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Improving poverty reduction in Europe: what works best where?

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Abstract

We provide evidence of the relative cost-effectiveness of different types of policy instrument in reducing poverty or limiting its increase, comparing within and between seven diverse EU countries. We do that by measuring the implications of increasing/reducing the instrument size within its national context, using microsimulation methods. We consider commonly-applied policy instruments with a direct effect on household income: child benefits, minimum income components of social assistance, income tax lower thresholds and minimum wages and a benchmark case of changing the size of the whole tax-benefit system. We find that the assessment of the most cost-effective instrument may depend on the measure of poverty used and the direction and scale of the change. Nevertheless, our results indicate that the options that reduce poverty most cost-effectively in most countries are increasing child benefits and social assistance while reducing the former is a particularly poverty-increasing way of making budgetary cuts.

JEL: D13, D30, H53, I38

Keywords: Poverty, EU, social policy, fiscal policy, microsimulation

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1 Introduction

Combating poverty is a high-priority objective in all European Union (EU) countries. However, income poverty remains persistently high or is rising in many of them and the EU2020 targets for poverty reduction seem unattainable (Eurostat, 2015). It is clear that in order to move towards the targets in a convincing way there is need for increased and differently-allocated public spending. However, in the context of the recovery from the economic crisis, or its persistence in some countries, budgetary retrenchment remains on the agenda. Policies that reduce spending or raise taxes have implications for poverty and the sensitivity of these important outcomes to the policy design is a key issue (Avram et al., 2013).

The effectiveness of policies in reducing poverty depends on the environment in which they operate. This applies firstly to the characteristics of the population for whom they are intended and the macroeconomic conditions of the time (Atkinson, 2009). Secondly, the effectiveness of particular policy instruments naturally depends on the specifics of their design. Thirdly, it depends on how people react to policies. For example, targeting resources on those with low incomes may appear efficient for poverty reduction but is less so if means-testing results in incomplete benefit take-up or if benefits reduce the financial incentive to work for the recipient or others in their household. Finally, effectiveness in reducing poverty depends on the scale of the policy instrument. Studies have questioned how much "size matters" relative to design, mostly in relation to family policies (e.g. Matsaganis et al. (2006) for southern European countries, Levy et al. (2007) for Austria, Spain and the UK, Notten and Gassmann (2008) for Russia, Salanauskaite and Verbist (2013) for Lithuania and four other post-2004 EU member states, and Popova (2016) for Russia in comparison with four western European countries). Most find that size is the most important aspect but that specific design features may be particularly effective within their national contexts.

To provide better understanding of the issue, this paper examines in a systematic and comprehensive manner the relationship between poverty and the size of tax-benefit policies. We provide evidence on the relative effectiveness of different types of policy instrument in reducing the risk of poverty (or limiting its increase) by measuring the implications of increasing or reducing the size of the instrument within its national context. We compare across seven EU countries chosen for their diversity of tax-benefit systems and economic situation: Belgium, Bulgaria, Estonia, Greece, Hungary, Italy and the UK.

Our contribution to the existing literature is twofold. First, our analysis compares across types of policy instrument within and between countries rather than focusing on one type of policy. The four policy instruments considered are child benefits, minimum income components of social assistance, income tax lower thresholds and minimum wages. Secondly, we establish how our measure of effectiveness depends on the scale of the policy change, given its design and national context. In addition, we provide some country-specific pointers for practical policy reform to improve poverty reduction.

We employ an indicator of cost-effectiveness, defined as the ratio of the percentage point change in poverty (headcount or gap) to the net cost to the public budget, expressed as a proportion of GDP.[1] Using microsimulation techniques we experiment with the scale of the instruments for a wide range

[1] This is closely related to measures of target efficiency developed by Beckerman (1979).

of increases and decreases. We use EUROMOD, the tax-benefit microsimulation model for the European Union, which provides a unique opportunity to calculate with precision and cross-country comparability the net effects of policy changes, taking into account the complex interactions within and between the tax-benefit policies as well as the heterogeneity of population characteristics.

The paper is structured as follows. Section 2 describes the rationale for choosing the policy instruments and explains how they are scaled up and down. Section 3 explains the methodology that is used. Section 4 presents our estimates of the effect of changes to each of the policy instruments on poverty and compares cost-effectiveness across countries and instruments. Section 5 concludes by summarising the most important findings, and by reflecting on the policy implications of this analysis.

2 The policy instruments

The instruments we focus on have been chosen based on two criteria. First, they are commonly considered as components of reform strategies to reduce income poverty (or restrain its growth). Second, they already exist in most of the countries studied, and hence are suitable for consideration in a comparative context.

We explore the relative cost-effectiveness of expanding/contracting existing policies, while assessing differences across instruments within countries and across countries for each instrument. We consider how cost-effectiveness depends on the scale of the instrument by expanding/contracting relevant monetary levels and thresholds by common percentages: 5%, 20%, 50%, 70% and 90%.[2] The baseline year for our analysis is 2013.

[2] We choose not to show the effects of abolishing instruments entirely because in some policy systems receipt of a particular benefit acts as a passport to entitlement to other benefits or as an alternative to receipt of other benefits. Invoking these effects would distract from our focus on the effectiveness of particular instruments.

TABLE 1: POLICY INSTRUMENTS: EXISTING GROSS LEVELS AS A PERCENTAGE OF MEDIAN EQUIVALENT HOUSEHOLD DISPOSABLE INCOME 2013

		Belgium	Bulgaria	Estonia	Greece	Italy	Hungary	UK
Child benefits	Mean for recipients %	19.2	10.3	7.9	6.0	8.6	27.5	24.5
	% households receiving	25.5	8.8	18.3	20.1	13.5	22.7	18.4
Social Assistance Benefits	Mean for recipients %	26.6	12.1	19.6	-	-	8.0	26.5
	% households receiving	1.9	7.4	2.3	-	-	13.1	6.4
Income tax threshold	Threshold level %	34.1	-	26.2	52.2	51.9	-	54.3
Minimum Wage	Monthly, for full time prime age worker %	91.4	54.1	58.2	73.4	-	95.2	70.3
Median equivalised household disposable income EUR/month		*1,707*	*293*	*550*	*798*	*1,285*	*360*	*1,450*

Source: Authors' calculations using EUROMOD with EU-SILC.
Notes: Household disposable income is equivalised using the modified OECD scale. Minimum wages assume (BE) full-time worker aged 20+ with at least 1 year of work experience; (EL) single, full-time worker aged 25+ with 0-3 years of work experience; (UK) age 22+, full time worker (38 hours). Euro exchange rates: BG 1.956BGN; HU 286.0HUF; UK 0.8553GBP.

2.1 Child benefits

We expect increasing the size of child benefits to contribute to reducing poverty among households with children. The extent of the effect depends on the design of the benefit; whether or not benefit entitlements depend on the age and number of children, and how they impact on the particular households with children below the poverty line (Bradshaw, 2006). If the benefit is universal it may appear to be less cost-effective in terms of poverty reduction than a benefit targeted on low income families, but it will have the advantages of high take-up and political support (Matsaganis et al., 2006; Notten and Gassmann, 2008; Levy et al., 2013).

