Economic Modelling 82 (2019) 211–228

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.journals.elsevier.com/economic-modelling

Individual preferences for public education spending: Does personal income matter?

Debora Di Gioacchino [a], Laura Sabani [b,*], Simone Tedeschi [c]

[a] Sapienza University of Rome, Italy
[b] University of Florence, Italy
[c] University of Roma Tre, Italy

ARTICLE INFO

JEL classification:
H23
H26
H42
H52
I28

Keywords:
Redistribution
Public education expenditure
Individual preferences
Education system

ABSTRACT

Standard redistributive arguments suggest that the impact of household income on preferences for public education spending should be negative, because wealthier families are likely to oppose the redistributive effect of public funding. However, the empirical evidence does not confirm this prediction. This paper addresses this 'puzzle' by focusing on the role of the inclusiveness of the education system and the allocation of public spending between tiers of education in shaping the impact of income on preferences. By using data from the International Social Survey Programme (2006), we show that, when access to higher levels of education is restricted (low inclusiveness) and when the share of public spending on tertiary education is high, the poor are less likely to support public education spending. This result suggests that reforming the education system towards greater inclusiveness might contribute to increase political backing for public investment in education from the relatively poor majority of the population.

1. Introduction

Education systems across the world vary considerably, including among developed countries. These differences include the share of GDP devoted to education, the composition of education expenditures by level of education (primary/secondary vs. tertiary), years of compulsory schooling, and school tracking. Another important aspect of differentiation is financing (e.g. public vs private, and thus the level of tuition fees, subsidies, and financial aid to students).

The strict relationship between the structure of the education system and its capacities of ensuring an inclusive and equitable quality of education to all motivates the research efforts to understand the reasons behind the observed differences in national education systems.

This paper contributes to this research agenda by offering a comprehensive study of the determinants of individual attitudes towards public education spending. Indeed, the education system observed in a country is the outcome of a political process that aggregates individuals' conflicting preferences towards public education. Investigating the underlying micro-mechanisms of macro-phenomena is thus a first step towards the comprehension of the variation of education systems across societies.

This article addresses the following questions: what is the role of personal income in determining preferences? What is the role of the socioeconomic context and of the existing education system's characteristics in shaping the impact of income on individual attitudes?

According to our review of the literature, the few empirical studies that have analysed individual-level education policy preferences in a comparative setting have unanimously shown that the impact of household income on preferences is on average weak or nil.[1] This evidence is at odds with the standard redistributive arguments (Meltzer and Richard, 1981), which suggest a negative impact of income on preferences, because wealthier families are likely to oppose the redistributive effect of public funding.

Our research starts from this 'puzzling' evidence. The point we make is as follows: given the hierarchical nature of education,[2] the ultimate redistributive effect of public spending in education is not necessarily progressive, but its intensity and direction is likely to depend on various individual and country-specific factors.

At the individual level, family social status is a fundamental factor that determines benefits from public spending in education. Empirical

* Corresponding author. Università di Firenze, DISEI, Via delle Pandette 21, 50127, Firenze. Italy.
E-mail address: lsabani@unifi.it (L. Sabani).

[1] See for example, Busemeyer (2012), Busemeyer, and Iversen (2014).

[2] In the literature, 'hierarchical' refers to the different tiers of education, where to access an education level all the levels below must be completed.

https://doi.org/10.1016/j.econmod.2019.01.007
Received 7 September 2018; Received in revised form 27 December 2018; Accepted 15 January 2019
Available online 22 January 2019

evidence has demonstrated that even when education fully relies on public funding, children from families with a lower socioeconomic status have lower enrolment rates at increasing levels of education.[3] The literature has explained such evidence by referring to the role of parental education in the children's human-capital production function[4]: children from high-educated families enjoy a comparative advantage in the learning activity, and this advantage gives them a higher chance of benefitting longer from public spending in education.[5]

Family connections, likely related to the social status of the family, play the same role as parental education, to the extent that they affect children's chances of being allocated into better paying jobs.[6] This phenomenon implies that the earning premium from education will not be the same for all, but will be positively related to family social status. Consequently, individuals from lower social status are more likely to oppose further spending on education and demand more direct forms of redistributive spending (Busemyer, 2012).

At the country level, the characteristics of the education system, such as social inclusiveness and allocation of public spending between basic and higher education, strongly affect the distribution of net benefits from public education spending among social classes.[7] Because children from low social status families are disadvantaged in education systems featuring low inclusiveness, the standard effect of income on preferences towards public spending can be offset or even reversed, the more so the higher the share of public spending allocated to tertiary education.

Other country-level factors, such as income inequality and tax evasion, might affect the redistributive content of public expenditures.[8] In particular, income inequality can exacerbate the progressive redistributive effect of public education expenditures and thus, indirectly, contribute to accentuate the negative effect of income on preferences. By contrast, tax evasion or avoidance might decrease this result. Indeed, if tax compliance is not uniformly distributed among social groups and avoidance increases with income, the tax system will be less redistributive than it would be with truthful reporting. Therefore, tax evasion might increase the support for public education spending from those high-income families, who are more likely to be less compliant.

To investigate the individuals' characteristics and the country-level socioeconomic factors that shape preferences for public education, we use micro-data from the International Social Survey Programme (ISSP, 2006 wave) and add macro-variables from different sources. Our results show that household income is a negative predictor of preferences towards public education spending when unambiguously progressive redistributive expenses are considered (e.g. financial help to low-income students). By contrast, individuals' characteristics and the country-specific context matter in shaping the effect of income on preferences when public education expenses are not targeted to any specific social group. In particular, we show that the effect of income on preferences might be offset or even reversed—relative to the Meltzer–Richard argument—when the inclusiveness of the education system and/or the share of spending on basic education are sufficiently low. Moreover, the standard negative effect of income on preferences is decreased by tax evasion, while it is strengthened by income inequality. We also assess the presence of significant residual variability in the income coefficient, which, for the most part, is due to the individual within-country features rather than to the cross-country level. Unobservable factors such as individual abilities or family connections may well account for it.

The contribution of this paper is relevant for political and theoretical reasons. The political relevance is as follows: given the important involvement of governments in the education sector and the importance of skill acquisition for individual and national welfare, understanding the political economy constraints of public education policy is crucial. In particular, our results suggest that reforms of the education system that increase inclusiveness and/or the share of spending on basic education might increase the political support for public investment in education from a relatively poor majority of the population.[9] Theoretically, our paper contributes to the debate on how the institutional context shapes the micro-level association between personal income and support for education spending. In this respect, our novel contribution is an empirical assessment of the impact/influence of the inclusiveness of the education system, the allocation of public spending between tiers of education, and the role of tax evasion.

The remainder of paper is organised as follows: section 2 introduces the related literature; section 3 presents the testable hypotheses; section 4 contains the data and methodology used in the empirical analysis; section 5 presents the results and robustness checks; and finally, section 6 concludes.

2. Related literature

This paper broadly relates to the theoretical literature on the political economy of education funding (Glomm et al., 2011). Understanding how societies allocate public resources for education is a crucial topic, given the effects on redistribution, social mobility, and the skill profile of the population. The literature from this perspective has aimed to answer several fundamental questions, such as what is the level of funding for public education preferred by the majority and how various dimensions of household heterogeneity (e.g., income, age, ability, tastes) affect the political equilibrium.[10]

The analysis of individual attitudes towards public education spending constitutes the backbone of this theoretical literature. However, only recently has a strong interest developed in empirically studying individual preferences regarding education policies in a comparative setting. The first comparative empirical analysis of attitudes was conducted by Busemeyer et al. (2009), who concentrated on the role of income and age in determining preferences for public spending. They

[3] See De Fraja (2004) and Cunha and Heckman (2007). Moreover, children with highly educated parents are more likely to be educated in academically selective schools than those with less educated parents (Dustmann, 2004). On this point, Brezis and Hellier (2018) argued that the division between elite and standard universities is another factor that contributes in generating permanent social stratification.

[4] Glomm and Ravikumar (1992 and 2003) argue that a sufficiently high elasticity of parental human capital in the learning technology might be responsible for low intergenerational mobility of human capital. In addition, Bowles and Gintis (2002) and Goldthorpe and Jackson (2008) emphasize the impact of family models on the development of children's non-cognitive traits, such as risk aversion, extroversion, the willingness to work in team, and the sense of discipline or leadership.

