47.5 | 72.8 | 63.0 | 49.1 |
| earnings Q1 | 71.4 | 47.4 | 52.7 | 80.5 | 57.8 | 56.2 | 54.6 | 87.1 | 73.1 | 72.0 | 46.2 | 39.1 | 39.9 | 38.8 | 54.6 | 73.3 | 64.0 | 57.0 | 53.0 | 70.9 | 55.1 | 63.4 | 29.4 | 64.9 | 49.1 | 70.1 | 76.0 | 50.1 |
| earnings Q2 | 75.8 | 63.2 | 49.7 | 81.0 | 70.6 | 50.7 | 46.7 | 62.7 | 55.1 | 79.9 | 58.5 | 52.9 | 51.2 | 53.0 | 44.0 | 86.2 | 51.2 | 41.0 | 57.1 | 72.4 | 51.4 | 73.8 | 49.5 | 57.4 | 47.4 | 70.6 | 72.4 | 43.9 |
| earnings Q3 | 79.5 | 65.1 | 49.4 | 76.2 | 73.4 | 49.8 | 43.8 | 56.7 | 46.5 | 78.2 | 60.0 | 60.6 | 45.5 | 55.4 | 44.6 | 86.8 | 49.8 | 36.7 | 63.1 | 67.5 | 46.8 | 76.4 | 49.8 | 60.9 | 48.3 | 71.5 | 66.9 | 44.3 |
| earnings Q4 | 75.3 | 65.1 | 49.6 | 72.2 | 75.3 | 51.6 | 45.0 | 53.4 | 44.2 | 77.9 | 53.9 | 63.8 | 40.4 | 57.4 | 41.9 | 88.3 | 48.4 | 32.7 | 70.9 | 67.9 | 42.7 | 82.8 | 48.1 | 58.6 | 48.8 | 71.4 | 61.4 | 43.4 |
| earnings Q5 | 69.3 | 62.6 | 45.9 | 66.8 | 74.6 | 49.6 | 48.6 | 50.4 | 40.3 | 76.7 | 48.6 | 60.3 | 39.4 | 57.6 | 34.6 | 78.9 | 45.0 | 30.4 | 72.9 | 63.6 | 37.6 | 72.7 | 44.3 | 54.8 | 49.4 | 69.3 | 59.4 | 43.7 |

Note: "Low-skilled" refers to lower secondary education or less, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income."Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A3: Mean long-term PTRs by population subgroups in 2017, %

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| all | 48.1 | 25.3 | 34.8 | 56.8 | 43.5 | 34.5 | 44.2 | 45.8 | 32.1 | 39.9 | 28.7 | 24.1 | 30.7 | 30.2 | 24.8 | 43.6 | 41.5 | 34.9 | 32.7 | 47.8 | 33.9 | 42.3 | 29.1 | 39.6 | 37.8 | 56.0 | 30.7 | 35.7 |
| male | 48.9 | 25.4 | 34.9 | 57.7 | 46.0 | 34.4 | 46.7 | 47.8 | 33.3 | 41.6 | 28.4 | 24.6 | 33.2 | 30.2 | 26.1 | 45.7 | 41.6 | 36.2 | 36.5 | 51.3 | 33.7 | 43.1 | 31.0 | 40.5 | 39.7 | 56.0 | 32.8 | 39.3 |
| female | 47.3 | 25.2 | 34.8 | 55.8 | 41.0 | 34.7 | 41.3 | 43.0 | 30.8 | 38.2 | 29.1 | 23.5 | 28.1 | 30.3 | 23.4 | 41.3 | 41.3 | 32.8 | 28.3 | 43.5 | 34.1 | 41.5 | 26.5 | 38.6 | 35.6 | 56.0 | 28.4 | 31.8 |
| age (<30) | 50.6 | 24.7 | 32.5 | 65.8 | 46.8 | 35.0 | 47.2 | 50.1 | 23.7 | 36.8 | 27.8 | 19.7 | 25.0 | 28.9 | 27.8 | 33.1 | 50.5 | 45.6 | 37.4 | 53.9 | 30.6 | 35.4 | 34.8 | 36.8 | 36.5 | 59.2 | 27.4 | 34.1 |
| age (30-50) | 47.2 | 26.2 | 35.8 | 57.2 | 43.3 | 35.0 | 43.5 | 44.5 | 32.9 | 41.0 | 29.1 | 23.6 | 32.2 | 30.3 | 25.2 | 46.0 | 39.1 | 30.6 | 30.1 | 47.4 | 36.0 | 43.8 | 28.0 | 40.8 | 38.9 | 55.6 | 31.5 | 37.8 |
| age (50+) | 48.9 | 23.9 | 34.0 | 51.6 | 42.4 | 33.4 | 43.9 | 47.3 | 34.4 | 39.8 | 28.7 | 27.3 | 32.7 | 31.0 | 22.0 | 47.2 | 40.6 | 31.7 | 34.5 | 43.3 | 31.4 | 43.1 | 28.1 | 37.9 | 36.3 | 54.7 | 31.3 | 32.9 |
| low-skilled | 48.3 | 33.1 | 34.8 | 59.5 | 48.1 | 37.7 | 45.7 | 52.5 | 33.8 | 41.3 | 26.9 | 19.7 | 41.3 | 31.8 | 34.8 | 46.4 | 43.3 | 36.7 | 36.5 | 52.1 | 35.3 | 46.3 | 30.1 | 39.6 | 37.5 | 59.8 | 32.9 | 35.9 |
| medium-skilled | 47.0 | 24.7 | 35.0 | 57.9 | 44.1 | 36.5 | 44.8 | 46.1 | 31.9 | 40.9 | 28.0 | 24.0 | 31.8 | 30.3 | 24.5 | 41.1 | 41.7 | 35.1 | 33.2 | 47.2 | 34.1 | 39.0 | 28.2 | 39.5 | 37.9 | 57.2 | 30.1 | 35.2 |
| high-skilled | 49.0 | 23.0 | 34.1 | 54.5 | 42.0 | 31.5 | 43.4 | 41.8 | 31.0 | 38.2 | 31.6 | 29.7 | 25.6 | 29.8 | 24.0 | 44.2 | 40.3 | 31.9 | 30.5 | 47.2 | 33.3 | 37.7 | 30.0 | 39.9 | 37.6 | 53.8 | 30.8 | 36.0 |
| employee | 47.8 | 24.3 | 32.3 | 56.7 | 43.6 | 34.2 | 43.3 | 40.1 | 29.0 | 39.5 | 28.2 | 22.2 | 29.8 | 30.3 | 24.2 | 43.2 | 39.0 | 34.4 | 33.9 | 47.4 | 34.0 | 42.1 | 30.3 | 39.0 | 33.9 | 55.2 | 30.2 | 35.7 |
| self-employed | 51.9 | 35.9 | 48.2 | 59.4 | 41.9 | 66.8 | 50.3 | 58.6 | 60.4 | 47.2 | 33.3 | 35.3 | 38.2 | 27.9 | 35.0 | 51.8 | 72.8 | 39.4 | 19.7 | 51.6 | 33.0 | 45.5 | 24.8 | 45.7 | 64.8 | 70.7 | 55.5 | 36.0 |
| main earner | 50.4 | 26.6 | 36.4 | 58.3 | 45.5 | 36.1 | 47.8 | 47.5 | 34.8 | 42.1 | 29.0 | 23.9 | 36.9 | 33.4 | 28.0 | 50.6 | 39.9 | 34.0 | 38.0 | 54.2 | 34.3 | 49.8 | 31.6 | 42.2 | 41.2 | 57.6 | 34.8 | 42.5 |
| secondary earner | 44.0 | 23.3 | 32.3 | 53.9 | 39.4 | 32.0 | 38.6 | 41.9 | 26.9 | 35.9 | 28.3 | 24.6 | 20.7 | 25.4 | 19.6 | 31.7 | 44.2 | 36.2 | 23.3 | 37.1 | 33.3 | 30.0 | 25.2 | 35.7 | 33.9 | 53.0 | 23.5 | 24.7 |
| part-timer | 46.7 | 36.2 | 41.6 | 66.2 | 36.0 | 38.4 | 44.1 | 52.5 | 34.7 | 36.7 | 30.6 | 13.7 | 31.2 | 29.7 | 27.8 | 39.8 | 53.3 | 37.5 | 30.2 | 42.7 | 34.3 | 46.7 | 31.8 | 42.8 | 39.8 | 65.2 | 28.6 | 30.5 |
| earnings Q1 | 48.4 | 33.2 | 41.9 | 74.4 | 39.3 | 46.0 | 50.3 | 63.3 | 48.8 | 34.2 | 29.3 | 16.4 | 32.9 | 30.3 | 31.9 | 36.9 | 54.7 | 48.8 | 38.3 | 55.2 | 33.8 | 47.0 | 27.5 | 43.2 | 42.5 | 65.8 | 28.5 | 31.6 |
| earnings Q2 | 45.3 | 25.2 | 33.4 | 56.7 | 46.6 | 38.5 | 42.0 | 43.4 | 33.4 | 42.1 | 26.6 | 16.1 | 37.0 | 30.4 | 20.5 | 45.8 | 41.5 | 36.9 | 28.6 | 46.9 | 35.4 | 45.9 | 27.6 | 39.0 | 35.1 | 57.1 | 29.9 | 33.4 |
| earnings Q3 | 47.6 | 24.6 | 33.0 | 53.7 | 44.0 | 33.1 | 39.5 | 40.3 | 27.0 | 42.2 | 26.5 | 21.0 | 30.7 | 30.0 | 23.2 | 46.3 | 38.7 | 33.5 | 29.3 | 47.0 | 34.7 | 39.6 | 29.5 | 38.5 | 37.0 | 53.6 | 28.9 | 36.7 |
| earnings Q4 | 48.4 | 23.3 | 33.1 | 50.4 | 43.9 | 30.3 | 42.6 | 40.5 | 27.5 | 40.1 | 28.7 | 27.2 | 26.0 | 30.2 | 24.8 | 42.9 | 37.7 | 29.6 | 31.9 | 45.9 | 33.5 | 38.2 | 30.2 | 37.9 | 37.1 | 52.6 | 29.0 | 37.0 |
| earnings Q5 | 51.0 | 23.4 | 33.4 | 50.6 | 43.2 | 27.2 | 47.2 | 43.0 | 30.8 | 39.2 | 32.7 | 36.4 | 27.4 | 30.3 | 25.6 | 46.0 | 37.8 | 28.4 | 36.6 | 45.9 | 32.2 | 41.5 | 30.5 | 40.5 | 37.9 | 53.0 | 36.8 | 39.5 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income. "Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A4: Mean METRs by population subgroups in 2017, %