We focus on cash benefits specifically targeted at children. Per-child and per-family amounts in universal and means-tested child benefits are adjusted.[3] In the case of means-tested child benefits income thresholds are not adjusted, so the number of beneficiaries remains unchanged. We do not adjust maternity and parental benefits or child-contingent components of adult out-of-work/in-work or housing benefits, nor support for children channeled through the personal income tax system, which is considerable in Hungary.[4]

[3] The benefits that are adjusted here are as follows: **Belgium**: child allowance, birth allowance; **Bulgaria**: non-means-tested benefit for twins, non-means-tested child benefit for mothers in tertiary education, child benefit for education, birth grant, means-tested child benefit; **Estonia**: child allowance, childcare allowance, parental allowance for families with 7+ children, childbirth allowance; **Greece**: child benefit, large family benefit; **Italy**: family allowances for lone parents, two parents and for families with at least 3 children; **Hungary**: regular child protection benefit, birth grant, child raising support, child care allowance, family allowance; **UK**: child benefit, child tax credit.

[4] Figari et al. (2011) analyse the impact of the whole package of child contingent incomes.

For the instruments we consider, Table 1 shows how the average value compares with median equivalised household disposable income and the proportion of all households relying on the instrument (in the case of benefits only) in each country. Child benefits are relatively generous in Hungary, the UK and to a lesser extent in Belgium. They are smallest in Greece, Estonia and Italy and in Bulgaria only a minority of households with children is entitled.

2.2 Social Assistance

Expanding the generosity of cash social assistance schemes is an effective way of increasing the income of existing recipients, and may also draw in more people who have incomes that previously made them ineligible. However, the poverty effect of increasing the social assistance level depends not only on the level relative to the poverty threshold and if conditions of entitlement exclude some people by design (Figari et al., 2013; Van Mechelen and Marchal, 2013) but also on non take-up of the benefits due to stigma, mis-administration or other reasons (Eurofound, 2015).

Table 1 shows that these benefits are relatively generous in the UK and Belgium and in the latter case the prevalence is relatively low. The prevalence is the highest in Hungary but the average benefit payment is the lowest among the five countries with any social assistance.[5] There was no national cash social assistance in Greece or Italy in 2013.[6]

2.3 Income tax threshold

Raising the income level at which people become liable for income tax is a way of increasing their net income that could in principle take them out of poverty or reduce the poverty gap. However, this depends on the relationship between the tax and poverty thresholds. If the tax threshold is already high there may be few people in poor households who are liable for income tax.

Bulgaria and Hungary are not included in this part of the analysis as they have a flat tax without an income-exemption limit. In Italy, where tax credits operate instead of income exemptions, the amounts of these tax credits are increased/decreased instead. In Greece in 2013 there was no zero-rate band or equivalent but the system of 2012 included this component. Our simulations first re-introduce that and then explore the effect of amending it.

Table 1 shows that the threshold varies greatly: in Estonia it is half the size of that in Greece, Italy and the UK.

[5] The specific benefits that are included are: **Belgium**: income support, **Bulgaria**: guaranteed minimum income; **Estonia**: subsistence benefit; **Hungary**: social assistance; **UK**: income support, income-based jobseeker's allowance. In our simulations the maximum levels of benefit or subsistence thresholds applying to working aged people and dependent children are inflated or deflated and no changes are made to assistance levels for elderly people unless there is a single rate for all adults.

[6] See World Bank (2015) and Ravigli (2015), respectively, for analysis of the effects of potential schemes in these two countries.

2.4 Minimum wage

Increasing the minimum wage might be viewed as a very effective way to increase the incomes of those already in paid work, especially since working on the minimum wage is by no means a guarantee of income above the poverty threshold (Marchal and Marx, 2015). However, the extent of the poverty effect of increasing the minimum wage level depends firstly on where in the income distribution low-paid individuals are located. Secondly, the gain from an increase in wages may be mitigated by liability for income tax and social insurance contributions (SIC) on the extra income, and in countries where they exist (Belgium and the UK), by reductions in entitlements to in-work benefits.

We do not explore the effect of lowering the minimum wages below their 2013 levels because this would require assumptions about wage levels for those earning between the existing minimum wage and the reduced level. It would be particularly unrealistic to assume that they would all see their earnings fall to the reduced minimum level.[7]

Italy is not included in this part of the analysis as it has no minimum wage policy. For the remaining countries Table 1 shows that the minimum wage is largest in Hungary and Belgium and smallest in Bulgaria and Estonia.

2.5 The whole system

To provide a benchmark against which to compare the effects of individual policy instruments, we consider what happens to poverty indicators if all monetary levels and thresholds in the systems of direct taxes and cash benefits are increased/decreased. One might expect comprehensive whole-system changes to be less closely targeted on low income households than some of the individual policy instruments that we consider. The effect depends on the salience of monetary levels, amounts and thresholds in the tax-benefit system and where in the income distribution these thresholds apply.[8] It may therefore differ across countries and our analysis throws some light on this issue.

3 Methodology and data

3.1 Model, data and assumptions

We use the tax-benefit model EUROMOD and household micro-data on gross incomes, labour market status and other characteristics of individuals and households from the 2010 European Union Statistics on Income and Living Conditions (EU-SILC) for Belgium, Bulgaria, Estonia, Greece, Italy and Hungary. For the UK, the 2009/10 Family Resources Survey (FRS) is used. Gross market incomes are updated from the micro-data income reference period (2009) to the target period (2013) using appropriate indexes for each income source. Using EUROMOD, country-specific tax and benefit rules for 2013 (as at 30th June) are applied to these data in order to simulate liabilities for direct taxes and

[7] This does not mean that minimum wage reductions do not occur in practice. For example, in 2012 the Greek government imposed a 22% cut on the standard minimum wage; 32% for those under the age of 25.

[8] For related analysis on the UK see Sutherland et al. (2008) and on the same 7 countries, Hills et al. (2014).

SIC and cash benefit entitlements. Information on income components that cannot be calculated by EUROMOD is taken directly from the data and updated to 2013, along with market incomes.[9] No adjustments are made for economic or demographic changes in the period 2009-13.

We assume full compliance with minimum wage legislation. If wages as calculated from monthly earnings and weekly hours in the data are lower than the legislated minimum wage level in 2013 they are increased to this level.[10]

Non-take-up of means-tested benefits is an important phenomenon to account for in evaluating their distributional properties. In the case of non-take-up of social assistance and means-tested child benefits, their poverty effect would be overestimated if full take-up were assumed. In EUROMOD we make adjustments for benefit non-take-up where there is relevant information: to social assistance benefits in Belgium and Estonia and all means-tested benefits and tax credits in the UK (Leventi and Vujackov, 2016).

EUROMOD has been validated both at the micro and macro level and has been used to address a wide range of economic and social policy research questions (see Sutherland and Figari (2013) and Figari et al. (2015)).

When changes to a particular instrument are simulated this may affect other benefit entitlements or tax liabilities. These and other interactions are taken into account as it is the net effect on household income that is relevant.