[5] On this point, Gamlath and Lahir (2018) demonstrated that reducing the importance of inherited human capital in the learning technology could facilitate smooth convergence to the long-run outcome.

[6] On the role of family ties, see also Alesina and Giuliano (2014), Franzini et al. (2013), and Coco and Lagravinese (2014).

[7] Standard features of an inclusive education system should be a high degree of comprehensiveness of programs, a relatively even standard of education, a low percentage of private schools, and few possibilities for schools to select their pupils. By contrast, low inclusiveness features include formal differentiation (students are separated by ability through early tracking) and/or informal differentiation (socioeconomic segregation among schools).

[8] See Borck (2007, 2009).

[9] This result resembles what obtained by Gupta et al. (2018) in another context. They show that, despite India's significant income growth in the recent decades, more inclusive policy decisions, such as promoting primary and secondary education, are needed in order to reduce the consumption distance across social groups and thereby social alienation.

[10] See contributions by Blankenau et al. (2007) and Viane and Zilcha (2013). These studies have emphasised the role of pupils' innate abilities and parental skill profile in shaping preferences over the allocation of public funds between different tiers of education. Di Gioacchino and Sabani (2009) instead studied the role of income and wealth inequality in affecting the allocation of public funds between tertiary and non-tertiary education in a political equilibrium. See also Gradstein et al. (2004) and Zhang (2008) on this point.

analysed the 1996 ISSP data set for 14 OECD countries and demonstrated that an individual's position in the life cycle is a more important predictor of preferences for public education spending than income. Busemeyer (2012) and Busemeyer and Iversen (2014) have added to this analysis by recognising the importance of the interaction between individuals' characteristics and macro-level variables (representing the social, institutional, and economic contexts) in shaping preferences. They analysed survey data for many OECD countries and demonstrated that the impact of household income on preferences is on average weak or nil. However, the interaction of household income with two country-level variables, which are a proxy for socioeconomic and educational inequalities, captured significant cross-national variation in the size and in the direction of the income slope.[11]

This paper adds to Busemeyer (2012) and Busemeyer and Iversen (2014) by elaborating on the determinants of the cross-national heterogeneity of the income effect. While the influence of economic inequality and educational inequality has already been analysed in the literature, our novel contribution is an investigation of the role of the inclusiveness of the education system, the allocation of public spending between basic and tertiary education, the earning premium from education, and tax evasion. Finally, we contribute to the existing literature by testing the hypothesis that the residual heterogeneity of the income slope is due to unobservable individual within-country factors.

We analyse the answers to two questions of the ISSP (2006 wave) survey: the first question asks the respondents whether the Government should spend more on education (in general); the second question asks whether the Government should give financial help to university students from low-income families. Although most of the literature has focused only on the first question, we use also the second question to test whether the Meltzer–Richard argument holds when a clear progressive redistributive issue is at stake. In addition, the simultaneous use of the two questions helps increase the precision of the estimates.[12]

3. The argument and testable hypotheses

We have pointed out that net benefits from public education spending depend on income level and various individual and country-specific factors.

At the individual level, parental education plays an important role on preferences, because educational attainments are positively related to this factor. In addition, unobservable factors, such as individual abilities and family connections, likely affect educational outcomes and human capital returns. In particular, family connections (related to the social status of the individual) increase the chances of being allocated into better paying jobs and thus the returns to education. This argument implies that although the country's average earnings premium for formal education should play a positive role in determining preferences, this role might be weaker for individuals who can benefit less from family connections that is individuals from lower background.

As for the country's education system features, the social inclusiveness of the education system and the allocation of public funds between basic and advanced education are likely to affect the progressive content of public spending, because they influence the distribution of benefits from public spending on education among social classes. Consequently, we expect that the effect of income on preferences should also depend on these features. By contrast, if public expenditures on education were precisely targeted to children from a lower background, the standard negative effect of income on preferences should clearly emerge. Our empirical data allow us to distinguish preferences towards general education expenditures and preferences towards expenses targeted to disadvantaged students; thus, in the next section, we want to verify our arguments by testing the following hypotheses:

1. Highly educated individuals unambiguously prefer higher levels of public spending on education.
2. The country's average earnings premium for higher education is positively related to preferences, and its impact depends positively on the individual's income.
3. The impact of personal income on preferences towards general public education spending is affected by the inclusiveness of the education system and by the share of expenditures on tertiary education. Namely, the lower the inclusiveness of the education system and the higher the share of public spending on tertiary education, the higher the support for public education spending at increasing levels of income.
4. The effect of income on preferences for public spending on education specifically targeted to students from a lower background is negative, in line with the Meltzer–Richard argument.
5. The residual heterogeneity in the income slope is also due to unobservable individual factors (such as individual abilities and family connections).

In addition, we investigate the role of income inequality and tax evasion on preferences as they affect the progressive content of public spending. Income inequality can exacerbate the progressive redistributive effect of education expenditures and thus indirectly contribute to accentuate the negative effect of income on preferences. By contrast, tax evasion might increase the support for public education spending from those high-income families, who are more likely to be less tax compliant. Given these arguments, we add a final testable hypothesis:

6. The standard negative effect of income on preferences is amplified by income inequality but decreased by tax evasion.

4. Data and methodology

We use individual-level data from the ISSP. Specifically, the 2006 wave, the most recent available module focused on the 'Role of Government' that investigates attitudes towards State intervention, Government responsibilities, and Government spending. The 2006 wave contains 43,620 observations across 33 countries with formal democratic institutions. Our dependent variables are derived from the answers to two questions on the survey; both inquire about public education expenditures:

1. $Pref_{TEE}$: '*Should the Government spend money on … education? Remember that if you say 'much more', it might require a tax increase to pay for it*';
2. $Pref_{HELP}$: '*Do you think it should or should not be the government's responsibility to give financial help to university students from low-income families?*'

$Pref_{TEE}$ corresponds to a preference for total (public) education expenditures (*TEE*). $Pref_{HELP}$, instead, isolates preferences towards public expenditures explicitly targeted to disadvantaged students, but is focused on tertiary education. Both original variables are multimodal with a natural ordering. However, to reduce the number of parameters in the presence of little variation among the categories, we collapse them into binomial choices. $Pref_{TEE}$ is equal to 1 if the respondent's answer is 'more' or 'much more' (compared with 0, which collapses the 'same', 'less', and 'much less' modalities). $Pref_{HELP}$ is set to 1 if the answer is 'Definitely should be' (compared with 0 if she answers, 'probably should be/should

[11] Although the literature has focused on education policy preferences in general terms (i.e. 'more or less spending on education'), more detailed analyses were conducted by Busemeyer et al. (2011), Busemeyer and Jensen (2012), and Lergetporer et al. (2017). These studies have focused on preferences towards specific types or tiers of education. Unfortunately, often the data were locally collected and did not allow for comparative studies.

[12] Garritzman (2015) used the second question to analyse individual preferences towards public financial aid (subsidies) to students from families with a low income.

not be', or 'Definitely should not be').[13] The overall sample distributions (i.e. original and collapsed) are shown in Figure A.1 in Appendix A. Although $Pref_{TEE}$ is skewed towards 1 (74% the overall mean), for both variables, there is significant cross-country variability (Table A.2).