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| all | 54.2 | 21.9 | 28.5 | 46.0 | 45.3 | 23.1 | 41.2 | 32.6 | 23.5 | 39.5 | 28.1 | 40.2 | 23.4 | 31.1 | 26.6 | 43.7 | 29.1 | 25.8 | 41.3 | 42.3 | 29.5 | 31.0 | 33.0 | 39.7 | 32.8 | 45.6 | 38.7 | 38.9 |
| male | 54.9 | 21.8 | 29.3 | 47.1 | 45.4 | 23.2 | 42.5 | 35.0 | 24.2 | 40.1 | 28.0 | 41.8 | 23.4 | 31.0 | 26.9 | 43.5 | 28.1 | 26.4 | 46.0 | 44.8 | 28.4 | 31.3 | 33.5 | 39.8 | 33.5 | 47.2 | 41.5 | 40.2 |
| female | 53.5 | 22.0 | 27.6 | 44.7 | 45.2 | 23.1 | 39.6 | 29.3 | 22.6 | 38.8 | 28.1 | 38.0 | 23.4 | 31.3 | 26.3 | 44.0 | 30.2 | 24.9 | 35.9 | 39.2 | 30.6 | 30.6 | 32.3 | 39.5 | 31.9 | 44.1 | 35.8 | 37.5 |
| age (<30) | 52.9 | 22.7 | 26.6 | 43.1 | 43.6 | 23.4 | 26.8 | 23.6 | 15.9 | 39.4 | 26.8 | 32.5 | 16.9 | 31.2 | 27.2 | 37.6 | 31.0 | 27.2 | 37.0 | 39.2 | 30.0 | 24.9 | 37.8 | 35.8 | 30.9 | 43.9 | 29.8 | 33.7 |
| age (30-50) | 54.6 | 22.0 | 29.1 | 46.7 | 45.7 | 23.3 | 44.4 | 33.5 | 23.8 | 39.1 | 27.9 | 40.9 | 25.3 | 31.0 | 25.8 | 44.8 | 27.3 | 25.5 | 42.3 | 42.7 | 30.0 | 32.3 | 31.8 | 40.4 | 33.6 | 46.1 | 40.5 | 42.1 |
| age (50+) | 54.3 | 21.1 | 28.3 | 46.2 | 45.6 | 22.5 | 42.4 | 35.0 | 26.4 | 40.5 | 29.6 | 42.0 | 25.3 | 31.2 | 27.7 | 46.9 | 31.4 | 24.9 | 42.4 | 44.0 | 27.6 | 31.6 | 33.1 | 39.9 | 32.3 | 45.8 | 41.1 | 36.9 |
| low-skilled | 53.0 | 26.2 | 29.2 | 44.4 | 47.9 | 23.1 | 39.2 | 27.0 | 17.9 | 42.5 | 22.4 | 36.5 | 28.3 | 32.2 | 28.5 | 41.8 | 30.4 | 24.9 | 38.4 | 40.2 | 28.6 | 27.0 | 36.4 | 40.0 | 32.4 | 43.4 | 36.8 | 39.4 |
| medium-skilled | 53.6 | 21.8 | 28.2 | 44.8 | 45.6 | 23.3 | 35.3 | 31.6 | 23.3 | 39.8 | 26.7 | 40.6 | 22.2 | 31.0 | 26.7 | 42.8 | 24.1 | 26.5 | 40.1 | 41.5 | 29.1 | 31.5 | 31.7 | 39.1 | 32.8 | 44.2 | 37.2 | 37.8 |
| high-skilled | 55.0 | 20.1 | 29.4 | 47.9 | 44.6 | 22.9 | 44.8 | 37.0 | 28.0 | 38.1 | 34.3 | 43.8 | 22.8 | 31.1 | 26.3 | 46.9 | 38.9 | 26.5 | 43.9 | 44.2 | 30.3 | 38.6 | 31.7 | 40.7 | 32.6 | 47.7 | 40.7 | 39.2 |
| employee | 54.7 | 21.1 | 29.2 | 46.1 | 45.4 | 23.0 | 41.4 | 31.4 | 24.3 | 39.0 | 30.0 | 41.3 | 23.2 | 31.5 | 26.8 | 43.4 | 29.6 | 25.8 | 42.3 | 41.7 | 31.9 | 31.8 | 32.1 | 41.2 | 30.6 | 45.6 | 38.2 | 39.1 |
| self-employed | 49.4 | 30.8 | 25.0 | 43.6 | 43.9 | 33.8 | 39.2 | 35.5 | 16.3 | 48.0 | 9.5 | 42.3 | 24.9 | 20.8 | 23.9 | 51.2 | 22.6 | 26.1 | 31.3 | 48.4 | 11.9 | 19.7 | 36.1 | 24.4 | 47.6 | 46.9 | 63.1 | 37.4 |
| main earner | 55.1 | 21.9 | 30.8 | 47.9 | 46.8 | 24.2 | 45.7 | 35.8 | 24.8 | 41.5 | 28.5 | 42.5 | 26.3 | 31.6 | 27.6 | 46.7 | 27.3 | 27.2 | 46.8 | 46.5 | 29.3 | 32.2 | 32.7 | 43.1 | 34.4 | 48.2 | 42.6 | 43.9 |
| secondary earner | 52.6 | 21.8 | 25.1 | 42.4 | 42.2 | 21.4 | 34.2 | 25.3 | 21.0 | 35.7 | 27.4 | 35.2 | 18.7 | 30.3 | 25.1 | 38.7 | 32.2 | 23.9 | 31.8 | 35.2 | 29.6 | 29.0 | 33.5 | 34.4 | 30.8 | 40.7 | 31.9 | 30.8 |
| part-timer | 48.6 | 30.4 | 14.9 | 41.7 | 43.7 | 22.7 | 32.0 | 21.6 | 12.9 | 42.5 | 19.4 | 21.1 | 25.9 | 30.3 | 25.5 | 45.0 | -1.3 | 20.0 | 31.5 | 35.5 | 32.5 | 21.1 | 46.1 | 36.1 | 27.3 | 42.6 | 31.5 | 35.5 |
| earnings Q1 | 40.4 | 27.1 | 14.9 | 40.9 | 42.5 | 25.4 | 23.3 | 14.9 | 7.0 | 43.0 | 17.1 | 15.7 | 36.7 | 29.4 | 22.4 | 42.1 | 18.4 | 19.2 | 30.7 | 33.6 | 27.3 | 20.1 | 40.2 | 28.8 | 32.3 | 37.7 | 30.2 | 32.5 |
| earnings Q2 | 60.6 | 21.5 | 31.8 | 43.1 | 46.7 | 22.6 | 33.7 | 21.5 | 10.1 | 43.0 | 20.1 | 32.4 | 20.1 | 30.9 | 25.2 | 41.4 | 19.1 | 24.7 | 23.9 | 40.1 | 31.5 | 23.0 | 28.7 | 43.5 | 33.3 | 41.7 | 31.5 | 43.3 |
| earnings Q3 | 55.0 | 21.6 | 30.9 | 44.5 | 45.5 | 22.6 | 41.8 | 38.1 | 24.5 | 37.1 | 30.5 | 41.3 | 10.7 | 32.2 | 30.9 | 40.4 | 25.3 | 30.5 | 47.9 | 43.6 | 29.5 | 28.3 | 32.4 | 38.6 | 31.7 | 46.0 | 31.6 | 39.2 |
| earnings Q4 | 55.1 | 21.2 | 31.5 | 45.3 | 47.1 | 22.6 | 50.0 | 39.9 | 30.0 | 35.6 | 30.9 | 52.6 | 19.8 | 31.9 | 29.2 | 47.0 | 39.9 | 26.8 | 50.1 | 45.9 | 29.0 | 37.5 | 33.2 | 40.7 | 32.3 | 48.6 | 42.1 | 36.3 |
| earnings Q5 | 58.4 | 20.1 | 32.1 | 55.5 | 44.4 | 22.8 | 54.3 | 47.6 | 37.6 | 39.8 | 38.5 | 49.7 | 33.1 | 30.7 | 24.2 | 47.7 | 39.8 | 26.7 | 51.0 | 46.1 | 29.7 | 44.7 | 30.8 | 44.2 | 34.2 | 52.4 | 56.6 | 42.9 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income. "Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A5: Characteristics of the population facing short-term PTRs above 75% in 2017