We assume no change in take-up probability in the case of our simulated reforms and we do not attempt to capture behavioral reactions to policy changes. For example, in the case of the minimum wage simulations, it is assumed that there are no effects on the earnings distribution for those earning above the new higher minimum levels, on hours worked, job-seeking and job acceptance behavior, or the supply of relatively low paid jobs

Finally, the policy scenarios are not revenue-neutral, by design, because the point is to measure the budgetary cost. Any financing mechanism would itself have distributional and behavioural effects.

3.2 Evaluating the results

We measure effectiveness of the policy instruments according to their impact on income poverty measured using a fixed threshold of 60% of the national median household disposable income in 2013, equivalised using the modified OECD scale. We use the poverty headcount (FGT0) and the normalised poverty gap ratio (FGT1) equal to the average poverty gap expressed as a ratio of the poverty line (Foster et al., 1984).

We evaluate the change in poverty in relation to the change in net budgetary cost to the public finances. We use as an indicator of cost-effectiveness the ratio of the percentage point change in

[9] Non-simulated components are typically contributory pensions and maternity benefits and disability benefits. They are not simulated because of insufficient information in the household micro-data about work history or disability status to calculate eligibility or size of entitlement.

[10] This treatment is consistent with an assumption that wages that are observed in the data as lower than the prevailing minimum wage are due to under-reporting of weekly or monthly earnings. Other causes could be over-reporting of hours of work or working in the grey economy for non-compliant employers.

poverty (headcount or gap) to the change in net budgetary cost (spending on cash benefits less revenue from direct taxes and SIC), expressed as a proportion of GDP. This provides a metric that can be compared across most of the policy instruments and across countries.

This metric is not appropriate in the case of the minimum wage where the first round cost of an increase falls on employers rather than on the public budget.[11] Generally an increase in minimum wage implies a budgetary gain to the public finances because of the increased revenue from income tax and SIC and, in some countries, reduced benefit entitlements. To factor in the costs of a minimum wage increase we use the percentage of GDP that the increase in direct employer costs (gross earnings and employer SIC) represents, and assess the relative effects on poverty in each country against this indication of the size of the intervention.

4 Results

The effect of changes to the four policy instruments on the poverty headcount and gap are shown in Tables 2 and 3 respectively. Results are shown for the 5%, 20% and 90% increases/decreases only, for reasons of brevity. These are discussed policy-by-policy and in relation to their budgetary implications (shown graphically in Figures 1 to 4), and also relative to changing the whole systems (Figure 5), followed by an assessment of the relative cost-effectiveness of the instruments within and across countries (Table 4).

4.1 Child benefits

As shown in Table 2, increasing child benefits by 20% has a modest effect on the poverty headcount, lowering it by 1.4 percentage points (pp) in the UK, 1.1pp in Hungary and 1.0pp in Belgium, the countries with the largest child benefit systems but by much less in the other countries. An increase of 90% would result in a reduction of the headcount by at least 1pp in all countries, with large inroads in Hungary (4.7pp), the UK (3.5pp) and Belgium (3.4pp). The same three countries show the largest effects on the poverty gap (Table 3). The size of the poverty effect is mainly driven by the absolute size of the benefit change, which depends on the scale of child benefits in the actual 2013 system. Figure 1a shows that in most countries the effect on the poverty headcount is broadly proportional to the scale of the change in child benefits spending (measured in terms of percent of GDP), both for increases and decreases: the lines are straight and the effects are symmetrical for increases and decreases. An exception is the UK where the effect becomes proportionately smaller (larger) for larger increases (reductions) in spending.

[11] The extent to which these are public sector employers will have a direct impact on the public finance implications. This is not possible to analyse with the EU-SILC data and so is beyond the scope of this analysis.

TABLE 2: CHANGE IN POVERTY HEADCOUNT RATIO

Country	2013 baseline (%)	change between 2013 and policy scenario (in percentage points)					
		decrease by …			increase by ...		
		90%	20%	5%	5%	20%	90%
Child benefits							
BE	11.8	3.3 ***	0.9 ***	0.2 ***	-0.1 **	-1.0 ***	-3.4 ***
BG	19.1	1.1 ***	0.4 **	0.0	0.0 ***	-0.2 **	-1.2 ***
EE	17.4	1.4 ***	0.3 ***	0.0	-0.1 *	-0.2 **	-1.3 ***
EL	17.6	1.0 ***	0.5 **	0.1 **	-0.1	-0.3 ***	-1.2 ***
HU	14.4	4.9 ***	1.1 ***	0.2 ***	-0.2 ***	-1.1 ***	-4.7 ***
IT	18.3	1.7 ***	0.4 ***	0.1 ***	0.0	-0.2 ***	-1.1 ***
UK	15.3	7.9 ***	2.0 ***	0.5 ***	-0.4 ***	-1.4 ***	-3.5 ***
Social Assistance							
BE	11.8	0.4 ***	0.2 ***	0.0 *	-0.2 ***	-0.8 ***	-3.4 ***
BG	19.1	0.5 ***	0.3 ***	0.1	-0.1	-0.1 *	-1.5 ***
EE	17.4	0.0 ***	0.0 ***	0.0 ***	0.0 ***	0.0 ***	-0.2 **
EL	17.6						
HU	14.4	0.6 ***	0.0 **	0.0 **	0.0	-0.1 **	-0.5 ***
IT	18.3						
UK	15.3	4.0 ***	1.1 ***	0.3 *	-0.3 ***	-1.2 ***	-4.1 ***
Income tax threshold							
BE	11.8	3.2 ***	0.6 ***	0.1	-0.1 **	-0.3 ***	-0.6 ***
BG	19.1						
EE	17.4	7.5 ***	1.9 ***	0.4	-0.2 **	-0.4 ***	-1.4 ***
EL	18.1	1.6 ***	0.1	0.0 *	0.0	-0.1 **	-0.3 ***
HU	14.4						
IT	18.3	3.6 ***	0.6 ***	0.2 *	-0.1 ***	-0.5 ***	-1.3 ***
UK	15.3	3.8 ***	0.5 ***	0.1 **	-0.1 ***	-0.2 ***	-0.5 ***
Minimum wage							
BE	11.8				0.0	-0.1 **	-1.4 ***
BG	19.1				0.0	-0.1 **	-2.7 ***
EE	17.4				0.0	-0.2 ***	-2.4 ***
EL	17.6				-0.2 *	-0.5 ***	-3.8 ***
HU	14.4				0.0 ***	0.0	-3.9 ***
IT	18.3						
UK	15.3				0.0 **	-0.3 ***	-1.8 ***

Source: Authors' calculations using EUROMOD and EU-SILC.
*Notes: The poverty threshold is 60% of the 2013 baseline median equivalised household disposable income. The baseline value for Greece is slightly different in the income tax threshold scenario because the 2012 tax threshold has been re-introduced. Significance levels indicated as * p<0.1, ** p<0.05, *** p<0.01.*

Looking across countries a key difference is in the gradient of the effect. The poverty rate falls (rises) faster for a given increase (decrease) in child benefit spending in Hungary and in the UK over part of the range, than it does in the other five countries. Child benefits have a higher poverty-reducing cost-effectiveness in these two countries, which does not depend on their existing level in Hungary.