Formally, we specify the following two non-linear equations:

$$\begin{aligned} Pref_{ij,TEE} &= \boldsymbol{X}'_{ij1}\boldsymbol{\beta}_1 + \varepsilon_{i1} \\ Pref_{ij,HELP} &= \boldsymbol{X}'_{ij2}\boldsymbol{\beta}_2 + \varepsilon_{i2} \end{aligned} \tag{4.1}$$

where $Pref_{ij,\cdot}$ are dichotomic representations of endogenous continuous latent variables reflecting preference intensity and direction for individual i in country j, $\boldsymbol{X}_{ij1}$ and $\boldsymbol{X}_{ij2}$ are vectors of predictors that may have elements in common. Specifically,

$$\boldsymbol{X}'_{ij}\boldsymbol{\beta}_{\cdot} = \underbrace{y'_{ij,\cdot}\vartheta_{\cdot}}_{micro\ level} + \underbrace{z'_{j,\cdot}\delta_{\cdot}}_{macro\ level} + \underbrace{y'_{ij,\cdot}z_{j,\cdot}\theta_{\cdot}}_{cross\ levels}$$

The random terms $\varepsilon_{i\cdot}$ are assumed to be normally distributed. This assumption requires the estimation of probit models. To sharpen identification and improve on the precision of the estimates, we apply an extension of Zellner (1962) seemingly unrelated regression estimator to binary dependent variables by considering, simultaneously, $Pref_{TEE}$ and $Pref_{HELP}$. The reason for this choice is that if there is significant correlation between the error processes, which is testable, the joint estimates will be more efficient than those derived from single-equation regressions (Greene, 2012). We thus estimate a seemingly unrelated bivariate probit with

$$\begin{bmatrix} \varepsilon_{i1} \\ \varepsilon_{i2} \end{bmatrix} \sim \text{Bivariate Normal}\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \sigma_i^2 \begin{bmatrix} I & \rho I \\ \rho I & I \end{bmatrix} \right)$$

where σ_i^2 is the variance of the error terms, which can be heteroscedastic, and ρ is the correlation coefficient between the errors. To assess whether the two outcomes are correlated, we test the significance of ρ.

To account for possible residual variability in the income effect, in a second specification, we relax the assumption that all individuals within the same country are from a population with the same income slope and add random income slopes at the individual level in both equations. We refer to this set of estimates as model 4.2.

Further statistical inference problems, related to individual-level cross-section data grouped in countries, are addressed by calculating robust standard errors clustered at the macro-regional level.[14]

All estimates are obtained by applying a maximum-likelihood conditional mixed-process estimator, which produces heteroscedasticity-consistent standard errors under the hypothesis of normality.

Due to limited coverage of country-level covariates, the estimation sample includes 24,441 observations spread among 20 countries.[15]

4.1. Explanatory variables

As discussed in section 3, our explanatory variables are the individual characteristics and the country-level features that might affect the redistributive content of public expenditures in education.[16] At the individual level, we consider household income (Income)—measured by a self-placement in a scale from 1 (lowest) to 10 (highest)[17]—and the respondent's level of education achieved (Education) —in a scale from 0 (no qualification) to 5 (university or above). As has been customary in the literature, we also control for political orientation (the dummy variables are Far-left, Left, Right), the degree of interest in politics (Interest), and other sociodemographic variables such as age, parent status, female gender, being in education (Age, Parent, Female, Ineduc, respectively).

At the country level, we consider the share of public education expenditures on tertiary education (TERTSHARE) and the intergenerational persistence of education, used as an indicator of the social inclusiveness of the education system. For this latter variable, we take the ratio between the 'odds of being a student in higher education if parents have high levels of education' and the 'odds of being a student in higher education if parents have low levels of education' (ODDSACC).[18] The higher this variable is the less inclusive and the more stratified the education system.

In addition, we consider the average earnings premium for education (SKILLPRE), which is computed as the ratio between the earnings of 25–64-year-old workers with tertiary education to the earnings of workers with only an upper secondary education. These variables are used to specify baseline estimations of models 4.1 and 4.2, and enter the right hand side both additively and in interaction with household income.[19]

Finally, we control for the level of public education expenditures as a share of GDP (EDUCEXP) in the first equation and for the level of public spending in tertiary education as a share of GDP (TERTEXP) in the second equation.

To better identify the cross-country variability of the income effect on preferences, in an augmented specification of the model, we control—additively and in interaction with household income—for the country disposable income Gini (GINI) as a proxy for economic inequality and for a country-level estimate of tax evasion as a percentage of the GDP (TAXEV).[20]

The small number of units at the country level leads to a difficulty in terms of the identification of the country-level parameters. This issue is well recognised in the literature that has used macro-variables in a micro setting. The only means to manage this problem is to limit the number of control variables at the macro-level and assess for the impact of collinearity among the variables, especially at this level, to avoid excessive variance inflation.[21]

[13] This partition is because, in terms of the explanatory capacity of the model, 'probably should be' individuals are more similar to 'probably should not be' than to 'definitely should be' individuals.

[14] It is well-known that failure to control for within-cluster error correlation can lead to misleadingly small standard errors. Moreover, with few clusters the variance estimator can be biased downward, although there is no clear-cut definition in the literature on how few is 'few': '…depending on the situation 'few' may range from less than 20 to less than 50 clusters […]' (Cameron and Miller, 2015). A full analysis of this issue goes beyond the scope of this study; however, as a precautionary approach, and to limit over-rejections of (true) null hypotheses, we opted for the cluster-robust estimate of the variance matrix in presence of 311 (regional) clusters.

[15] The list of countries considered and the distribution of models' variables across countries is reported in Table A.2. From the original dataset, we have lost observations from Chile, Croatia, Dominican Republic, Israel, Japan, Latvia, Philippines, Russia, South Africa, South Korea, Taiwan, Uruguay and Venezuela.

[16] The list of variables (Table A.1) and summary statistics (Table A.2) are shown in Appendix A.

[17] UK lacks this information; hence, we employ a comparable discretization of the self-reported monetary household income.

[18] This variable, characterised by low variability over time, is from OECD Education at a Glance (2012). This variable refers to the period 2008–2010, sufficiently close to the survey interview period.

[19] In the estimation phase, country-level variables are centered at their across-country mean to clearly interpret interactions and average effects.

[20] In building our proxy for tax evasion (TAXEV), we assume that only the self-employed evade taxes. Accordingly, we set TAXEV equal to zero for all non-self-employed respondents and equal to the country tax evasion (as share of GDP) for the self-employed. This last variable is drawn from Buehn and Scnheider (2016). In assuming that only the self-employed evade taxes, we rely on widespread empirical evidence that tax evasion is consistently higher for self-employment income than for employment income.

[21] Table B.3 in Appendix B reports calculations for the variance inflation factor (VIF), a measure of potential multicollinearity. VIF for each variable and for the overall regression are reported. There is no clear rule about acceptable values. However, if a predictor variable has a VIF in excess of approximately 20, then it may be collinear with another predictor. We adopted this simple rule-of-thumb and thus discarded specifications in which there were variables with VIF greater than 20. Such a criterion has led us, for instance, not to include significant country (or regional)-level dummies coupled with country-level predictors.

Table 1
Seemingly unrelated bivariate probit estimates of preferences.

Variables	Baseline model				Augmented model			
	$Pref_{TEE}$		$Pref_{HELP}$		$Pref_{TEE}$		$Pref_{HELP}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coeff.	ME	Coeff.	ME	Coeff.	ME	Coeff.	ME
Micro level (1)								
Education	0.0287***	0.0093***	−0.0354***	−0.0141***	0.0310***	0.0100***	−0.0335***	−0.0133***
	(0.0087)	(0.0028)	(0.0114)	(0.0045)	(0.0086)	(0.0028)	(0.0110)	(0.0044)
Income	0.0198***	0.0064***	−0.0337***	−0.0134***	0.0110	0.0035	−0.0333***	−0.0133***
	(0.0073)	(0.0024)	(0.0099)	(0.0039)	(0.0076)	(0.0024)	(0.0092)	(0.0037)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Macro level								
EDUCEXP	−0.221***	−0.0718***	–	–	−0.198***	−0.0639***	–	–
	(0.0258)	(0.0085)			(0.0268)	(0.0087)		
SKILLPRE	−0.353*	0.0293	–	–	0.286	0.102***	–	–
	(0.205)	(0.0290)			(0.194)	(0.0278)		
ODDSACC	−0.0828***	−0.0066*	−0.0711**	−0.0138**	−0.113***	−0.0178***	−0.0642**	−0.0139**
	(0.0283)	(0.0035)	(0.0282)	(0.0062)	(0.0294)	(0.0038)	(0.0314)	(0.0067)
TERTSHARE	−0.0781***	−0.0114***	−0.0139	−0.0016	−0.0519***	−0.0076***	−0.0173	−0.0012
	(0.0115)	(0.0016)	(0.0139)	(0.0038)	(0.0102)	(0.0015)	(0.0139)	(0.0039)
TERTEXP	–	–	−0.405***	−0.161***	–	–	−0.415***	−0.165***
			(0.124)	(0.0493)			(0.121)	(0.0481)
GINI	–	–	–	–	0.0499***	0.0099***	−0.0168*	−0.0011
					(0.0102)	(0.0017)	(0.0091)	(0.0027)
TAXEV	–	–	–	–	−0.138	0.0112	0.0861	0.0503***
					(0.109)	(0.0127)	(0.0995)	(0.0120)
Cross levels								
Income#SKILLPRE	0.0818**	–	–	–	0.0052	–	–	–
	(0.0345)				(0.0317)			
Income#ODDSACC	0.0115***	–	0.0067	–	0.0106**	–	0.0054	–
	(0.0042)		(0.0047)		(0.0049)		(0.0056)	
Income#TERTSHARE	0.0079***	–	0.0018	–	0.0052***	–	0.0026	–
	(0.0019)		(0.0017)		(0.0017)		(0.0016)	
Income#GINI	–	–	–		−0.0035**	–	0.0026	–
					(0.0016)		(0.0017)	
Income#TAXEV	–	–	–		0.0319*	–	0.0074	–
					(0.0180)		(0.0176)	
Constant	0.270***	–	0.766***	–	0.303***	–	0.764***	–
	(0.0677)		(0.183)		(0.0642)		(0.181)	
ρ	0.259***				0.263***			
	(0.0136)				(0.0130)			
N. of cases	24,441				24,441			
Clusters	311				311			
Pseudo R^2	0.0205				0.0197			
Log-pseudolikelihood	−29,264				−29,156			