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sample size | 3180 | 1646 | 252 | 3147 | 5266 | 376 | 366 | 1744 | 1305 | 8444 | 167 | 1911 | 314 | 133 | 194 | 3353 | 546 | 219 | 4646 | 1110 | 780 | 5129 | 349 | 1285 | 248 | 2264 | 1174 | 1188 |
| % sample | 61.0 | 31.9 | 3.9 | 49.7 | 48.5 | 5.9 | 7.6 | 17.0 | 12.2 | 81.3 | 3.3 | 11.9 | 7.2 | 2.1 | 4.8 | 84.0 | 8.9 | 5.1 | 39.4 | 20.1 | 6.0 | 63.7 | 4.9 | 11.8 | 4.3 | 20.3 | 20.5 | 7.1 |
| % male | 46.4 | 48.4 | 48.8 | 43.6 | 57.9 | 49.0 | 39.4 | 49.8 | 49.8 | 51.1 | 43.8 | 33.5 | 59.0 | 40.7 | 56.0 | 51.9 | 52.9 | 59.3 | 68.6 | 42.5 | 52.6 | 45.7 | 63.2 | 57.1 | 59.9 | 48.4 | 44.3 | 48.5 |
| % female | 53.6 | 51.6 | 51.2 | 56.4 | 42.1 | 51.0 | 60.6 | 50.2 | 50.2 | 48.9 | 56.2 | 66.5 | 41.0 | 59.3 | 44.0 | 48.1 | 47.1 | 40.7 | 31.4 | 57.5 | 47.4 | 54.3 | 36.8 | 42.9 | 40.1 | 51.6 | 55.7 | 51.5 |
| % age (<30) | 20.7 | 1.2 | 16.0 | 9.8 | 9.2 | 24.3 | 15.2 | 20.1 | 16.7 | 18.3 | 12.0 | 10.5 | 14.4 | 14.5 | 27.3 | 17.4 | 20.7 | 57.5 | 7.6 | 26.3 | 10.4 | 10.8 | 33.6 | 6.0 | 21.2 | 22.7 | 33.5 | 19.0 |
| % age (30-50) | 58.2 | 51.8 | 54.6 | 57.8 | 63.5 | 51.9 | 57.3 | 62.7 | 63.5 | 58.3 | 61.5 | 40.0 | 63.7 | 53.4 | 57.5 | 65.3 | 32.7 | 28.9 | 54.9 | 60.7 | 56.0 | 65.7 | 44.2 | 57.8 | 61.3 | 54.9 | 46.7 | 59.4 |
| % age (50+) | 21.0 | 47.0 | 29.4 | 32.5 | 27.3 | 23.8 | 27.5 | 17.2 | 19.7 | 23.4 | 26.4 | 49.5 | 21.9 | 32.1 | 15.2 | 17.4 | 46.6 | 13.6 | 37.5 | 13.0 | 33.6 | 23.4 | 22.1 | 36.3 | 17.5 | 22.4 | 19.7 | 21.6 |
| % low-skilled | 15.0 | 12.6 | 4.8 | 14.1 | 5.3 | 15.7 | 26.4 | 29.3 | 48.4 | 12.9 | 22.3 | 37.5 | 30.9 | 29.2 | 14.1 | 31.6 | 18.4 | 51.6 | 17.9 | 21.8 | 12.5 | 52.8 | 65.8 | 17.5 | 3.4 | 16.3 | 15.6 | 54.2 |
| % medium-skilled | 43.0 | 65.7 | 79.7 | 52.6 | 53.0 | 60.1 | 36.7 | 49.0 | 23.9 | 47.5 | 70.1 | 47.1 | 54.2 | 59.4 | 67.7 | 40.2 | 63.3 | 31.7 | 40.2 | 58.5 | 69.9 | 26.7 | 28.4 | 64.2 | 82.8 | 49.5 | 51.7 | 26.9 |
| % high-skilled | 42.1 | 21.7 | 15.4 | 33.3 | 41.8 | 24.2 | 37.0 | 21.7 | 27.7 | 39.6 | 7.5 | 15.4 | 14.9 | 11.4 | 18.2 | 28.2 | 18.2 | 16.7 | 41.9 | 19.7 | 17.6 | 20.5 | 5.8 | 18.2 | 13.8 | 34.2 | 32.7 | 18.9 |
| % employee | 98.5 | 99.4 | 34.4 | 95.7 | 99.3 | 93.9 | 79.5 | 74.1 | 79.4 | 99.3 | 55.2 | 98.7 | 82.0 | 88.5 | 95.8 | 95.3 | 60.3 | 84.1 | 99.5 | 92.4 | 62.0 | 97.8 | 13.1 | 69.5 | 37.6 | 91.9 | 92.3 | 87.6 |
| % self-employed | 1.5 | 0.6 | 65.6 | 4.3 | 0.7 | 6.1 | 20.5 | 25.9 | 20.6 | 0.7 | 44.8 | 1.0 | 18.0 | 11.5 | 4.2 | 4.7 | 39.7 | 15.9 | 0.5 | 7.6 | 38.0 | 2.2 | 86.9 | 30.5 | 62.4 | 8.1 | 7.7 | 12.4 |
| % main earner | 59.6 | 63.4 | 49.3 | 55.3 | 70.1 | 63.6 | 68.3 | 57.3 | 61.8 | 67.0 | 59.9 | 43.5 | 78.1 | 86.3 | 60.8 | 64.5 | 51.5 | 40.2 | 85.1 | 54.9 | 44.8 | 61.4 | 50.3 | 50.2 | 59.7 | 66.5 | 51.5 | 71.0 |
| % secondary earner | 40.4 | 36.6 | 50.7 | 44.7 | 29.9 | 36.4 | 31.7 | 42.7 | 38.2 | 33.0 | 40.1 | 56.5 | 21.9 | 13.7 | 39.2 | 35.5 | 48.5 | 59.8 | 14.9 | 45.1 | 55.2 | 38.6 | 49.7 | 49.8 | 40.3 | 33.5 | 48.5 | 29.0 |
| % part-timer | 19.4 | 5.0 | 19.6 | 12.3 | 10.6 | 26.1 | 61.6 | 45.3 | 43.2 | 11.6 | 19.9 | 26.9 | 23.8 | 39.3 | 29.1 | 16.6 | 24.3 | 33.4 | 16.5 | 41.1 | 15.4 | 5.8 | 24.2 | 16.8 | 10.2 | 27.9 | 6.6 | 47.6 |
| % earnings Q1 | 17.6 | 8.9 | 81.6 | 19.4 | 6.3 | 86.7 | 56.5 | 67.5 | 54.8 | 10.5 | 67.1 | 25.2 | 5.6 | 89.4 | 90.8 | 15.1 | 45.3 | 91.1 | 14.2 | 40.2 | 67.1 | 16.0 | 93.1 | 42.9 | 77.4 | 39.8 | 48.4 | 54.2 |
| % earnings Q2 | 25.4 | 24.4 | 14.7 | 29.7 | 18.1 | 11.8 | 34.1 | 23.0 | 40.8 | 21.4 | 22.6 | 32.1 | 65.7 | 10.6 | 6.4 | 22.2 | 30.9 | 5.3 | 5.0 | 44.6 | 27.9 | 18.6 | 0.9 | 25.1 | 8.5 | 25.0 | 46.8 | 15.3 |
| % earnings Q3 | 29.1 | 25.8 | 2.4 | 31.8 | 18.5 | 1.5 | 7.8 | 8.6 | 4.3 | 23.3 | 7.7 | 25.2 | 24.8 | 0.0 | 2.8 | 22.8 | 8.4 | 3.6 | 12.1 | 10.5 | 4.4 | 22.4 | 1.5 | 27.3 | 4.6 | 14.5 | 2.4 | 16.9 |
| % earnings Q4 | 25.5 | 23.2 | 1.3 | 17.3 | 25.7 | 0.0 | 1.6 | 0.8 | 0.2 | 23.0 | 2.6 | 15.9 | 4.0 | 0.0 | 0.0 | 23.4 | 8.6 | 0.0 | 32.0 | 4.3 | 0.5 | 27.3 | 1.0 | 4.5 | 5.3 | 12.4 | 1.2 | 10.3 |
| % earnings Q5 | 2.4 | 17.6 | 0.0 | 1.7 | 31.5 | 0.0 | 0.0 | 0.0 | 0.0 | 21.8 | 0.0 | 1.6 | 0.0 | 0.0 | 0.0 | 16.5 | 6.8 | 0.0 | 36.8 | 0.4 | 0.0 | 15.7 | 3.5 | 0.2 | 4.2 | 8.3 | 1.2 | 3.4 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income. "Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A6: Characteristics of the population facing long-term PTRs above 50% in 2017