TABLE 3: CHANGE IN POVERTY GAP

Country	2013 baseline (%)	change between 2013 and policy scenario (in percentage points)					
		decrease by …			increase by ...		
		90%	20%	5%	5%	20%	90%
Child benefits							
BE	2.8	1.6 ***	0.3 ***	0.1 ***	-0.1 ***	-0.2 ***	-0.8 ***
BG	5.4	0.5 ***	0.1 ***	0.0 ***	0.0 ***	-0.1 ***	-0.5 ***
EE	4.4	0.5 ***	0.1 ***	0.0 ***	0.0 ***	-0.1 ***	-0.4 ***
EL	5.3	0.6 ***	0.1 ***	0.0 ***	0.0 ***	-0.1 ***	-0.5 ***
HU	3.6	2.9 ***	0.5 ***	0.1 ***	-0.1 ***	-0.4 ***	-1.3 ***
IT	6.7	0.7 ***	0.1 ***	0.0 ***	0.0 ***	-0.1 ***	-0.5 ***
UK	4.5	3.2 ***	0.4 ***	0.1 ***	-0.1 ***	-0.3 ***	-0.8 ***
Social Assistance							
BE	2.8	0.6 ***	0.2 ***	0.1 **	-0.1 ***	-0.2 ***	-0.6 ***
BG	5.4	0.7 ***	0.2 ***	0.1 **	-0.1 ***	-0.2 ***	-1.2 ***
EE	4.4	0.4 ***	0.1 ***	0.0 **	0.0 ***	-0.2 ***	-1.5 ***
EL	5.3						
HU	3.6	0.2 ***	0.0 ***	0.0 ***	0.0 ***	0.0 ***	-0.2 ***
IT	6.7						
UK	4.5	2.0 ***	0.4 ***	0.1 **	-0.1 ***	-0.3 ***	-0.9 ***
Income tax threshold							
BE	2.8	0.6 ***	0.1 ***	0.0 ***	0.0 ***	0.0 ***	-0.1 ***
BG	5.4						
EE	4.4	2.3 ***	0.2 ***	0.0 **	0.0 ***	-0.1 ***	-0.3 ***
EL	5.2	0.6 ***	0.0 ***	0.0 ***	0.0 ***	0.0 ***	-0.1 ***
HU	3.6						
IT	6.7	0.9 ***	0.1 ***	0.0 ***	0.0 ***	-0.1 ***	-0.2 ***
UK	4.5	0.8 ***	0.1 ***	0.0 ***	0.0 ***	-0.1 ***	-0.1 ***
Minimum wage							
BE	2.8				0.0	0.0 ***	-0.2 ***
BG	5.4				0.0 ***	-0.1 ***	-0.7 ***
EE	4.4				0.0 ***	-0.1 ***	-0.5 ***
EL	5.3				0.0 ***	-0.2 ***	-0.9 ***
HU	3.6				0.0 ***	0.0 ***	-0.9 ***
IT	6.7						
UK	4.5				0.0 ***	-0.1 ***	-0.4 ***

Sources and notes: see Table 2.

Figure 1b shows the relationship between child benefit spending and the poverty gap, which is still linear for the four countries with smaller child benefits, with Estonia showing somewhat lower poverty effectiveness (smaller gradient) than Bulgaria, Greece or Italy. This suggests that the relatively small benefits are important for reducing the poverty gap, but even the 90% increase does not succeed in lifting many households above the poverty threshold. The relationships are not linear in Belgium, Hungary or the UK with higher poverty gap reduction effectiveness at lower levels of spending. This can be explained by larger benefits lifting households above the poverty threshold, where they no longer contribute to the poverty gap. This flattening of the curve at higher spending

levels is particularly evident for the UK where increasing child benefits by 90% would imply a poverty gap reduction of less than one fifth, whereas reducing benefits by 90% would imply an increase in poverty gap of 70%. For these three countries over the whole range, poverty gap effectiveness is highest in Hungary and lowest in Belgium, except for very large increases where it is lower in the UK.

4.2 Social Assistance

Figures 2a and 2b show equivalent results for changing social assistance benefit levels. There are some aspects that are in marked contrast to the effects of changing child benefits. First, the scale of the existing systems and hence the effects of proportional expansion/contraction on budgetary cost vary differently across countries. In contrast with its relatively large child benefit payments Hungary has relatively small social assistance payments. The UK and Belgium are the countries with the most costly proportional expansions, because they start with relatively high payments.

Second, the relationship between the poverty effects of benefit decreases and increases is different. Typically, increasing social assistance levels not only increases the income of current recipients but extends entitlement to those with higher income. Depending on the composition of the relevant sections of the income distribution, the budgetary cost of increases could be higher than the budgetary savings from equivalent decreases. Figures 2a and 2b depict this in all five systems with the strongest cases being Estonia and Belgium. In Belgium and Bulgaria the effect on the poverty headcount of reducing social assistance is small, whereas the increase in poverty gap is relatively large, consistent with the finding of Tasseva (2016) for Bulgaria that most social assistance recipients are among those with incomes far below the poverty threshold. In contrast, in the UK reducing social assistance has a substantial effect on the poverty headcount (cutting by 90% results in a 4pp increase), consistent with some existing recipients having incomes above the poverty threshold.

In Estonia the poverty headcount effect of expanding/contracting social assistance is very small and indeed there is no effect except for a 90% expansion (see Table 2). However, the effect on the poverty gap is dramatic, for a relatively small increase in GDP. This is consistent with the Estonian social assistance payments being very low relative to the poverty threshold. Even almost doubling them reduces the poverty gap by 1.5pp: more than in any of the other countries and at much lower cost (see the gradient in Figure 2b). Otherwise the poverty headcount–cost gradients for benefit increases across countries are rather similar to each other but the poverty gap gradients vary more across countries with the effects being largest in Bulgaria (after Estonia) and smallest in Hungary. As with child benefits, in Belgium and the UK the poverty gap effectiveness of social assistance reduces with the size of the benefit, as larger shares of recipients are lifted above the poverty threshold.

4.3 Income tax threshold

The effects of increasing the income tax threshold on either poverty measure (see Figures 3a and 3b) are very small although the budgetary cost is large. For example, spending 1% of GDP in this way (and interpolating linearly where relevant) would reduce the poverty headcount by less than 1pp in all countries except Estonia (where the reduction is a little more). Most people paying income tax, benefiting from this policy change, are in households with income above the poverty threshold. However, the effects are not linear and the gradients are higher for smaller threshold increases,

suggesting that there is scope for modest increases to reduce poverty (but at high cost relative to other strategies). There is a similar picture for the poverty gap.

The situation is quite different when reducing the tax threshold. This has an effect on increasing poverty. The extra tax paid increases the numbers below the poverty threshold and the size of the poverty gap, with the gradient being noticeably steeper in Estonia than in the other four countries. Reducing the tax-free income allowance by 90% would increase the poverty headcount by 8pp. This near-abolition scenario would increase the poverty rate in the remaining countries by between 2pp (Greece) and 4pp (Italy and UK).