Notes: Seemingly Unrelated Bivariate Probit (SUBP) estimates of model (4.1) on ISSP data (2006). Macro-level variables are taken from The World Bank, World Development Indicators 2006 (GINI, EDUCEXP, TERTEXP), from OECD, Education at a Glance (2012) (ODDSACC, SKILLPRE) and from Buehn and Schneider (2016) (TAXEV). Standard errors, between parentheses, are clustered at the macro-regional level (311 clusters). *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

5. Results

This section presents our main empirical findings and focuses on the hypotheses sketched in section 3. Table 1 shows the estimates of equation (4.1).[22] Odd-numbered columns report estimated coefficients, and even-numbered columns show related marginal effects (MEs).

A comparison between the baseline estimates (columns 1–4) with the augmented equations *(i.e.* those controlling for economic inequality and our proxy of tax evasion, columns 5–8) shows that micro-level estimated parameters are nearly identical. Instead, some differences emerge in the coefficients of the country variables and of the interaction terms.

In particular, in the first equation ($Pref_{TEE}$), the interactions of household income with the intergenerational persistency in education (Income*ODDSACC) and with the tertiary share of public spending (Income*TERTSHARE) have the expected sign in both versions of the model and are both statistically significant at the 5% level in the augmented version. Moreover, the interactions of household income with income inequality (Income*GINI) and with our proxy of tax evasion (Income*TAXEV) have the expected sign and are statistically significant. Because we assert that controlling for income inequality and tax evasion allows for a better identification of the income effect on preferences, hereafter we comment on the estimates from the augmented model.

The estimated coefficient of the variable Education confirms our first testable hypothesis (section 3): highly educated individuals prefer higher levels of public spending on education. The result is clear but limited in size. To provide a concrete measure of its marginal effect, the average predicted probability of preferring an increase in public education spending ($Pref_{TEE}$) is 72.5% at the lower secondary level (Education = 2)

[22] Note that the estimated residual correlation between the two error processes is positive (around 0.26) and highly statistically significant. This correlation is slightly higher than the overall correlation between $Pref_{TEE}$ and $Pref_{HELP}$ (0.18).

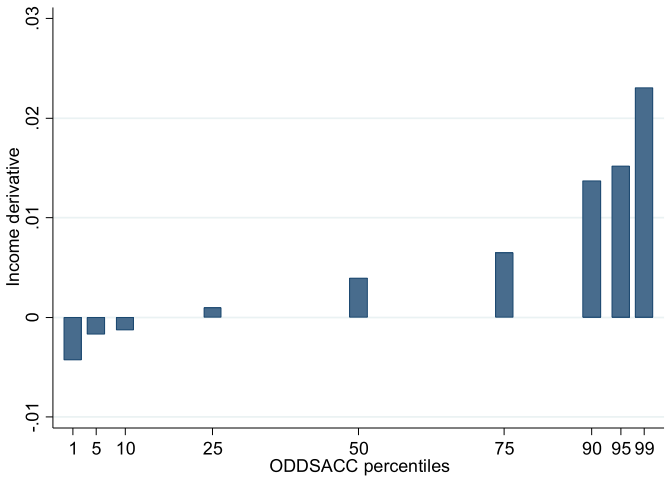

Fig. 1. Derivatives of the income coefficient against ODDSACC percentiles.

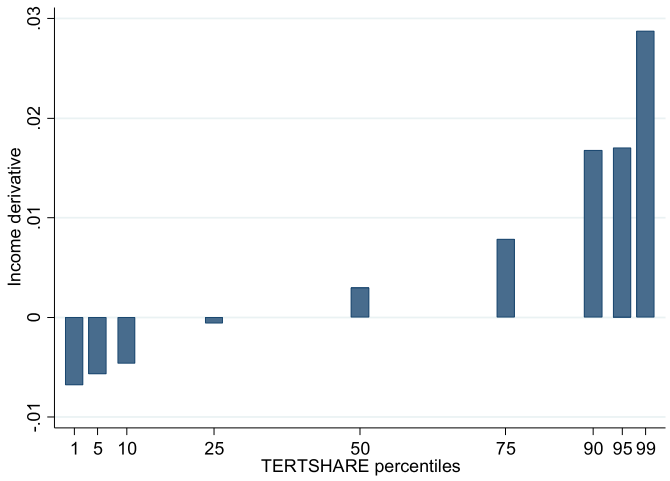

Fig. 2. Derivatives of the income coefficient against TERTSHARE percentiles.

and approximately 75% at the highest educational level (Education = 5).[23]

As for the second testable hypothesis, the estimated coefficient of the average earnings premium for education (SKILLPRE) is positive, as expected, and its interaction with income (Income*SKILLPRE) is positive although statistically not significant.

The effect of household income (Income) on preferences for education expenditures in the first equation of 4.1 ($Pref_{TEE}$) is observed to be nil in size and statistical significance, and this result is in line with the empirical literature. However, positive and statistically significant indirect effects emerge once we consider its interaction with the intergenerational persistency in education (Income*ODDSACC) and with the share of public spending in tertiary education (Income*TERTSHARE). This result confirms our third testable hypothesis: high (low) income individuals are more (less) likely to be in favour of increasing public education spending where the inclusiveness of the education system is low (high ODDSACC) and the share of public spending on tertiary education is high. Moreover, statistically significant indirect effects occur when considering the interactions of household income with income inequality (Income*GINI) and with our proxy of tax evasion (Income*TAXEV). The sign of the coefficients of the interaction terms confirms our sixth testable hypothesis: high (low) income individuals are more (less) likely to be in favour of increasing public education spending where income inequality is low or tax evasion is high.

To provide a measure of the variability in the income marginal effect that can be explained by the country-level dimensions under scrutiny, we calculated income derivatives at specific points of the distribution of the (interacted) macro-variables. The observed variability in the income derivatives suggests that the indirect effect of income on preferences is non-linear. For example, the income derivative of the across-country ODDSACC distribution is 0 at the 1st decile and 0.014 at the 9th decile. Similarly, when comparing the same deciles of the TERTSHARE distribution, the income derivative increases from 0 to a statistically significant 0.017 (Appendix B, Table B.4). For these latter interaction effects, Figs. 1 and 2 below show the variability of the income derivatives from the 1st to the 99th percentiles of the across-country distributions.