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sample size | 2160 | 100 | 895 | 2698 | 3184 | 663 | 1492 | 3416 | 1417 | 2183 | 153 | 353 | 1058 | 424 | 234 | 1206 | 1133 | 953 | 1069 | 2065 | 1637 | 2732 | 542 | 1575 | 1075 | 7255 | 483 | 3677 |
| % sample | 40.8 | 2.2 | 12.9 | 49.7 | 31.1 | 10.7 | 30.7 | 32.6 | 13.6 | 23.3 | 3.1 | 1.8 | 21.9 | 6.8 | 6.7 | 33.4 | 18.8 | 21.3 | 15.9 | 36.2 | 13.3 | 32.7 | 7.6 | 19.5 | 18.0 | 62.6 | 10.2 | 21.5 |
| % male | 58.6 | 57.1 | 52.4 | 57.4 | 57.5 | 49.8 | 59.5 | 65.4 | 57.2 | 57.4 | 50.5 | 61.7 | 54.0 | 43.1 | 65.5 | 61.5 | 56.1 | 65.5 | 58.5 | 61.1 | 53.8 | 53.3 | 67.0 | 62.0 | 63.6 | 50.9 | 62.9 | 60.8 |
| % female | 41.4 | 42.9 | 47.6 | 42.6 | 42.5 | 50.2 | 40.5 | 34.6 | 42.8 | 42.6 | 49.5 | 38.3 | 46.0 | 56.9 | 34.5 | 38.5 | 43.9 | 34.5 | 41.5 | 38.9 | 46.2 | 46.7 | 33.0 | 38.0 | 36.4 | 49.1 | 37.1 | 39.2 |
| % age (<30) | 21.9 | 19.8 | 15.5 | 19.7 | 22.7 | 27.2 | 17.0 | 12.4 | 10.3 | 20.8 | 13.2 | 10.4 | 21.1 | 15.9 | 34.2 | 12.6 | 33.6 | 50.3 | 37.2 | 26.4 | 14.6 | 13.2 | 30.7 | 14.0 | 12.3 | 17.5 | 20.7 | 19.8 |
| % age (30-50) | 52.9 | 58.1 | 62.2 | 58.4 | 51.5 | 51.0 | 54.5 | 62.8 | 65.8 | 62.4 | 68.2 | 40.6 | 57.6 | 55.2 | 55.6 | 67.9 | 43.5 | 33.4 | 39.9 | 55.0 | 71.2 | 63.8 | 50.6 | 67.0 | 65.8 | 56.9 | 50.7 | 60.9 |
| % age (50+) | 25.2 | 22.1 | 22.3 | 21.9 | 25.8 | 21.7 | 28.5 | 24.8 | 23.9 | 16.7 | 18.6 | 49.0 | 21.2 | 28.8 | 10.1 | 19.5 | 23.0 | 16.3 | 22.8 | 18.6 | 14.2 | 23.0 | 18.8 | 19.0 | 21.9 | 25.6 | 28.6 | 19.4 |
| % low-skilled | 12.9 | 64.6 | 5.1 | 16.6 | 9.5 | 18.1 | 19.0 | 30.1 | 48.5 | 16.5 | 17.0 | 28.0 | 28.8 | 16.6 | 20.6 | 38.4 | 13.8 | 57.5 | 29.1 | 14.6 | 9.5 | 66.1 | 60.5 | 11.9 | 3.1 | 11.9 | 16.9 | 48.9 |
| % medium-skilled | 34.1 | 31.1 | 79.5 | 47.8 | 60.1 | 58.1 | 33.0 | 43.8 | 23.6 | 56.0 | 73.7 | 35.8 | 49.1 | 66.6 | 63.5 | 34.4 | 63.6 | 30.4 | 46.3 | 55.0 | 71.2 | 23.0 | 34.7 | 64.5 | 76.9 | 45.5 | 47.4 | 26.5 |
| % high-skilled | 52.9 | 4.4 | 15.4 | 35.7 | 30.4 | 23.8 | 48.0 | 26.1 | 27.9 | 27.4 | 9.3 | 36.2 | 22.1 | 16.8 | 15.9 | 27.2 | 22.7 | 12.0 | 24.6 | 30.5 | 19.4 | 10.9 | 4.8 | 23.6 | 20.0 | 42.6 | 35.6 | 24.7 |
| % employee | 88.7 | 74.0 | 60.7 | 95.9 | 94.9 | 94.0 | 84.5 | 41.8 | 63.0 | 91.4 | 67.3 | 25.1 | 86.3 | 91.7 | 92.6 | 93.8 | 64.7 | 87.1 | 98.5 | 90.6 | 81.2 | 92.5 | 23.7 | 81.6 | 38.8 | 93.0 | 86.8 | 86.0 |
| % self-employed | 11.3 | 26.0 | 39.3 | 4.1 | 5.1 | 6.0 | 15.5 | 58.2 | 37.0 | 8.6 | 32.7 | 72.5 | 13.7 | 8.3 | 7.4 | 6.2 | 35.3 | 12.9 | 1.5 | 9.4 | 18.8 | 7.5 | 76.3 | 18.4 | 61.2 | 7.0 | 13.2 | 14.0 |
| % main earner | 76.8 | 87.3 | 72.2 | 75.8 | 75.2 | 71.8 | 73.6 | 77.9 | 75.1 | 75.7 | 76.9 | 63.2 | 76.9 | 95.5 | 77.9 | 91.0 | 51.7 | 50.3 | 80.4 | 82.6 | 56.1 | 86.9 | 58.7 | 80.6 | 69.1 | 71.8 | 93.2 | 88.6 |
| % secondary earner | 23.2 | 12.7 | 27.8 | 24.2 | 24.8 | 28.2 | 26.4 | 22.1 | 24.9 | 24.3 | 23.1 | 36.8 | 23.1 | 4.5 | 22.1 | 9.0 | 48.3 | 49.7 | 19.6 | 17.4 | 43.9 | 13.1 | 41.3 | 19.4 | 30.9 | 28.2 | 6.8 | 11.4 |
| % part-timer | 11.3 | 43.6 | 9.7 | 10.5 | 13.4 | 19.2 | 32.1 | 22.9 | 35.3 | 13.0 | 17.0 | 10.7 | 21.1 | 19.7 | 17.6 | 13.2 | 13.4 | 11.0 | 35.2 | 17.1 | 9.3 | 7.5 | 18.6 | 11.9 | 6.2 | 14.0 | 12.5 | 20.7 |
| % earnings Q1 | 17.5 | 83.4 | 43.4 | 22.1 | 20.2 | 58.5 | 24.6 | 36.4 | 39.7 | 15.5 | 46.7 | 23.6 | 26.6 | 43.4 | 64.3 | 17.3 | 30.6 | 38.1 | 30.6 | 23.7 | 29.4 | 22.4 | 80.2 | 29.1 | 36.7 | 17.9 | 25.4 | 22.8 |
| % earnings Q2 | 18.2 | 10.1 | 21.5 | 21.7 | 26.6 | 26.2 | 24.8 | 19.3 | 41.1 | 28.9 | 32.0 | 14.5 | 33.7 | 36.3 | 25.1 | 24.0 | 32.2 | 42.8 | 28.8 | 21.7 | 34.8 | 29.0 | 9.3 | 27.1 | 14.9 | 22.1 | 26.4 | 21.0 |
| % earnings Q3 | 17.9 | 4.9 | 18.2 | 20.8 | 22.3 | 11.2 | 14.8 | 13.8 | 16.0 | 26.2 | 13.3 | 9.9 | 25.3 | 14.9 | 7.9 | 23.4 | 16.1 | 16.6 | 22.5 | 19.4 | 24.7 | 25.4 | 4.7 | 19.4 | 12.7 | 19.6 | 20.5 | 22.5 |
| % earnings Q4 | 17.3 | 1.3 | 12.2 | 16.9 | 18.4 | 3.6 | 13.4 | 14.2 | 3.0 | 19.8 | 7.9 | 11.8 | 10.7 | 5.2 | 2.0 | 16.6 | 9.7 | 2.1 | 13.7 | 18.5 | 9.0 | 15.5 | 3.2 | 12.7 | 13.4 | 18.6 | 12.8 | 19.1 |
| % earnings Q5 | 29.2 | 0.4 | 4.6 | 18.5 | 12.5 | 0.5 | 22.5 | 16.2 | 0.1 | 9.6 | 0.2 | 40.2 | 3.7 | 0.3 | 0.6 | 18.8 | 11.4 | 0.4 | 4.4 | 16.7 | 2.0 | 7.8 | 2.6 | 11.7 | 22.3 | 21.8 | 15.0 | 14.6 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income."Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A7: Characteristics of the population facing short-term METRs above 50% in 2017