4.4 Minimum wage

Table 2 shows that increasing the minimum wage by a small amount (5%) has almost no effect on the poverty headcount. The largest effect of increasing it by 20% is in Greece and is then only a 0.5pp reduction. Increasing by 90%, or almost doubling, does start to make a difference: lowering poverty headcounts by 4pp in Greece and Hungary, 3pp in Bulgaria and by at least 1pp in the other three countries. Indicated by the gradients shown in Figures 4a and 4b (shown only for increases in minimum wage level, as explained above) poverty reduction effectiveness is higher in Bulgaria, Estonia and Hungary than Belgium and the UK, with Greece in an intermediate position.

The scale of change to the minimum wage level that would be needed to make a substantial difference to poverty – which would approach the level of the median wage in some countries – is such that would cause major disruption to the labour market. The increase in employer costs implied by the policy even without this disruption, as indicated in Figures 4a and 4b, as a percentage of GDP is over 5% in Greece, over 4% in Belgium, Hungary and the UK and between 1% and 2% in Bulgaria and Estonia. The rather minor effect on poverty given this scale of resource is due to the fact that many minimum wage earners or people with earnings a little above that level are not in households with income below the poverty threshold.

4.5 Whole system

In order to provide a benchmark for the individual policy instruments that we consider, Figure 5a and 5b show the poverty cost-effectiveness of contracting/expanding the whole system by between -20% and +20%. It is notable that neither the budgetary cost of expansion nor the budgetary gain from contraction are the same size in GDP terms across countries, reflecting both differences in overall size of the systems and in the importance of monetary levels and thresholds in the systems. The cost effects are largest in Belgium and Italy (due at least in part to their large pension systems) and smallest in Estonia. The poverty cost-effectiveness also differs across countries with the largest poverty effects (in terms of both headcount and gap) per budgetary unit in Estonia and the UK and the smallest in Greece.

4.6 Comparisons across policy instruments

A comparison of the poverty effectiveness of the particular policy instruments is summarized in Table 4 by showing the poverty-cost ratios (gradients) evaluated for the -/+20% scenarios for three of the

instruments as well as the benchmark case of the whole system.[12] For increases in the instruments, the higher the ratio the greater the poverty reduction for a given increase in spending (i.e. cost-effectiveness). For reductions in the instruments, the higher the ratio the larger the poverty increase for a given budgetary gain.

Comparing within columns and between countries shows that increasing child benefits is most effective at reducing the headcount in Hungary and the UK and the gap in Hungary and Greece (numbers highlighted in bold). Reducing child benefits increases the headcount most for a given budgetary saving in the UK and Greece and to the gap again in Hungary and Greece. Social assistance increases are most cost-effective for the headcount in Belgium and reductions cause the highest poverty increase for a given budgetary saving in the UK. In Estonia changes in either direction have no effect on the headcount but are the most cost-effective at reducing the poverty gap. Changing income tax thresholds has the largest effects given costs in Estonia, for both the headcount and the gap. Inflating the whole system is most cost-effective in Estonia and the UK (for the headcount) and Bulgaria (for the gap). The reverse also applies: reducing all monetary levels has the most poverty-increasing effect given the budgetary gain in the same countries.

Comparing within countries (i.e. across rows in Table 4) and focusing first on the poverty headcount, increasing social assistance is the most cost-effective option of the four considered only in Belgium and the UK (numbers underlined), and there are other policy instrument reductions that have a more damaging effect on poverty in all countries. This is perhaps surprising, given its targeted nature. Child benefits perform better in Bulgaria and Hungary and in these two countries and in the UK these are the most damaging to reduce of the instruments considered. The same applies to child benefits in the two countries without social assistance, Greece and Italy. In Bulgaria and the UK this may be related to the partial income targeting of child benefits. In contrast, social assistance is the best performing instrument in poverty gap reduction effectiveness, as well as being the most damaging to reduce, in all countries with such an instrument with the exception of Hungary where social assistance is small. In Estonia the highest poverty headcount increase from a reduction in policy instrument arises with the income tax threshold and the most cost-effective change to reduce the poverty headcount is not any of the individual instruments but instead whole system expansion.

[12] In the case of the minimum wage the “cost” is measured differently and comparisons cannot be made.

TABLE 4: POVERTY-COST RATIO BY POLICY INSTRUMENT

	Child benefit		Social Assistance		Income tax threshold		Whole tax-benefit system	
	Poverty headcount							
	-20%	*+20%*	*-20%*	*+20%*	*-20%*	*+20%*	*-20%*	*+20%*
Belgium	3.16	3.33	3.02	**7.57**	1.07	0.49	1.97	1.06
Bulgaria	5.38	3.25	3.78	1.65			1.89	1.32
Estonia	3.41	1.92	0.00	0.00	**4.05**	0.99	**3.17**	**2.44**
Greece	**6.63**	4.18			0.39	0.42	1.19	1.01
Hungary	4.28	**4.52**	1.33	2.51			1.85	1.32
Italy	5.49	2.12			1.45	**1.21**	1.50	0.94
UK	**6.28**	**4.24**	**5.28**	5.24	0.67	0.37	**2.97**	**1.87**
	Poverty gap							
	-20%	*+20%*	*-20%*	*+20%*	*-20%*	*+20%*	*-20%*	*+20%*
Belgium	0.98	0.83	2.80	2.11	0.11	0.06	0.51	0.25
Bulgaria	1.71	1.66	2.83	2.66			**0.82**	**0.56**
Estonia	1.03	0.98	**5.29**	**5.32**	**0.51**	**0.26**	**1.11**	**0.59**
Greece	**1.83**	**1.70**			0.19	0.13	0.39	0.16
Hungary	**2.01**	**1.70**	1.36	1.29			0.58	0.33
Italy	1.78	1.62			0.31	0.24	0.42	0.22
UK	1.34	0.87	1.89	1.50	0.12	0.08	0.76	0.39

Source: Authors' calculations using EUROMOD and EU-SILC.

*Notes: The poverty-cost indicator is calculated as the ratio of the change in poverty headcount or gap (using a fixed poverty threshold) to the change in public budget measured as a % of GDP, using the -20% and the +20% change in policy for child benefit, social assistance, income tax and whole system indexation (the gradient of the curves in Figures 1, 2, 3 and 5). The countries with the highest poverty-cost ratio for each scenario for a particular policy instrument (i.e. within columns) are indicated in **bold** (two countries for the policy instruments applying in all 7 cases, one country for the other instruments). The most cost-effective policy instrument within countries for each scenario is shown underlined.*

5 Conclusions

Our analysis provides evidence on the relative effectiveness of different types of policy instrument in reducing the risk of poverty, or limiting its increase, by measuring the implications of increasing or reducing the size of the instrument within its national context.

The assessment of the most cost-effective instrument depends on whether the poverty headcount or poverty gap is used as the outcome indicator and on the direction and scale of the change in some instruments and countries and not others. Nevertheless, our results show that the most preferred options in terms of poverty reduction cost-effectiveness are child benefits and social assistance. Based on the poverty headcount increasing social assistance is the most cost-effective approach of those considered in Belgium and the UK. Child benefit increases are the most effective option

considered in Bulgaria, Greece, Hungary and Italy. In Estonia the benchmark case of indexing all monetary components is actually more cost-effective than any of the single options.