To have an idea of the overall across-country income effect variability, we also run separate regressions of the first equation of 4.1 for each of the 20 countries of our estimation sample. The country-specific

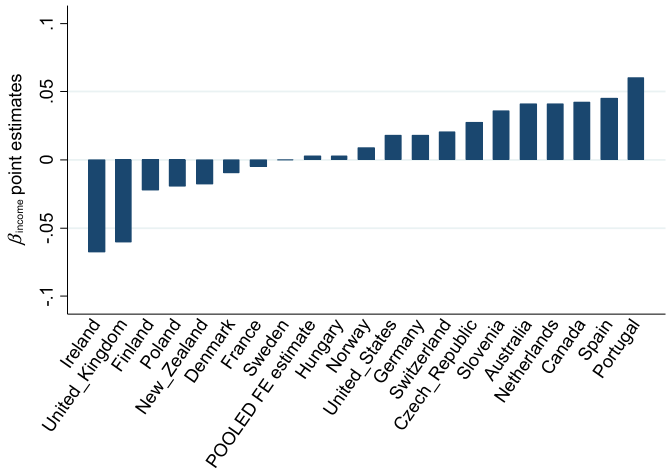

Fig. 3. Income effect by country.

coefficients are shown in Fig. 3 and prove to be quite heterogeneous around their (roughly) 0 average.[24] For example, Portugal, that is in the right tail of the income-coefficient distribution, combines below-the-average inclusiveness (above-the-average ODDSACC) with a high level of tax evasion, and both justify a positive income slope, albeit the high level of income inequality weakens the final impact on the income marginal effect. On the other side of the income slope spectrum, Ireland and the United Kingdom combine above-the-average inclusiveness (below-the-average ODDSACC) and below-the-average tertiary share, and both justify a standard negative income slope. In United Kingdom, this effect is also reinforced by moderate tax evasion and high income inequality.

As for the income effect in the second equation of 4.1 ($Pref_{HELP}$), the negative and significant coefficient and MEs clearly confirm our fourth testable hypothesis (in line with the Meltzer–Richard argument). The effect is also substantial in magnitude. Indeed, the estimated ME implies that the average probability of strongly agreeing to the financial

[23] Results on the predicted probabilities are not shown and are available upon request.

[24] This evidence is confirmed by running a pooled regression that includes interactions between household income and country dummies (not shown).

Table 2
Income effect heterogeneity. Seemingly unrelated bivariate probit estimates of preferences with random income slopes (random coefficients section).

Random effects parameters	Estimate	Std. Err.	[95% Conf.	Interval]
$Pref_{TEE}$ Standard deviations				
Income	**0.072*****	**0.019**	**0.043**	**0.120**
Intercept	0.458**	0.098	0.302	0.698
$Pref_{HELP}$ Standard deviations				
Income	**0.068*****	**0.019**	**0.040**	**0.118**
Intercept	0.374***	0.105	0.217	0.647

help for low-income university students is 41% at the top of the income scale, while it is 53% at the bottom. The income effect in this equation does not show any significant variability across countries, neither across the two educational dimensions (ODDSACC and TERTSHARE) nor with respect to income inequality and tax evasion, as confirmed by the interaction terms being not significant. This evidence confirms that when public spending has a clear progressive redistribution effect, the income impact on preferences is negative in whatever socio-institutional context.

Regarding the role of other micro-level controls, being a woman, a parent, or still in education increases the likelihood to be in favour of an expansion of public education expenditures. In addition, support for education spending increases with the degree of political interest and it is higher for leftist individuals. To measure the last effect, self-placing on the Far-left increases the probability of $Pref_{TEE} = 1$ by 8 percentage points (see Table B.1 in Appendix B).

To account for possible residual variability in the income effect, we estimate model 4.2, consisting of a random income slopes version of model 4.1. Overall, the previous results are confirmed (Table B.2 in Appendix B shows the estimation table integrally reported). The estimated standard deviations (0.072 in the $Pref_{TEE}$ equation and 0.068 in the $Pref_{HELP}$ equation, both statistically significant at the 1% level) lead to a net refusal of the null hypothesis of fixed income slope, after controlling for the country-level interactions (see Table 2 below, which reports the random effects estimates only).[25] This result confirms our fifth testable implication.

The residual income effect variability is, for a negligible part, explained by the interactions with the individual micro-predictors considered so far, leaving a relevant share of the observed country-level variability unexplained.[26] Unobservable factors, such as individual abilities or family connections, may well account for this residual variability.

5.1. Robustness checks

This subsection presents a set of robustness analyses. First, we check for sample selection bias related to the inclusion of country-level variables that do not cover the overall ISSP sample. Table B.5 shows the estimates of equation (4.1)— without country-level predictors—on the overall sample and on the estimation subsample, side by side. It reveals that the subsample closely replicates the correlation structure of the complete sample of countries, for both equations. This evidence should rule out serious concerns of sample selection bias.

Second, a linear estimator is applied to model 4.1 instead of probit. Results are reported in Table B.6. In this case, MEs are not required to interpret the predictors' effects. Estimated coefficients are similar to the probit MEs, although, clearly, not the same.

Finally, only people responding 'much more' to the first question ($Pref_{TEE}$) were explicitly made aware of the likely increased tax burden ('if you say much more it may require an increase in tax'). Thus, we re-estimate the seemingly unrelated bivariate probit model specifying a 'tri-modal' preference—where 'much more' modality is separated by 'more'—and then apply an ordered probit estimator (see Table B.7).[27] The estimates are observed to be robust to this check, the only noticeable difference is the lower significance of Income*ODDSACC.

6. Concluding remarks

Standard redistributive arguments (Meltzer and Richard, 1981) suggest that the impact of household income on preferences for public education spending should be negative because wealthier families are likely to oppose the redistributive effect of public funding. However, the empirical evidence does not confirm this prediction. To provide additional details regarding this topic, we assert that in a hierarchical education system, the ultimate redistributive effect of public spending in education is not necessarily progressive, but the intensity and the direction of the redistribution effect is likely to depend on various individual and country-specific factors.

Our empirical results confirm that household income affects preferences for public education expenditures in a manner that is not as clear as the standard Meltzer and Richard (1981) model would suggest. In particular, the Meltzer–Richard argument is confirmed by the data only when unambiguously progressive redistributive expenses are considered (e.g. financial help to low-income students).

Regarding general public education expenses not targeted to a specific social group, individuals' characteristics and the country-specific context influence the effect of income on preferences. In particular, the data do not reject our theoretical predictions that a sufficiently low inclusiveness of the education system or a sufficiently high share of spending in tertiary education may either offset or reverse the Meltzer–Richard effect of income on preferences. These effects emerge more clearly once we control for two factors that potentially affect the redistributive content of public policies: income inequality and tax evasion. A straightforward policy implication of our results is that reforms of the education system that increase social inclusiveness and/or the share of spending on basic education could raise the support for public investment in education from a relatively poor majority of the population. This, in a majority-voting context, would tend to augment the budget size committed to education.

Acknowledgements

We gratefully thank the editor and two anonymous referees for useful comments that greatly helped us improve our contribution. The usual disclaimers apply. Debora Di Gioacchino acknowledges financial support from Sapienza University of Rome, Italy. Laura Sabani acknowledges financial support from University of Florence, Italy.

[25] The same test conducted on the education coefficients of both equations does not allow a refusal of the null hypothesis of fixed parameter.

[26] The estimated coefficients of the interactions between income and the other individual-level variables, including the interaction between income and education, are not statistically significant at standard levels. These estimates are not shown and are available upon request.

[27] We thank an anonymous referee for suggesting this check.

Appendix A. Data appendix

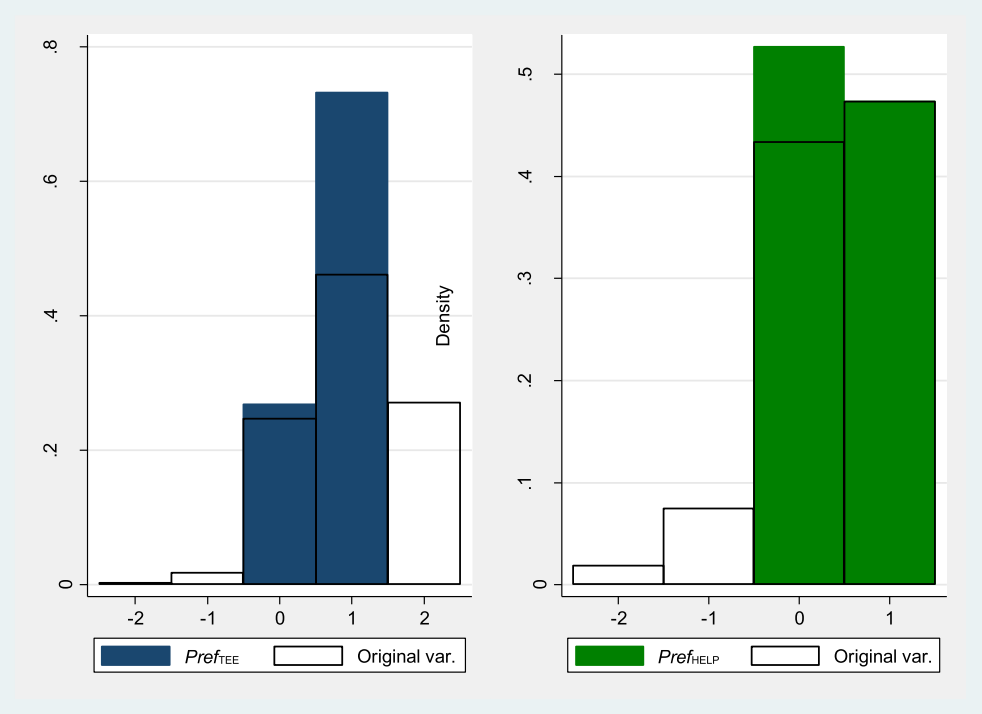

Fig. A.1. $Pref_{TEE}$ and $Pref_{HELP}$ overall distributions (original and estimation configuration).