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|--------------------|------|----|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sample size | 4318 | 26 | 185 | 1995 | 2200 | 100 | 1508 | 912 | 54 | 1743 | 49 | 3410 | 476 | 86 | 69 | 955 | 372 | 106 | 2553 | 601 | 465 | 496 | 411 | 1077 | 509 | 4143 | 2150 | 3085 |
| % sample | 81.4 | - | 2.7 | 28.8 | 21.1 | 1.7 | 32.3 | 8.6 | 0.5 | 17.6 | 0.9 | 21.0 | 9.1 | 1.3 | 2.1 | 25.1 | 7.0 | 2.5 | 24.0 | 11.0 | 3.5 | 6.3 | 5.4 | 11.7 | 9.8 | 31.4 | 34.0 | 16.9 |
| % male | 55.3 | - | 38.4 | 64.4 | 40.6 | 52.2 | 59.3 | 78.8 | 49.2 | 53.4 | 64.3 | 68.8 | 39.7 | 41.6 | 65.5 | 44.2 | 62.9 | 63.0 | 71.6 | 53.6 | 55.4 | 51.4 | 67.4 | 58.9 | 75.0 | 63.8 | 65.4 | 54.0 |
| % female | 44.7 | - | 61.6 | 35.6 | 59.4 | 47.8 | 40.7 | 21.2 | 50.8 | 46.6 | 35.7 | 31.2 | 60.3 | 58.4 | 34.5 | 55.8 | 37.1 | 37.0 | 28.4 | 46.4 | 44.6 | 48.6 | 32.6 | 41.1 | 25.0 | 36.2 | 34.6 | 46.0 |
| % age (<30) | 15.5 | - | 15.2 | 9.0 | 13.7 | 27.6 | 5.4 | 2.3 | 0.9 | 27.2 | 21.8 | 5.2 | 23.5 | 14.6 | 40.0 | 17.3 | 9.7 | 47.3 | 16.5 | 20.1 | 18.2 | 9.0 | 35.4 | 13.5 | 11.4 | 11.6 | 5.6 | 15.4 |
| % age (30-50) | 60.8 | - | 68.1 | 59.4 | 54.6 | 52.9 | 67.1 | 63.0 | 76.5 | 53.1 | 42.0 | 68.4 | 58.6 | 57.5 | 50.7 | 61.9 | 62.0 | 34.4 | 58.5 | 52.7 | 65.2 | 66.5 | 40.5 | 68.8 | 67.8 | 57.3 | 60.0 | 66.6 |
| % age (50+) | 23.6 | - | 16.6 | 31.6 | 31.7 | 19.5 | 27.5 | 34.7 | 22.5 | 19.7 | 36.2 | 26.4 | 17.9 | 27.9 | 9.3 | 20.8 | 28.4 | 18.3 | 25.0 | 27.2 | 16.5 | 24.5 | 24.0 | 17.7 | 20.8 | 31.1 | 34.4 | 17.9 |
| % low-skilled | 10.5 | - | 10.7 | 10.5 | 9.1 | 14.9 | 13.6 | 13.6 | 32.1 | 17.9 | 14.9 | 26.0 | 34.1 | 34.8 | 24.9 | 24.4 | 5.8 | 58.6 | 16.7 | 14.3 | 14.8 | 34.3 | 72.8 | 13.5 | 1.6 | 8.1 | 7.7 | 51.5 |
| % medium-skilled | 36.2 | - | 78.1 | 36.1 | 54.4 | 62.4 | 16.9 | 31.1 | 15.9 | 55.0 | 42.8 | 44.9 | 46.1 | 55.5 | 65.3 | 36.3 | 59.6 | 30.9 | 37.5 | 47.9 | 70.4 | 18.2 | 26.4 | 62.3 | 75.8 | 30.0 | 39.8 | 25.6 |
| % high-skilled | 53.2 | - | 11.2 | 53.4 | 36.6 | 22.7 | 69.5 | 55.3 | 52.0 | 27.0 | 42.3 | 29.1 | 19.7 | 9.7 | 9.8 | 39.3 | 34.6 | 10.5 | 45.8 | 37.8 | 14.8 | 47.5 | 0.9 | 24.2 | 22.6 | 61.9 | 52.5 | 22.9 |
| % employee | 92.7 | - | 89.9 | 95.5 | 94.7 | 94.3 | 90.9 | 44.8 | 96.6 | 90.5 | 97.0 | 80.5 | 89.1 | 85.0 | 100.0 | 93.2 | 40.7 | 87.2 | 95.7 | 73.6 | 93.2 | 94.1 | 3.9 | 86.2 | 11.9 | 94.5 | 94.3 | 84.3 |
| % self-employed | 7.3 | - | 10.1 | 4.5 | 5.3 | 5.7 | 9.1 | 55.2 | 3.4 | 9.5 | 3.0 | 19.2 | 10.9 | 15.0 | 0.0 | 6.8 | 59.3 | 12.8 | 4.3 | 26.4 | 6.8 | 5.9 | 96.1 | 13.8 | 88.1 | 5.5 | 5.7 | 15.7 |
| % main earner | 67.0 | - | 76.1 | 87.7 | 60.9 | 88.9 | 77.3 | 94.7 | 79.2 | 71.6 | 93.8 | 84.8 | 64.2 | 82.1 | 84.5 | 65.6 | 67.9 | 51.4 | 89.0 | 71.1 | 66.8 | 71.8 | 48.3 | 74.4 | 78.2 | 82.2 | 84.1 | 84.2 |
| % secondary earner | 33.0 | - | 23.9 | 12.3 | 39.1 | 11.1 | 22.7 | 5.3 | 20.8 | 28.4 | 6.2 | 15.2 | 35.8 | 17.9 | 15.5 | 34.4 | 32.1 | 48.6 | 11.0 | 28.9 | 33.2 | 28.2 | 51.7 | 25.6 | 21.8 | 17.8 | 15.9 | 15.8 |
| % part-timer | 10.9 | - | 9.8 | 5.2 | 27.2 | 26.2 | 18.4 | 4.2 | 15.3 | 21.7 | 7.0 | 4.4 | 34.6 | 42.5 | 32.7 | 20.7 | 3.1 | 26.0 | 17.6 | 26.8 | 20.8 | 8.5 | 24.4 | 11.4 | 4.9 | 10.2 | 3.4 | 29.1 |
| % earnings Q1 | 7.2 | - | 44.5 | 8.2 | 30.0 | 93.4 | 8.7 | 5.3 | 6.7 | 29.7 | 29.4 | 1.5 | 65.5 | 97.2 | 89.5 | 18.0 | 5.0 | 72.3 | 11.9 | 30.2 | 44.6 | 25.1 | 96.4 | 24.1 | 18.2 | 12.1 | 7.4 | 33.2 |
| % earnings Q2 | 21.7 | - | 38.2 | 9.9 | 15.9 | 6.6 | 9.8 | 2.1 | 23.3 | 34.9 | 8.7 | 3.7 | 25.0 | 2.2 | 2.9 | 14.4 | 15.9 | 22.3 | 13.1 | 31.5 | 27.7 | 14.4 | 2.6 | 39.5 | 13.4 | 4.8 | 2.9 | 29.4 |
| % earnings Q3 | 22.9 | - | 11.5 | 9.7 | 9.2 | 0.0 | 10.8 | 6.4 | 40.8 | 15.5 | 8.5 | 11.2 | 3.9 | 0.0 | 7.6 | 11.9 | 26.7 | 5.4 | 23.1 | 7.2 | 13.6 | 2.5 | 1.0 | 15.3 | 14.3 | 2.7 | 2.4 | 16.0 |
| % earnings Q4 | 23.6 | - | 4.8 | 7.5 | 28.5 | 0.0 | 20.0 | 4.8 | 15.3 | 8.1 | 4.0 | 40.6 | 2.9 | 0.0 | 0.0 | 39.6 | 19.8 | 0.0 | 12.7 | 14.4 | 7.6 | 7.1 | 0.0 | 7.9 | 18.8 | 16.6 | 26.4 | 6.1 |
| % earnings Q5 | 24.7 | - | 1.0 | 64.6 | 16.3 | 0.0 | 50.7 | 81.4 | 13.9 | 11.8 | 49.4 | 43.1 | 2.7 | 0.6 | 0.0 | 16.1 | 32.7 | 0.0 | 39.3 | 16.7 | 6.5 | 50.9 | 0.0 | 13.1 | 35.4 | 63.8 | 60.9 | 15.3 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income."Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household. Results for Bulgaria omitted due to small sample size.

Source: own calculations using EUROMOD version H1.0.

Table A8: Characteristics of the population facing short-term PTRs above 120% of the median in each country in 2017