It is important to look at the poverty gap as well as the poverty headcount in evaluating cost-effectiveness. The effect of social assistance in Estonia provides a good illustration. As the 2013 level of social assistance is very low relative to the poverty threshold, its increase makes no difference to the headcount unless it is scaled up to be almost double its current value but scores very highly in terms of cost-effectiveness when the effect on the poverty gap is measured.

While it seems clear that increases in minimum wages are not well targeted on people in households with income below the poverty threshold and are therefore not a suitable policy approach to achieving poverty reduction on their own, they play a role as a building block in underpinning other reforms. They reduce the need for in-work benefits and help to make work pay (Immervoll and Pearson, 2009).[13] This has two positive consequences. First, if increasing social assistance levels seems to be an effective measure to reduce poverty, but for the negative effects on incentives to work (Immervoll, 2010; Collado et al., 2016), then increasing minimum wages as part of a combined package would help to mitigate that adverse effect. Second, minimum wage increases reduce the burden on the public budget not only through improving work incentives but also more directly, by increasing the revenue from personal income taxes and SIC and reducing entitlements to in-work benefits. Based on our simulations, the average effective tax rate across beneficiaries on household income due to increases in minimum wages ranges from 0.50 in Belgium to 0.15 in Bulgaria.[14] In principle this additional revenue could be used to finance some increases in the other components of the poverty-reduction policy package.[15]

The effects are not always linear nor are they always symmetrical for increases and decreases in the instruments. For example, increasing income tax thresholds has little effect on poverty but lowering them would have a larger negative effect. Nevertheless, except in Estonia, this negative effect is smaller for a given budgetary gain than would occur if any of the other instruments were reduced in size. This suggests that a revenue-neutral combination of reduction to the tax threshold and increase in child benefit could be effective. Reducing child benefits is a particularly damaging way to make budgetary cuts, given the implications for the increase in the poverty headcount, especially in Greece and the UK.

The limitations of our approach relate to the sensitivity of conclusions to the starting point. First, in countries without one of the policy instruments as part of its system, the relative effectiveness of the remaining instruments is enhanced. For example, if Greece had a minimum income social assistance scheme in place then its child benefits might look less effective than they do in its absence. Secondly, the instruments analysed were chosen partly because they exist in many of the seven countries. There are other less common instruments that are relevant in particular national contexts, such as in-work benefits, tax credits and housing benefits. As the Estonian case suggests, the most cost-effective poverty-reducing instrument may not be one of those analysed here. However, these caveats are possible to take into account when interpreting the results. We have demonstrated how,

[13] Atkinson (2015) discusses the other potential positive effects of increased wages in general and increased minimum wage levels in terms of higher productivity, decreased shirking, lower probability of leaving etc.

[14] Calculated for the 20% increase in minimum wage and excluding the effects of additional employer SIC. The effective tax rates for the remaining countries are Estonia: 0.23, Greece: 0.19, Hungary: 0.34 and UK: 0.37.

[15] This neglects the possibility that minimum wage recipients are public sector workers.

using microsimulation techniques, we have managed to take account of the national diversity in existing policy systems, population characteristics and economic circumstances at a common point in time to compare the poverty-reducing cost-effectiveness of policies with similar goals across countries.

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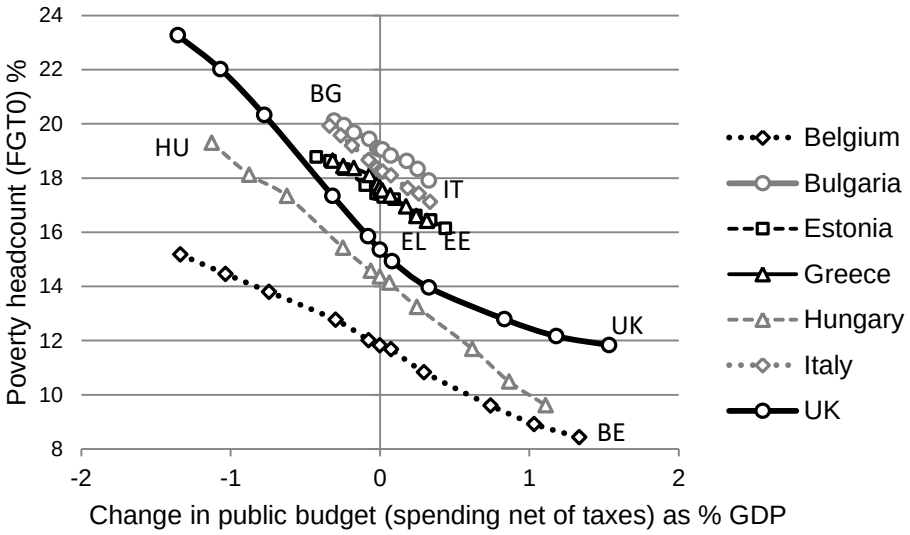
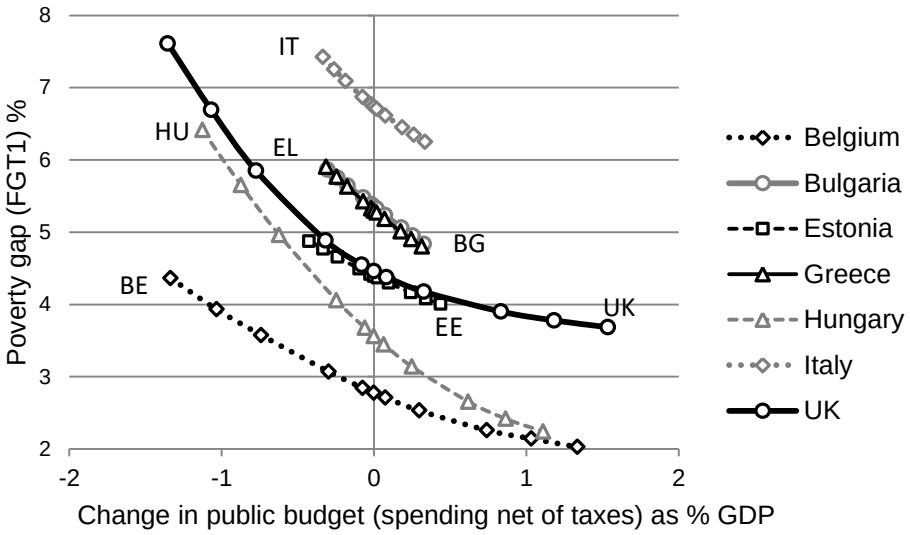
Figure 1: Child benefit levels: poverty effectiveness vs. cost

(a) Poverty headcount (FGT0)



(b) Poverty gap (FGT1)