Table A.2
List of variables.

	Description	Source
Household level		
$Pref_{TEE}$	Preference for variation in the overall level of education spending (binary)	ISSP 2006
$Pref_{HELP}$	Preference for financial help to university students from low income families (binary)	ISSP 2006
Education	Respondent's level of education achieved in a scale from 0 (no qualification) to 5 (University or above)	ISSP 2006
Income	Respondent's household income self-placement in a scale from 1 (lowest) to 10 (highest)	ISSP 2006
Ineduc	Respondent is still in education (dummy)	ISSP 2006
Age	Respondent's age	ISSP 2006
Parent	Respondent has children (dummy)	ISSP 2006
Female	Respondent's gender (dummy)	ISSP 2006
Interest	Respondent's degree of interest in politics (0, 1, …,4)	ISSP 2006
Far-left	Respondent's self-placement in the political spectrum (dummy)	ISSP 2006
Left	""	ISSP 2006
Right	""	ISSP 2006
Country level		
SKILLPRE	Relative earnings from employment among 25-64-year-olds, tertiaty wrt upper secondary	The World Bank, World Development Indicators (2006)
EDUCEXP (%)	Household's country share of public education spending on GDP. Total	The World Bank, World Development Indicators (2006)
TERTEXP (%)	Household's country share of public education spending on GDP. Tertiary	The World Bank, World Development Indicators (2006)
TERTSHARE (%)	TERTEXP/EDUCEXP*100	The World Bank, World Development Indicators (2006)
GINI (%)	Household's country disposable income Gini	The World Bank, World Development Indicators (2006)
ODDSACC	Country-level ratio of "odds of being a student in higher education if parents have high levels of education" to "odds of being a student in higher education if parents have low levels of education"	OECD, Education at a Glance (2012)
TAXEV (%)	Country-level size of tax evasion (in % of GDP, 2006)	Buehn and Schneider (2016, Table 5)

Table A.3
Descriptive statistics of models' variables. Total and by country.

Country	Mean	sd	Min	Max	Country	Mean	sd	Min	Max
Australia					**New Zealand**				
$Pref_{TEE}$	0.80	0.40	0	1	$Pref_{HELP}$	0.69	0.46	0	1
$Pref_{HELP}$	0.40	0.49	0	1	$Pref_{HELP}$	0.27	0.44	0	1
Education	3.48	1.54	0	5	Education	3.03	1.74	0	5
Income	4.94	1.51	1	10	Income	5.96	1.65	1	10
Ineduc	0.03	0.17	0	1	Ineduc	0.04	0.20	0	1
Age	49.58	16.29	17	97	Age	49.34	17.44	18	92
Parent	0.28	0.45	0	1	Parent	0.28	0.45	0	1
Female	0.51	0.50	0	1	Female	0.51	0.50	0	1
Interest	2.40	1.05	0	4	Interest	2.30	1.03	0	4
Far left	0.00	0.00	0	0	Far left	0.01	0.12	0	1
Left	0.38	0.48	0	1	Left	0.14	0.34	0	1
Right	0.38	0.49	0	1	Right	0.21	0.41	0	1
SKILLPRE	1.35	–	–	–	SKILLPRE	1.23	–	–	–
EDUCEXP (%)	4.74	–	–	–	EDUCEXP (%)	5.93	–	–	–
TERTEXP (%)	1.04	–	–	–	TERTEXP (%)	1.47	–	–	–
TERTSHARE (%)	22.00	–	–	–	TERTSHARE (%)	24.77	–	–	–
GINI (%)	34.00	–	–	–	GINI (%)	44.20	–	–	–
ODDSACC	3.95	–	–	–	ODDSACC	9.37	–	–	–
TAXEV (%)	1.00	–	–	–	TAXEV (%)	1.70	–	–	–
N	2,247				N	1,043			
Canada					**Norway**				
$Pref_{TEE}$	0.66	0.48	0	1	$Pref_{TEE}$	0.63	0.48	0	1
$Pref_{HELP}$	0.41	0.49	0	1	$Pref_{HELP}$	0.37	0.48	0	1
Education	3.80	1.15	0	5	Education	3.43	1.30	1	5
Income	5.98	1.74	1	10	Income	6.26	1.55	1	10
Ineduc	0.01	0.12	0	1	Ineduc	0.08	0.27	0	1
Age	51.18	15.44	18	90	Age	46.71	15.47	18	79
Parent	0.27	0.45	0	1	Parent	0.31	0.46	0	1
Female	0.48	0.50	0	1	Female	0.52	0.50	0	1
Interest	2.28	1.11	0	4	Interest	2.41	0.88	0	4
Far left	0.00	0.00	0	0	Far left	0.01	0.12	0	1
Left	0.16	0.37	0	1	Left	0.25	0.44	0	1
Right	0.32	0.47	0	1	Right	0.37	0.48	0	1
SKILLPRE	1.38	–	–	–	SKILLPRE	1.28	–	–	–
EDUCEXP (%)	4.79	–	–	–	EDUCEXP (%)	6.38	–	–	–
TERTEXP (%)	1.76	–	–	–	TERTEXP (%)	2.01	–	–	–
TERTSHARE (%)	36.73	–	–	–	TERTSHARE (%)	31.57	–	–	–
GINI (%)	33.90	–	–	–	GINI (%)	28.10	–	–	–
ODDSACC	7.27	–	–	–	ODDSACC	3.52	–	–	–
TAXEV (%)	1.80	–	–	–	TAXEV (%)	2.40	–	–	–
N	743				N	1,225			
Czech_Republic					**Poland**				
$Pref_{TEE}$	0.66	0.47	0	1	$Pref_{TEE}$	0.80	0.40	0	1
$Pref_{HELP}$	0.40	0.49	0	1	$Pref_{HELP}$	0.59	0.49	0	1
Education	2.63	1.10	1	5	Education	2.68	1.29	0	5
Income	4.50	1.59	1	10	Income	5.06	1.80	1	10
Ineduc	0.06	0.23	0	1	Ineduc	0.07	0.26	0	1
Age	49.50	17.27	18	94	Age	47.50	17.75	18	88
Parent	0.21	0.41	0	1	Parent	0.25	0.43	0	1
Female	0.58	0.49	0	1	Female	0.51	0.50	0	1
Interest	1.90	1.15	0	4	Interest	1.67	0.98	0	4
Far left	0.08	0.27	0	1	Far left	0.06	0.24	0	1
Left	0.14	0.35	0	1	Left	0.05	0.21	0	1
Right	0.27	0.44	0	1	Right	0.01	0.12	0	1
SKILLPRE	1.82	–	–	–	SKILLPRE	1.69	–	–	–
EDUCEXP (%)	4.22	–	–	–	EDUCEXP (%)	5.22	–	–	–
TERTEXP (%)	1.13	–	–	–	TERTEXP (%)	0.96	–	–	–
TERTSHARE (%)	26.72	–	–	–	TERTSHARE (%)	18.33	–	–	–
GINI (%)	26.70	–	–	–	GINI (%)	34.70	–	–	–
ODDSACC	7.66	–	–	–	ODDSACC	4.54	–	–	–
TAXEV (%)	2.80	–	–	–	TAXEV (%)	4.20	–	–	–
N	1,081				N	1,218			
Denmark					**Portugal**				
$Pref_{TEE}$	0.62	0.49	0	1	$Pref_{TEE}$	0.86	0.35	0	1
$Pref_{HELP}$	0.41	0.49	0	1	$Pref_{HELP}$	0.62	0.49	0	1
Education	3.56	1.03	1	5	Education	1.65	1.44	0	5
Income	6.18	1.60	1	10	Income	4.25	1.53	1	10
Ineduc	0.06	0.25	0	1	Ineduc	0.04	0.20	0	1
Age	49.85	15.98	18	90	Age	47.96	18.09	18	90
Parent	0.26	0.44	0	1	Parent	0.26	0.44	0	1