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sample size | 246 | 1155 | 1644 | 896 | 334 | 563 | 1124 | 2571 | 3375 | 281 | 432 | 1229 | 1176 | 159 | 1128 | 21 | 1254 | 1836 | 393 | 909 | 3392 | 603 | 958 | 2370 | 602 | 577 | 560 | 5465 |
| % sample | 4.5 | 21.7 | 20.9 | 15.5 | 3.6 | 8.8 | 23.1 | 25.0 | 30.3 | 2.8 | 8.4 | 7.7 | 24.5 | 2.5 | 24.6 | - | 19.9 | 41.0 | 5.9 | 16.5 | 27.1 | 7.8 | 13.4 | 21.4 | 10.4 | 4.9 | 9.9 | 31.1 |
| % male | 27.9 | 47.8 | 53.6 | 36.8 | 65.0 | 48.6 | 49.4 | 52.4 | 52.6 | 48.0 | 43.5 | 30.7 | 54.7 | 42.7 | 52.6 | - | 57.2 | 64.8 | 65.7 | 38.9 | 53.5 | 26.4 | 54.7 | 53.7 | 63.1 | 48.9 | 48.8 | 53.6 |
| % female | 72.1 | 52.2 | 46.4 | 63.2 | 35.0 | 51.4 | 50.6 | 47.6 | 47.4 | 52.0 | 56.5 | 69.3 | 45.3 | 57.3 | 47.4 | - | 42.8 | 35.2 | 34.3 | 61.1 | 46.5 | 73.6 | 45.3 | 46.3 | 36.9 | 51.1 | 51.2 | 46.4 |
| % age (<30) | 27.4 | 1.5 | 7.6 | 15.2 | 35.7 | 21.2 | 12.6 | 19.1 | 18.3 | 26.6 | 6.8 | 10.4 | 19.6 | 15.9 | 16.4 | - | 19.5 | 43.5 | 31.0 | 26.4 | 12.6 | 13.1 | 18.0 | 4.4 | 17.0 | 21.4 | 30.7 | 17.1 |
| % age (30-50) | 50.4 | 37.7 | 38.3 | 54.3 | 54.8 | 54.3 | 53.9 | 62.8 | 61.5 | 51.5 | 73.3 | 41.1 | 59.1 | 53.4 | 38.0 | - | 32.6 | 38.1 | 46.7 | 61.8 | 53.7 | 63.8 | 58.6 | 56.4 | 62.2 | 50.2 | 47.7 | 63.2 |
| % age (50+) | 22.2 | 60.8 | 54.1 | 30.5 | 9.5 | 24.5 | 33.5 | 18.2 | 20.2 | 21.9 | 19.9 | 48.5 | 21.3 | 30.7 | 45.5 | - | 47.9 | 18.4 | 22.3 | 11.8 | 33.8 | 23.2 | 23.4 | 39.3 | 20.9 | 28.4 | 21.6 | 19.7 |
| % low-skilled | 28.4 | 12.7 | 3.7 | 18.5 | 21.7 | 17.2 | 20.7 | 28.6 | 45.4 | 25.6 | 21.8 | 39.0 | 27.4 | 26.1 | 7.3 | - | 15.1 | 50.0 | 26.2 | 22.3 | 9.6 | 55.7 | 45.9 | 18.0 | 3.1 | 15.1 | 17.5 | 49.6 |
| % medium-skilled | 45.7 | 68.2 | 80.4 | 53.1 | 50.6 | 57.7 | 31.8 | 48.6 | 25.0 | 55.9 | 70.9 | 47.3 | 48.9 | 62.1 | 70.5 | - | 62.5 | 28.8 | 53.0 | 58.2 | 72.3 | 21.5 | 50.7 | 66.2 | 78.3 | 54.0 | 51.9 | 26.1 |
| % high-skilled | 25.9 | 19.2 | 15.9 | 28.4 | 27.7 | 25.1 | 47.6 | 22.7 | 29.6 | 18.4 | 7.3 | 13.7 | 23.7 | 11.8 | 22.2 | - | 22.4 | 21.2 | 20.9 | 19.5 | 18.1 | 22.8 | 3.4 | 15.8 | 18.6 | 30.9 | 30.6 | 24.3 |
| % employee | 92.2 | 99.3 | 62.2 | 89.4 | 99.3 | 95.1 | 84.4 | 72.6 | 84.7 | 89.8 | 72.3 | 98.1 | 86.5 | 88.4 | 98.0 | - | 67.2 | 90.2 | 98.2 | 92.9 | 81.4 | 94.4 | 60.8 | 79.2 | 38.6 | 77.4 | 86.7 | 89.9 |
| % self-employed | 7.8 | 0.7 | 37.8 | 10.6 | 0.7 | 4.9 | 15.6 | 27.4 | 15.3 | 10.2 | 27.7 | 1.6 | 13.5 | 11.6 | 2.0 | - | 32.8 | 9.8 | 1.8 | 7.1 | 18.6 | 5.6 | 39.2 | 20.8 | 61.4 | 22.6 | 13.3 | 10.1 |
| % main earner | 57.0 | 62.8 | 61.0 | 44.3 | 54.4 | 61.3 | 71.5 | 61.9 | 66.3 | 42.9 | 57.8 | 41.0 | 76.4 | 88.5 | 55.9 | - | 57.4 | 54.2 | 78.3 | 49.6 | 57.0 | 31.1 | 54.0 | 54.4 | 66.4 | 70.1 | 57.9 | 78.3 |
| % secondary earner | 43.0 | 37.2 | 39.0 | 55.7 | 45.6 | 38.7 | 28.5 | 38.1 | 33.7 | 57.1 | 42.2 | 59.0 | 23.6 | 11.5 | 44.1 | - | 42.6 | 45.8 | 21.7 | 50.4 | 43.0 | 68.9 | 46.0 | 45.6 | 33.6 | 29.9 | 42.1 | 21.7 |
| % part-timer | 67.6 | 6.1 | 6.7 | 24.9 | 15.1 | 24.2 | 41.2 | 36.3 | 30.3 | 37.7 | 12.5 | 29.7 | 20.2 | 36.3 | 9.8 | - | 15.7 | 9.7 | 47.8 | 46.5 | 10.6 | 25.3 | 11.4 | 13.5 | 8.9 | 29.6 | 10.1 | 27.6 |
| % earnings Q1 | 95.7 | 10.6 | 31.1 | 48.6 | 42.7 | 78.8 | 31.0 | 52.8 | 24.3 | 79.5 | 43.9 | 34.0 | 24.8 | 81.3 | 32.4 | - | 33.9 | 25.6 | 60.8 | 47.0 | 31.9 | 61.8 | 45.4 | 28.9 | 50.1 | 53.6 | 62.4 | 30.1 |
| % earnings Q2 | 4.3 | 23.9 | 24.8 | 48.3 | 12.2 | 16.9 | 25.9 | 31.7 | 36.9 | 12.6 | 32.8 | 35.8 | 30.7 | 16.7 | 32.1 | - | 19.6 | 25.2 | 18.1 | 44.4 | 28.4 | 4.3 | 42.4 | 27.0 | 13.9 | 29.5 | 33.9 | 19.8 |
| % earnings Q3 | 0.0 | 27.4 | 16.8 | 1.3 | 12.7 | 3.4 | 14.8 | 9.9 | 27.2 | 5.4 | 20.1 | 19.7 | 24.6 | 1.9 | 22.8 | - | 17.5 | 22.8 | 8.8 | 7.0 | 24.1 | 5.8 | 7.9 | 29.3 | 10.2 | 8.6 | 1.0 | 19.2 |
| % earnings Q4 | 0.0 | 22.2 | 18.1 | 1.3 | 17.1 | 0.9 | 12.7 | 5.2 | 11.3 | 1.2 | 3.3 | 9.7 | 12.5 | 0.0 | 11.9 | - | 15.9 | 16.1 | 3.7 | 1.4 | 13.9 | 22.6 | 3.0 | 13.9 | 10.9 | 5.4 | 0.8 | 16.8 |
| % earnings Q5 | 0.0 | 15.9 | 9.2 | 0.4 | 15.2 | 0.0 | 15.6 | 0.4 | 0.2 | 1.4 | 0.0 | 0.8 | 7.4 | 0.0 | 0.8 | - | 13.1 | 10.2 | 8.6 | 0.1 | 1.8 | 5.6 | 1.3 | 0.9 | 15.0 | 2.9 | 1.8 | 14.0 |
| threshold | 93.3 | 80.4 | 57.8 | 89.9 | 89.8 | 66.6 | 54.0 | 66.8 | 52.8 | 95.6 | 67.2 | 77.8 | 47.1 | 69.7 | 49.9 | 105.3 | 56.5 | 36.5 | 85.7 | 82.3 | 51.0 | 95.0 | 59.2 | 69.8 | 59.1 | 85.0 | 77.5 | 48.9 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income."Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household. Results for Luxembourg omitted due to small sample size.

Source: own calculations using EUROMOD version H1.0.

Table A9: Characteristics of the population facing long-term PTRs above 120% of the median in each country in 2017