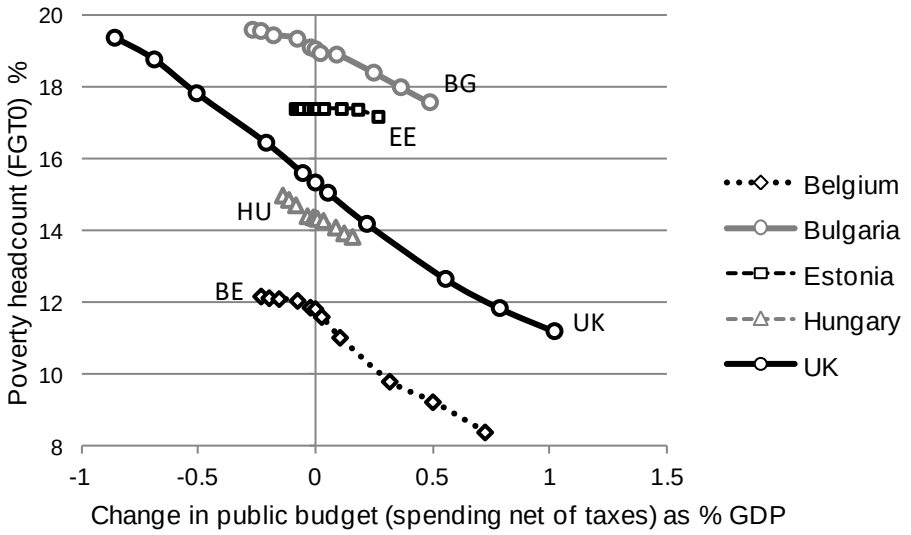


Source: Authors' calculations using EUROMOD and EU-SILC.

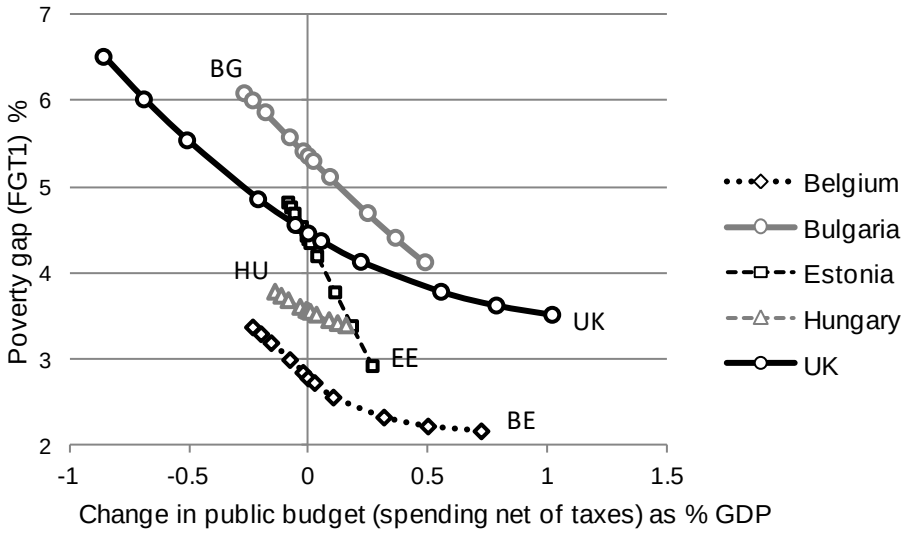
Notes: Reading from left to right, the instruments are decreased by 90%, 70%, 50%, 20% and 5% and increased by 5%, 20%, 50%, 70% and 90%. Poverty is measured using a fixed threshold, 60% of median equivalised household disposable income under the 2013 baseline policy system. The change in the public budget is the direct effect of changing the instruments net of any interactions with the rest of the tax-benefit system, as a percentage of 2013 GDP.

Figure 2: Social assistance minimum income levels: poverty effectiveness vs. cost

(a) Poverty headcount (FGT0)



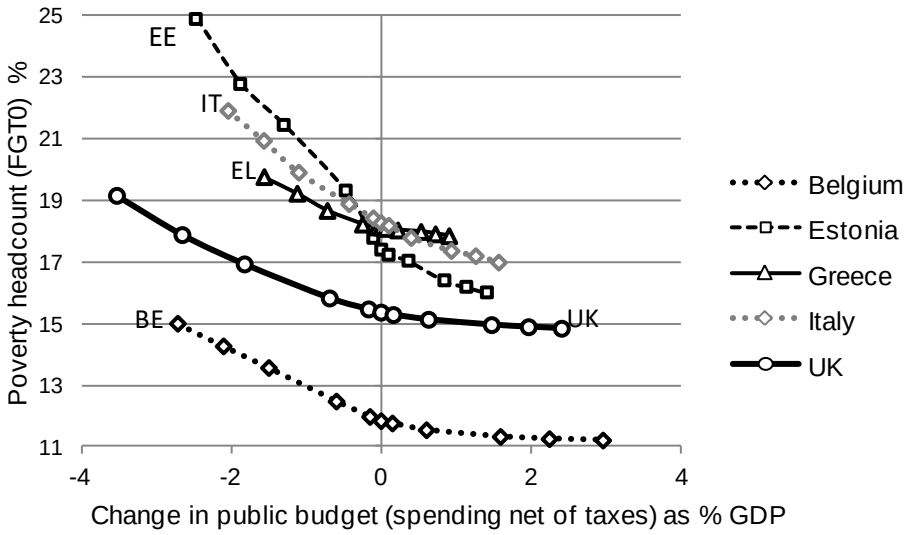
(b) Poverty gap (FGT1)



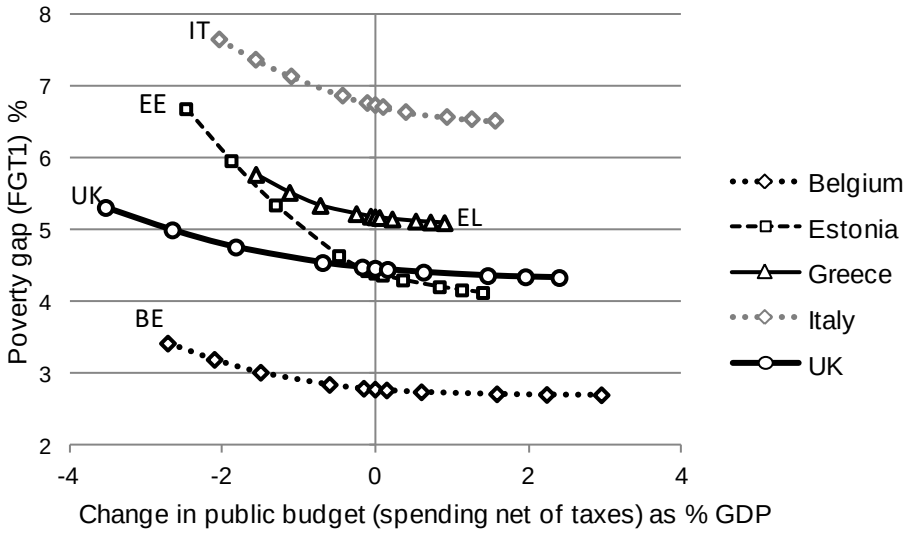
Sources and Notes: see Figure 1. There is no national social assistance benefit in Greece and Italy.