(*continued on next column*)

Table A.3 (*continued*)

Country	Mean	sd	Min	Max	Country	Mean	sd	Min	Max
Australia					**New Zealand**				
Female	0.52	0.50	0	1	Female	0.59	0.49	0	1
Interest	2.45	0.94	0	4	Interest	1.23	1.07	0	4
Far left	0.17	0.37	0	1	Far left	0.07	0.26	0	1
Left	0.22	0.41	0	1	Left	0.25	0.43	0	1
Right	0.31	0.46	0	1	Right	0.01	0.12	0	1
SKILLPRE	1.29	–	–	–	SKILLPRE	1.69	–	–	–
EDUCEXP (%)	7.72	–	–	–	EDUCEXP (%)	4.90	–	–	–
TERTEXP (%)	2.19	–	–	–	TERTEXP (%)	0.93	–	–	–
TERTSHARE (%)	28.41	–	–	–	TERTSHARE (%)	19.07	–	–	–
GINI (%)	27.10	–	–	–	GINI (%)	38.10	–	–	–
ODDSACC	2.12	–	–	–	ODDSACC	5.01	–	–	–
TAXEV (%)	2.20	–	–	–	TAXEV (%)	4.20	–	–	–
N	1,192				N	1,482			
Finland					**Slovenia**				
$Pref_{TEE}$	0.44	0.50	0	1	$Pref_{TEE}$	0.81	0.40	0	1
$Pref_{HELP}$	0.34	0.47	0	1	$Pref_{HELP}$	0.72	0.45	0	1
Education	2.83	1.51	0	5	Education	2.51	1.36	0	5
Income	5.39	1.97	1	10	Income	5.26	1.62	1	10
Ineduc	0.11	0.32	0	1	Ineduc	0.11	0.32	0	1
Age	46.03	16.06	15	75	Age	46.16	17.66	18	94
Parent	0.21	0.41	0	1	Parent	0.21	0.41	0	1
Female	0.54	0.50	0	1	Female	0.53	0.50	0	1
Interest	1.94	0.95	0	4	Interest	1.54	1.09	0	4
Far left	0.00	0.00	0	0	Far left	0.06	0.25	0	1
Left	0.22	0.42	0	1	Left	0.10	0.29	0	1
Right	0.17	0.38	0	1	Right	0.08	0.27	0	1
SKILLPRE	1.48	–	–	–	SKILLPRE	1.85	–	–	–
EDUCEXP (%)	5.93	–	–	–	EDUCEXP (%)	5.57	–	–	–
TERTEXP (%)	1.88	–	–	–	TERTEXP (%)	1.21	–	–	–
TERTSHARE (%)	31.69	–	–	–	TERTSHARE (%)	21.78	–	–	–
GINI (%)	28.00	–	–	–	GINI (%)	24.50	–	–	–
ODDSACC	3.39	–	–	–	ODDSACC	5.24	–	–	–
TAXEV (%)	2.20	–	–	–	TAXEV (%)	4.10	–	–	–
N	983				N	901			
France					**Spain**				
$Pref_{TEE}$	0.60	0.49	0	1	$Pref_{TEE}$	0.87	0.33	0	1
$Pref_{HELP}$	0.55	0.50	0	1	$Pref_{HELP}$	0.71	0.45	0	1
Education	3.06	1.54	0	5	Education	2.32	1.41	0	5
Income	5.22	1.59	1	10	Income	4.94	1.20	1	10
Ineduc	0.03	0.17	0	1	Ineduc	0.04	0.19	0	1
Age	49.66	15.81	18	92	Age	46.30	17.31	18	97
Parent	0.32	0.47	0	1	Parent	0.28	0.45	0	1
Female	0.47	0.50	0	1	Female	0.51	0.50	0	1
Interest	2.40	1.01	0	4	Interest	1.56	1.24	0	4
Far left	0.05	0.22	0	1	Far left	0.06	0.24	0	1
Left	0.36	0.48	0	1	Left	0.28	0.45	0	1
Right	0.21	0.41	0	1	Right	0.09	0.28	0	1
SKILLPRE	1.47	–	–	–	SKILLPRE	1.40	–	–	–
EDUCEXP (%)	5.44	–	–	–	EDUCEXP (%)	4.16	–	–	–
TERTEXP (%)	1.17	–	–	–	TERTEXP (%)	0.93	–	–	–
TERTSHARE (%)	21.41	–	–	–	TERTSHARE (%)	22.29	–	–	–
GINI (%)	30.80	–	–	–	GINI (%)	32.70	–	–	–
ODDSACC	5.20	–	–	–	ODDSACC	4.46	–	–	–
TAXEV (%)	1.70	–	–	–	TAXEV (%)	2.80	–	–	–
N	1,370				N	2,328			
Germany					**Sweden**				
$Pref_{TEE}$	0.83	0.38	0	1	$Pref_{TEE}$	0.52	0.50	0	1
$Pref_{HELP}$	0.40	0.49	0	1	$Pref_{HELP}$	0.30	0.46	0	1
Education	2.09	1.31	0	5	Education	2.96	1.47	1	5
Income	5.41	1.61	1	10	Income	6.02	1.61	1	10
Ineduc	0.05	0.21	0	1	Ineduc	0.07	0.25	0	1
Age	48.89	17.16	18	94	Age	47.92	15.69	17	79
Parent	0.23	0.42	0	1	Parent	0.29	0.45	0	1
Female	0.51	0.50	0	1	Female	0.54	0.50	0	1
Interest	2.03	1.01	0	4	Interest	2.15	1.04	0	4
Far left	0.07	0.25	0	1	Far left	0.05	0.23	0	1
Left	0.28	0.45	0	1	Left	0.37	0.48	0	1
Right	0.24	0.43	0	1	Right	0.20	0.40	0	1
SKILLPRE	1.67	–	–	–	SKILLPRE	1.25	–	–	–
EDUCEXP (%)	4.27	–	–	–	EDUCEXP (%)	6.41	–	–	–
TERTEXP (%)	1.08	–	–	–	TERTEXP (%)	1.72	–	–	–

(*continued on next column*)

Table A.3 (*continued*)