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sample size | 1040 | 1390 | 2136 | 1806 | 2960 | 1691 | 1240 | 3165 | 3577 | 2840 | 1395 | 6299 | 2133 | 981 | 1054 | 1181 | 1789 | 1898 | 3474 | 1692 | 3404 | 3405 | 1699 | 2358 | 2775 | 2299 | 1817 | 6386 |
| % sample | 19.8 | 30.1 | 30.3 | 37.3 | 29.0 | 27.5 | 25.6 | 30.2 | 33.4 | 30.0 | 26.6 | 36.3 | 45.0 | 15.9 | 27.6 | 32.6 | 28.6 | 42.4 | 33.8 | 29.9 | 28.3 | 41.2 | 24.1 | 28.7 | 43.4 | 22.2 | 31.7 | 36.7 |
| % male | 56.2 | 55.2 | 57.6 | 53.5 | 56.8 | 48.0 | 59.7 | 64.7 | 59.6 | 58.2 | 54.7 | 61.6 | 58.8 | 50.4 | 53.4 | 61.1 | 56.3 | 67.2 | 68.4 | 59.9 | 58.4 | 55.7 | 64.4 | 61.3 | 61.8 | 49.8 | 65.4 | 60.3 |
| % female | 43.8 | 44.8 | 42.4 | 46.5 | 43.2 | 52.0 | 40.3 | 35.3 | 40.4 | 41.8 | 45.3 | 38.4 | 41.2 | 49.6 | 46.6 | 38.9 | 43.7 | 32.8 | 31.6 | 40.1 | 41.6 | 44.3 | 35.6 | 38.7 | 38.2 | 50.2 | 34.6 | 39.7 |
| % age (<30) | 20.0 | 10.9 | 12.7 | 22.1 | 22.4 | 24.5 | 17.8 | 12.0 | 7.4 | 19.9 | 16.3 | 6.5 | 17.0 | 13.8 | 29.5 | 12.8 | 31.3 | 42.4 | 22.4 | 29.0 | 12.8 | 11.1 | 27.1 | 14.3 | 24.4 | 29.5 | 11.6 | 18.0 |
| % age (30-50) | 55.7 | 65.9 | 65.0 | 58.6 | 51.9 | 51.1 | 52.5 | 62.6 | 66.0 | 61.9 | 56.5 | 59.8 | 58.8 | 57.5 | 47.9 | 67.7 | 47.8 | 38.0 | 43.5 | 54.0 | 72.8 | 65.0 | 53.5 | 66.6 | 57.6 | 46.4 | 58.7 | 60.9 |
| % age (50+) | 24.3 | 23.3 | 22.3 | 19.2 | 25.7 | 24.3 | 29.7 | 25.4 | 26.6 | 18.1 | 27.3 | 33.7 | 24.3 | 28.8 | 22.6 | 19.5 | 20.9 | 19.7 | 34.1 | 17.0 | 14.4 | 23.9 | 19.4 | 19.1 | 17.9 | 24.1 | 29.7 | 21.1 |
| % low-skilled | 17.9 | 21.4 | 3.6 | 17.1 | 10.0 | 15.7 | 21.0 | 31.2 | 36.9 | 15.3 | 6.1 | 19.9 | 22.0 | 12.9 | 7.8 | 38.8 | 10.5 | 47.1 | 20.0 | 16.1 | 7.2 | 58.8 | 39.1 | 10.7 | 2.4 | 17.5 | 10.9 | 47.2 |
| % medium-skilled | 39.0 | 56.1 | 77.4 | 49.0 | 60.6 | 56.6 | 33.7 | 44.2 | 23.6 | 55.4 | 51.3 | 44.0 | 41.9 | 59.9 | 57.7 | 34.3 | 61.4 | 29.0 | 39.5 | 56.1 | 64.7 | 23.0 | 50.0 | 58.4 | 71.9 | 53.2 | 44.2 | 25.7 |
| % high-skilled | 43.1 | 22.4 | 19.0 | 33.9 | 29.4 | 27.7 | 45.4 | 24.6 | 39.6 | 29.3 | 42.6 | 36.2 | 36.2 | 27.2 | 34.5 | 26.9 | 28.2 | 24.0 | 40.5 | 27.8 | 28.1 | 18.2 | 10.8 | 30.9 | 25.6 | 29.3 | 44.9 | 27.2 |
| % employee | 85.6 | 72.8 | 65.7 | 96.5 | 94.8 | 96.6 | 84.0 | 39.9 | 75.3 | 92.1 | 82.1 | 63.0 | 88.0 | 94.2 | 84.8 | 93.8 | 75.9 | 89.7 | 96.9 | 90.1 | 82.4 | 92.9 | 68.3 | 84.4 | 70.9 | 88.1 | 93.8 | 87.5 |
| % self-employed | 14.4 | 27.2 | 34.3 | 3.5 | 5.2 | 3.4 | 16.0 | 60.1 | 24.7 | 7.9 | 17.9 | 35.5 | 12.0 | 5.8 | 15.2 | 6.2 | 24.1 | 10.3 | 3.1 | 9.9 | 17.6 | 7.1 | 31.7 | 15.6 | 29.1 | 11.9 | 6.2 | 12.5 |
| % main earner | 89.8 | 73.0 | 72.4 | 74.9 | 75.9 | 67.0 | 72.5 | 77.6 | 79.5 | 76.6 | 60.4 | 69.0 | 82.2 | 95.8 | 78.1 | 90.8 | 57.6 | 57.8 | 84.2 | 83.0 | 67.7 | 87.6 | 73.1 | 79.1 | 67.6 | 77.7 | 89.8 | 85.4 |
| % secondary earner | 10.2 | 27.0 | 27.6 | 25.1 | 24.1 | 33.0 | 27.5 | 22.4 | 20.5 | 23.4 | 39.6 | 31.0 | 17.8 | 4.2 | 21.9 | 9.2 | 42.4 | 42.2 | 15.8 | 17.0 | 32.3 | 12.4 | 26.9 | 20.9 | 32.4 | 22.3 | 10.2 | 14.6 |
| % part-timer | 16.3 | 7.8 | 7.1 | 11.8 | 14.0 | 13.5 | 34.8 | 23.3 | 19.7 | 11.6 | 4.5 | 5.7 | 13.4 | 11.2 | 8.5 | 13.4 | 9.2 | 7.4 | 23.1 | 17.9 | 6.6 | 6.1 | 6.7 | 9.4 | 3.0 | 26.7 | 6.0 | 18.3 |
| % earnings Q1 | 29.5 | 18.2 | 27.8 | 24.7 | 21.3 | 37.1 | 28.4 | 38.5 | 18.8 | 12.8 | 12.8 | 6.1 | 15.3 | 21.1 | 22.1 | 17.6 | 20.7 | 21.9 | 18.2 | 27.6 | 16.5 | 17.9 | 32.2 | 22.8 | 19.8 | 42.1 | 13.8 | 19.4 |
| % earnings Q2 | 20.1 | 25.7 | 20.6 | 24.8 | 28.2 | 34.6 | 27.1 | 18.0 | 22.6 | 26.7 | 12.3 | 11.4 | 20.6 | 26.3 | 20.4 | 24.4 | 23.7 | 24.0 | 17.6 | 21.7 | 20.5 | 23.1 | 24.1 | 23.2 | 16.8 | 26.2 | 14.7 | 17.7 |
| % earnings Q3 | 17.5 | 21.6 | 18.1 | 24.0 | 21.3 | 15.2 | 13.4 | 14.1 | 20.5 | 27.9 | 8.8 | 11.1 | 20.4 | 19.7 | 18.8 | 23.6 | 20.2 | 22.3 | 14.0 | 21.2 | 22.7 | 20.4 | 20.4 | 18.6 | 22.5 | 13.5 | 12.8 | 19.9 |
| % earnings Q4 | 17.5 | 16.3 | 16.7 | 18.2 | 17.7 | 9.7 | 12.4 | 14.4 | 17.5 | 21.1 | 21.9 | 21.0 | 20.4 | 18.3 | 17.9 | 16.6 | 20.2 | 16.0 | 13.4 | 18.5 | 23.1 | 18.7 | 17.7 | 15.1 | 21.1 | 10.3 | 12.3 | 19.3 |
| % earnings Q5 | 15.4 | 18.2 | 16.8 | 8.3 | 11.5 | 3.3 | 18.6 | 14.9 | 20.7 | 11.5 | 44.2 | 50.4 | 23.4 | 14.6 | 20.8 | 17.7 | 15.2 | 15.7 | 36.8 | 11.0 | 17.2 | 19.9 | 5.6 | 20.4 | 19.8 | 7.9 | 46.4 | 23.7 |
| threshold | 57.1 | 26.4 | 37.3 | 59.8 | 50.8 | 36.8 | 52.6 | 51.3 | 34.3 | 46.4 | 32.3 | 30.0 | 24.8 | 34.3 | 26.9 | 50.6 | 41.4 | 30.5 | 34.9 | 54.0 | 35.7 | 44.0 | 34.8 | 43.6 | 37.0 | 61.9 | 31.2 | 39.4 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income."Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A10: Characteristics of the population facing METRs above 120% of the median in each country in 2017