Figure 3: Income tax thresholds: poverty effectiveness vs. cost

(a) Poverty headcount (FGT0)



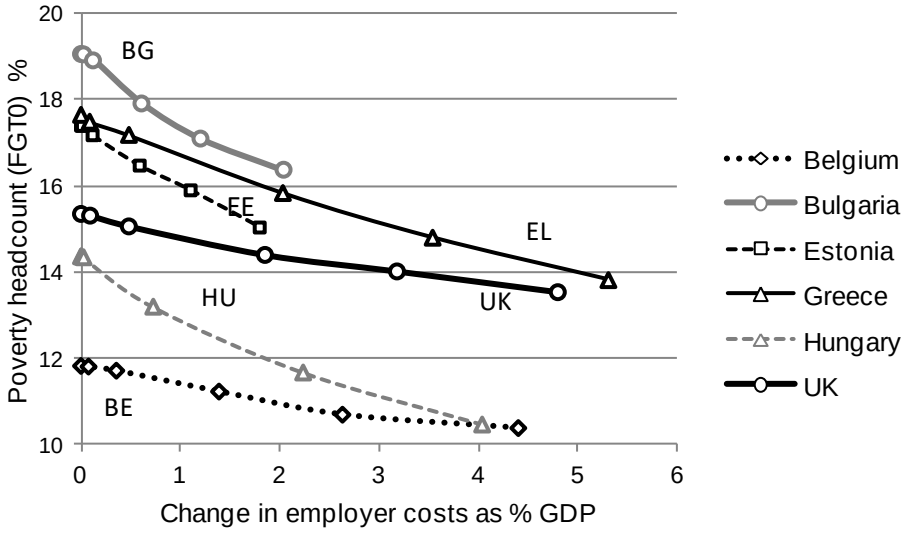
(b) Poverty gap (FGT1)



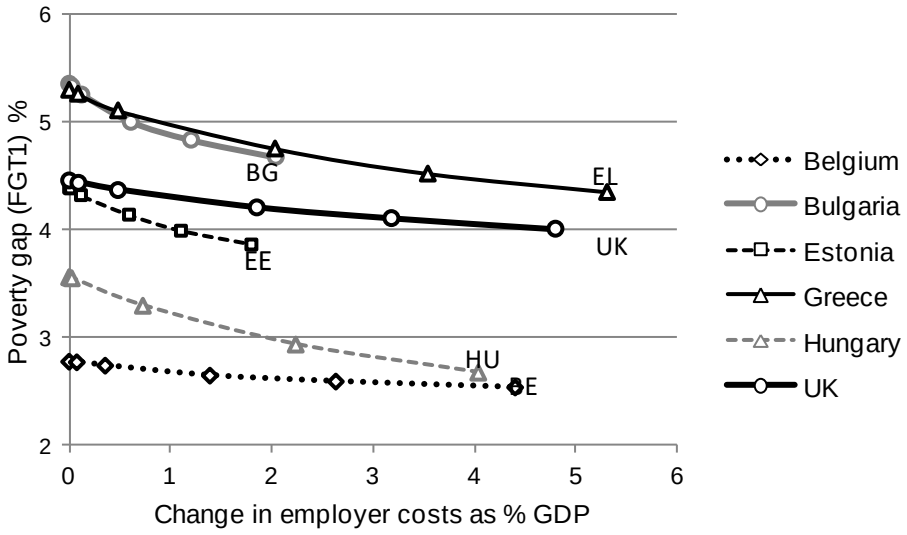
Sources and Notes: see Figure 1. There is no income tax zero rate band in Bulgaria or Hungary.

Figure 4: Minimum wage levels: poverty effectiveness vs. cost

(a) Poverty headcount (FGT0)



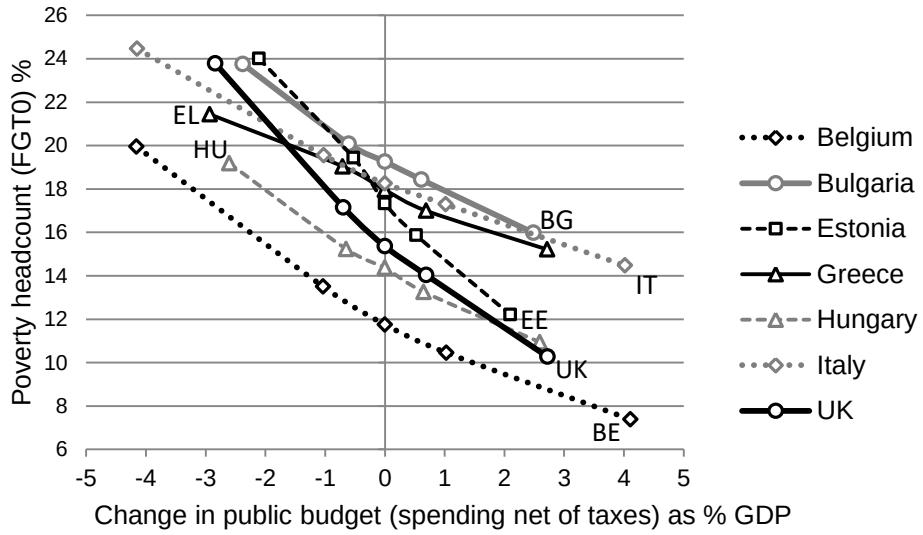
(b) Poverty gap (FGT1)



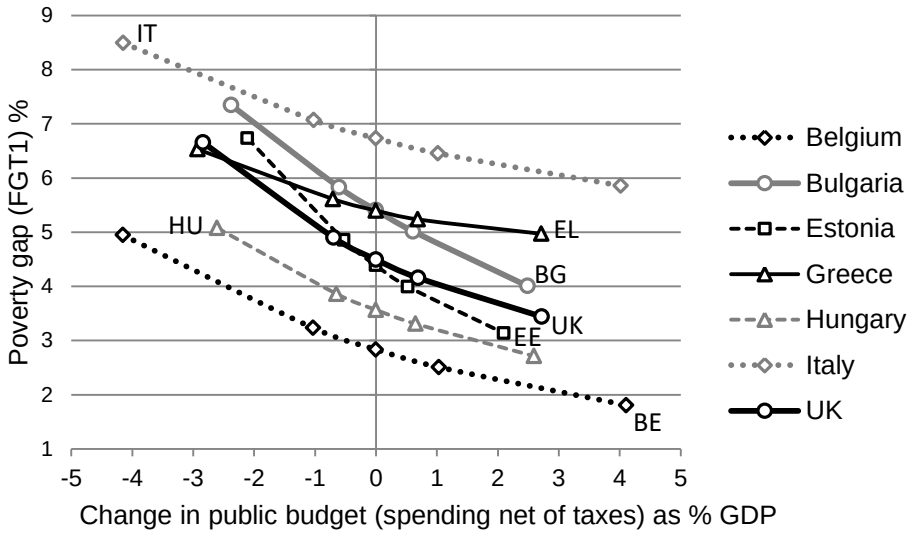
Sources and Notes: see Figure 1. Here the change in cost is measured as the change in employer costs (gross wages plus employer SIC), as a percentage of 2013 GDP. There is no national minimum wage in Italy.

Figure 5: Whole system contraction/expansion: poverty effectiveness vs. cost

(a) Poverty headcount (FGT0)



(b) Poverty gap (FGT1)



Sources and Notes: see Figure 1. Here the system is decreased and increased by 5% and 20%.