| | BE | BG | CZ | DK | DE | EE | IE | EL | ES | FR | HR | IT | CY | LV | LT | LU | HU | MT | NL | AT | PL | PT | RO | SI | SK | FI | SE | UK |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|-------|------|
| Sample size | 603 | 471 | 495 | 1983 | 1169 | 160 | 401 | 2156 | 3247 | 2138 | 2536 | 2408 | 2174 | 88 | 70 | 420 | 397 | 1110 | 667 | 518 | 1136 | 1371 | 591 | 1680 | 1392 | 1392 | 2,362 | 5232 |
| % sample | 11.5 | 9.5 | 8.1 | 28.5 | 11.1 | 2.5 | 8.6 | 20.4 | 25.1 | 22.1 | 47.0 | 14.7 | 43.3 | 1.4 | 2.2 | 11.5 | 7.6 | 25.7 | 9.6 | 9.5 | 9.8 | 17.7 | 8.6 | 17.3 | 22.8 | 9.5 | 37.8 | 29.6 |
| % male | 49.3 | 65.7 | 64.0 | 64.3 | 36.3 | 57.2 | 48.4 | 72.8 | 58.6 | 55.0 | 55.8 | 67.5 | 56.9 | 42.0 | 66.4 | 48.4 | 62.6 | 60.3 | 63.1 | 52.2 | 47.7 | 50.0 | 70.1 | 60.3 | 47.8 | 65.4 | 63.3 | 60.2 |
| % female | 50.7 | 34.3 | 36.0 | 35.7 | 63.7 | 42.8 | 51.6 | 27.2 | 41.4 | 45.0 | 44.2 | 32.5 | 43.1 | 58.0 | 33.6 | 51.6 | 37.4 | 39.7 | 36.9 | 47.8 | 52.3 | 50.0 | 29.9 | 39.7 | 52.2 | 34.6 | 36.7 | 39.8 |
| % age (<30) | 32.0 | 10.7 | 8.3 | 9.0 | 18.4 | 19.6 | 6.8 | 2.7 | 7.1 | 26.4 | 15.3 | 6.4 | 9.5 | 14.2 | 38.9 | 13.8 | 9.7 | 33.6 | 36.7 | 20.8 | 20.3 | 7.2 | 24.3 | 9.7 | 16.2 | 26.1 | 6.3 | 11.6 |
| % age (30-50) | 53.4 | 57.5 | 62.2 | 59.3 | 51.3 | 54.2 | 66.5 | 63.9 | 61.6 | 52.5 | 56.4 | 67.0 | 65.3 | 57.6 | 52.0 | 64.9 | 62.8 | 49.8 | 45.8 | 54.0 | 60.2 | 66.7 | 54.8 | 66.7 | 62.6 | 45.9 | 60.0 | 64.8 |
| % age (50+) | 14.6 | 31.8 | 29.5 | 31.7 | 30.3 | 26.3 | 26.7 | 33.5 | 31.3 | 21.1 | 28.3 | 26.6 | 25.2 | 28.2 | 9.1 | 21.3 | 27.5 | 16.6 | 17.5 | 25.2 | 19.5 | 26.1 | 20.9 | 23.6 | 21.2 | 28.0 | 33.7 | 23.6 |
| % low-skilled | 20.3 | 21.8 | 4.9 | 10.4 | 15.7 | 14.2 | 22.3 | 13.2 | 17.0 | 16.1 | 4.8 | 27.3 | 14.3 | 35.4 | 24.3 | 40.9 | 5.5 | 38.8 | 26.6 | 15.9 | 11.0 | 22.5 | 54.9 | 9.6 | 3.0 | 12.1 | 8.2 | 42.9 |
| % medium-skilled | 50.1 | 48.0 | 75.0 | 36.1 | 57.3 | 59.1 | 22.5 | 36.6 | 21.2 | 53.4 | 58.6 | 44.6 | 34.6 | 54.1 | 66.2 | 36.6 | 60.0 | 33.2 | 49.2 | 48.1 | 60.8 | 23.7 | 41.8 | 49.5 | 77.0 | 36.2 | 40.5 | 23.3 |
| % high-skilled | 29.6 | 30.2 | 20.1 | 53.4 | 27.0 | 26.8 | 55.2 | 50.2 | 61.9 | 30.5 | 36.5 | 28.1 | 51.1 | 10.4 | 9.5 | 22.5 | 34.5 | 28.0 | 24.2 | 36.0 | 28.3 | 53.9 | 3.3 | 40.9 | 20.0 | 51.7 | 51.3 | 33.8 |
| % employee | 94.9 | 17.0 | 34.2 | 95.5 | 91.4 | 80.1 | 93.6 | 42.4 | 95.9 | 89.1 | 93.4 | 75.8 | 91.9 | 83.9 | 100.0 | 86.5 | 44.8 | 91.4 | 95.4 | 72.5 | 97.0 | 97.9 | 38.7 | 87.1 | 57.5 | 90.0 | 94.9 | 85.1 |
| % self-employed | 5.1 | 83.0 | 65.8 | 4.5 | 8.6 | 19.9 | 6.4 | 57.6 | 4.1 | 10.9 | 6.6 | 24.0 | 8.1 | 16.1 | 0.0 | 13.5 | 55.2 | 8.6 | 4.6 | 27.5 | 3.0 | 2.1 | 61.3 | 12.9 | 42.5 | 10.0 | 5.1 | 14.9 |
| % main earner | 54.7 | 64.9 | 79.5 | 87.8 | 60.3 | 85.5 | 80.3 | 90.6 | 74.6 | 72.2 | 62.6 | 82.0 | 76.8 | 82.5 | 82.3 | 68.7 | 68.6 | 58.6 | 80.8 | 68.4 | 53.2 | 68.1 | 62.5 | 77.3 | 50.4 | 81.7 | 83.5 | 85.4 |
| % secondary earner | 45.3 | 35.1 | 20.5 | 12.2 | 39.7 | 14.5 | 19.7 | 9.4 | 25.4 | 27.8 | 37.4 | 18.0 | 23.2 | 17.5 | 17.7 | 31.3 | 31.4 | 41.4 | 19.2 | 31.6 | 46.8 | 31.9 | 37.5 | 22.7 | 49.6 | 18.3 | 16.5 | 14.6 |
| % part-timer | 10.9 | 12.5 | 6.1 | 5.3 | 38.2 | 20.5 | 35.6 | 3.9 | 7.9 | 19.4 | 0.7 | 5.1 | 9.4 | 41.5 | 31.8 | 28.2 | 3.5 | 5.0 | 31.4 | 30.1 | 18.1 | 3.9 | 15.8 | 7.8 | 4.2 | 25.9 | 4.3 | 19.1 |
| % earnings Q1 | 23.8 | 29.2 | 18.3 | 8.3 | 50.2 | 68.3 | 17.3 | 2.2 | 2.3 | 26.6 | 0.6 | 1.8 | 14.0 | 94.8 | 89.8 | 37.1 | 5.0 | 8.2 | 26.3 | 33.9 | 45.0 | 9.6 | 61.4 | 16.3 | 39.3 | 37.3 | 9.3 | 20.9 |
| % earnings Q2 | 71.1 | 15.2 | 18.9 | 9.8 | 24.0 | 8.4 | 27.4 | 1.1 | 6.0 | 30.1 | 4.8 | 4.6 | 6.5 | 2.1 | 2.8 | 29.6 | 16.0 | 8.1 | 26.3 | 35.4 | 24.0 | 6.9 | 4.1 | 26.7 | 22.9 | 9.2 | 5.2 | 17.5 |
| % earnings Q3 | 3.5 | 15.8 | 6.1 | 9.5 | 10.1 | 10.8 | 16.4 | 4.7 | 18.6 | 16.4 | 24.6 | 8.4 | 2.1 | 0.0 | 7.4 | 12.6 | 25.7 | 53.3 | 40.4 | 6.9 | 7.3 | 3.9 | 14.7 | 11.4 | 9.4 | 2.2 | 3.5 | 10.1 |
| % earnings Q4 | 1.2 | 16.0 | 20.8 | 7.5 | 10.5 | 2.3 | 15.0 | 20.7 | 11.8 | 10.7 | 28.5 | 48.7 | 28.5 | 0.0 | 0.0 | 14.7 | 18.7 | 17.3 | 5.9 | 10.9 | 6.4 | 12.7 | 16.5 | 7.1 | 9.7 | 2.9 | 27.2 | 4.7 |
| % earnings Q5 | 0.4 | 23.9 | 35.8 | 64.9 | 5.2 | 10.1 | 23.8 | 71.2 | 61.4 | 16.1 | 41.6 | 36.6 | 49.0 | 3.1 | 0.0 | 6.0 | 34.6 | 13.2 | 1.1 | 12.9 | 17.3 | 66.9 | 3.2 | 38.5 | 18.6 | 48.4 | 54.8 | 46.7 |
| threshold | 66.3 | 26.4 | 37.3 | 51.4 | 53.4 | 27.5 | 60.0 | 43.3 | 34.6 | 44.5 | 24.0 | 52.1 | 15.8 | 37.3 | 37.8 | 52.2 | 41.4 | 30.0 | 59.0 | 51.9 | 36.4 | 43.0 | 35.8 | 46.3 | 35.8 | 56.2 | 38.8 | 41.3 |

Note: "Low-skilled" refers to lower secondary education or below, "medium-skilled" to upper and post secondary education and "high-skilled" to tertiary education. "Self-employed" are defined as those with self-employment income, who do not have employment income."Part-time" is defined as working less than 30 hours per week. "Main earner" is the individual with the highest earnings in the household.

Source: own calculations using EUROMOD version H1.0.

Table A11: Probit results for facing low work incentives using an absolute threshold in 2017

| | Coefficients | | | Marginal effects (dy/dx) | | |
|------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|-------------------|
| | A. Short-term PTR | B. Long-term PTR | C. METR | A. Short-term PTR | B. Long-term PTR | C. METR |
| Men | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| Women | -0.049*** (0.000) | -0.128*** (0.000) | 0.013*** (0.000) | -0.011*** (0.000) | -0.029*** (0.000) | 0.003*** (0.000) |
| <30 | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| 30-50 | 0.320*** (0.000) | -0.063*** (0.000) | 0.103*** (0.000) | 0.072*** (0.000) | -0.015*** (0.000) | 0.021*** (0.000) |
| 50+ | 0.350*** (0.000) | -0.264*** (0.000) | -0.021*** (0.000) | 0.079*** (0.000) | -0.059*** (0.000) | -0.004*** (0.000) |
| low-skilled | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| medium-skilled | -0.108*** (0.000) | -0.095*** (0.000) | -0.076*** (0.000) | -0.026*** (0.000) | -0.023*** (0.000) | -0.016*** (0.000) |
| high-skilled | -0.128*** (0.000) | -0.183*** (0.000) | -0.124*** (0.000) | -0.031*** (0.000) | -0.042*** (0.000) | -0.026*** (0.000) |
| employed | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| self-employed | -0.508*** (0.000) | 0.522*** (0.000) | 0.234*** (0.000) | -0.111*** (0.000) | 0.136*** (0.000) | 0.052*** (0.000) |
| main earner | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| secondary earner | -0.060*** (0.000) | -0.725*** (0.000) | -0.368*** (0.000) | -0.014*** (0.000) | -0.155*** (0.000) | -0.072*** (0.000) |
| full-time | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| part-time | -0.117*** (0.000) | -0.118*** (0.000) | 0.116*** (0.000) | -0.027*** (0.000) | -0.026*** (0.000) | 0.025*** (0.000) |
| Q1 | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) | 0.000 (.) |
| Q2 | -0.202*** (0.000) | -0.220*** (0.000) | -0.296*** (0.000) | -0.052*** (0.000) | -0.064*** (0.000) | -0.066*** (0.000) |
| Q3 | -0.423*** (0.000) | -0.534*** (0.000) | -0.557*** (0.000) | -0.104*** (0.000) | -0.146*** (0.000) | -0.112*** (0.000) |
| Q4 | -0.399*** (0.000) | -0.828*** (0.000) | -0.291*** (0.000) | -0.099*** (0.000) | -0.208*** (0.000) | -0.065*** (0.000) |
| Q5 | -0.511*** (0.000) | -1.055*** (0.000) | -0.099*** (0.000) | -0.124*** (0.000) | -0.246*** (0.000) | -0.024*** (0.000) |
| Observations | 223,614 | 223,614 | 223,614 | 223,614 | 223,614 | 223,614 |
| Pseudo R-squared | 0.302 | 0.182 | 0.168 | | | |

Note: Standard errors in parentheses. * p<0.05 ** p<0.01 *** p<0.001. Including country-fixed effects. dy/dx refers to the discrete change from the base level. Absolute threshold refers to 75% for short-term PTR and 50% for long-term PTR and METR.

Source: own calculations using EUROMOD version H1.0.