Country	Mean	sd	Min	Max	Country	Mean	sd	Min	Max
Australia					**New Zealand**				
TERTSHARE (%)	25.24	–	–	–	TERTSHARE (%)	26.80	–	–	–
GINI (%)	32.80	–	–	–	GINI (%)	26.50	–	–	–
ODDSACC	4.04	–	–	–	ODDSACC	2.73	–	–	–
TAXEV (%)	1.90	–	–	–	TAXEV (%)	2.40	–	–	–
N	1,469				N	982			
Hungary					**Switzerland**				
$Pref_{TEE}$	0.74	0.44	0	1	$Pref_{TEE}$	0.71	0.45	0	1
$Pref_{HELP}$	0.39	0.49	0	1	$Pref_{HELP}$	0.28	0.45	0	1
Education	2.36	1.29	0	5	Education	2.52	1.20	0	5
Income	4.31	1.52	1	9	Income	5.65	1.69	1	10
Ineduc	0.05	0.22	0	1	Ineduc	0.02	0.14	0	1
Age	48.60	18.36	18	97	Age	50.04	17.46	18	96
Parent	0.26	0.44	0	1	Parent	0.27	0.45	0	1
Female	0.55	0.50	0	1	Female	0.57	0.50	0	1
Interest	1.63	1.11	0	4	Interest	1.93	1.15	0	4
Far left	0.01	0.07	0	1	Far left	0.01	0.08	0	1
Left	0.32	0.47	0	1	Left	0.20	0.40	0	1
Right	0.29	0.45	0	1	Right	0.30	0.46	0	1
SKILLPRE	2.09	–	–	–	SKILLPRE	1.53	–	–	–
EDUCEXP (%)	5.33	–	–	–	EDUCEXP (%)	4.98	–	–	–
TERTEXP (%)	1.02	–	–	–	TERTEXP (%)	1.32	–	–	–
TERTSHARE (%)	19.15	–	–	–	TERTSHARE (%)	26.60	–	–	–
GINI (%)	30.00	–	–	–	GINI (%)	34.50	–	–	–
ODDSACC	7.27	–	–	–	ODDSACC	4.60	–	–	–
TAXEV (%)	3.70	–	–	–	TAXEV (%)	1.30	–	–	–
N	961				N	936			
Ireland					**United Kingdom**				
$Pref_{TEE}$	0.88	0.32	0	1	$Pref_{TEE}$	0.74	0.44	0	1
$Pref_{HELP}$	0.72	0.45	0	1	$Pref_{HELP}$	0.36	0.48	0	1
Education	2.81	1.38	0	5	Education	2.47	1.77	0	5
Income	5.87	1.26	1	10	Income	5.99	2.58	1	10
Ineduc	0.05	0.21	0	1	Ineduc	0.02	0.15	0	1
Age	46.51	17.22	18	93	Age	47.97	17.17	18	91
Parent	0.31	0.46	0	1	Parent	0.24	0.43	0	1
Female	0.57	0.49	0	1	Female	0.57	0.50	0	1
Interest	1.89	1.20	0	4	Interest	2.07	1.15	0	4
Far left	0.00	0.00	0	0	Far left	0.03	0.17	0	1
Left	0.06	0.24	0	1	Left	0.35	0.48	0	1
Right	0.00	0.00	0	0	Right	0.27	0.45	0	1
SKILLPRE	1.75	–	–	–	SKILLPRE	1.65	–	–	–
EDUCEXP (%)	4.54	–	–	–	EDUCEXP (%)	5.23	–	–	–
TERTEXP (%)	1.09	–	–	–	TERTEXP (%)	1.05	–	–	–
TERTSHARE (%)	23.98	–	–	–	TERTSHARE (%)	20.10	–	–	–
GINI (%)	32.70	–	–	–	GINI (%)	34.80	–	–	–
ODDSACC	2.85	–	–	–	ODDSACC	2.62	–	–	–
TAXEV (%)	2.60	–	–	–	TAXEV (%)	1.80	–	–	–
N	863				N	733			
Netherlands					**United States**				
$Pref_{TEE}$	0.72	0.45	0	1	$Pref_{TEE}$	0.82	0.38	0	1
$Pref_{HELP}$	0.37	0.48	0	1	$Pref_{HELP}$	0.55	0.50	0	1
Education	3.03	1.43	0	5	Education	3.51	1.21	0	5
Income	6.28	1.71	1	10	Income	6.51	1.84	1	10
Ineduc	0.03	0.17	0	1	Ineduc	0.00	0.00	0	0
Age	48.48	15.25	18	92	Age	47.42	16.17	18	89
Parent	0.27	0.44	0	1	Parent	0.25	0.43	0	1
Female	0.44	0.50	0	1	Female	0.53	0.50	0	1
Interest	2.43	0.95	0	4	Interest	2.16	1.28	0	4
Far left	0.17	0.37	0	1	Far left	0.00	0.00	0	0
Left	0.24	0.43	0	1	Left	0.32	0.47	0	1
Right	0.18	0.38	0	1	Right	0.23	0.42	0	1
SKILLPRE	1.59	–	–	–	SKILLPRE	1.76	–	–	–
EDUCEXP (%)	5.09	–	–	–	EDUCEXP (%)	5.38	–	–	–
TERTEXP (%)	1.40	–	–	–	TERTEXP (%)	1.42	–	–	–
TERTSHARE (%)	27.50	–	–	–	TERTSHARE (%)	26.35	–	–	–
GINI (%)	30.80	–	–	–	GINI (%)	40.60	–	–	–
ODDSACC	3.01	–	–	–	ODDSACC	5.42	–	–	–
TAXEV (%)	2.00	–	–	–	TAXEV (%)	0.50	–	–	–
N	850				N	1,408			
Total									
$Pref_{TEE}$	0.74	0.44	0	1					

(*continued on next column*)

Table A.3 (*continued*)

Country	Mean	sd	Min	Max	Country	Mean	sd	Min	Max
Australia					**New Zealand**				
$Pref_{HELP}$	0.47	0.50	0	1					
Education	2.82	1.50	0	5					
Income	5.41	1.76	1	10					
Ineduc	0.05	0.21	0	1					
Age	48.23	16.85	15	97					
Parent	0.26	0.44	0	1					
Female	0.53	0.50	0	1					
Interest	2.01	1.14	0	4					
Far left	0.05	0.21	0	1					
Left	0.25	0.43	0	1					
Right	0.21	0.41	0	1					
SKILLPRE	1.54	–	–	–					
EDUCEXP (%)	5.23	0.87	4.16	7.72					
TERTEXP (%)	1.30	0.38	0.93	2.19					
TERTSHARE (%)	24.51	4.29	18.33	36.73					
GINI (%)	32.58	4.66	24.50	44.20					
ODDSACC	4.67	1.72	2.12	9.37					
TAXEV (%)	2.40	0.97	0.50	4.20					
N	24,441								

Appendix B. Further estimates and robustness checks

Table B.1
Seemingly unrelated bivariate probit estimates of preferences (integral version).

VARIABLES	Baseline model				Augmented model			
	$Pref_{TEE}$		$Pref_{HELP}$		$Pref_{TEE}$		$Pref_{HELP}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coeff.	ME	Coeff.	ME	Coeff.	ME	Coeff.	ME
Micro level (1)								
Education	0.0287***	0.0093***	−0.0354***	−0.0141***	0.0310***	0.0100***	−0.0335***	−0.0133***
	(0.0086)	(0.0028)	(0.0114)	(0.0045)	(0.0086)	(0.0027)	(0.0110)	(0.0044)
Income	0.0198***	0.0064***	−0.0337***	−0.0134***	0.0110	0.00352	−0.0333***	−0.0133***
	(0.0073)	(0.0024)	(0.0099)	(0.0037)	(0.0076)	(0.00246)	(0.0092)	(0.0036)
Ineduc	0.208***	0.0675***	0.222***	0.0881***	0.250***	0.0808***	0.221***	0.0880***
	(0.0550)	(0.0180)	(0.0527)	(0.0209)	(0.0538)	(0.0174)	(0.0502)	(0.0199)
Age	−0.0001	−0.0001	−0.0024***	−0.0009***	3.35e-05	1.08e-05	−0.0024***	−0.0009***
	(0.0007)	(0.0002)	(0.0007)	(0.0003)	(0.0007)	(0.0002)	(0.0007)	(0.0003)
Parent	0.145***	0.0470***	−0.0232	−0.0092	0.152***	0.0491***	−0.0234	−0.0091
	(0.0266)	(0.0086)	(0.0203)	(0.0080)	(0.0265)	(0.0085)	(0.0204)	(0.0081)
Female	0.0957***	0.0311***	0.0793***	0.0316***	0.0958***	0.0310***	0.0787***	0.0313***
	(0.0195)	(0.0063)	(0.0182)	(0.0072)	(0.0198)	(0.0064)	(0.0183)	(0.0072)
Micro level (2): political interest and orientation								
Interest	0.0416***	0.0135***	0.0504***	0.0200***	0.0407***	0.0131***	0.0519***	0.0206***
	(0.0120)	(0.0039)	(0.0094)	(0.0037)	(0.0120)	(0.00389)	(0.0094)	(0.0037)
Far-left	0.292***	0.0949***	0.330***	0.131***	0.318***	0.103***	0.325***	0.129***
	(0.0756)	(0.0244)	(0.0544)	(0.0216)	(0.0760)	(0.0244)	(0.0533)	(0.0211)
Left	0.0850***	0.0276***	0.0113	0.0045	0.0935***	0.0302***	0.0130	0.0051
	(0.0285)	(0.0092)	(0.0289)	(0.0115)	(0.0280)	(0.00905)	(0.0284)	(0.0113)
Right	−0.136***	−0.0441***	−0.384***	−0.153***	−0.122***	−0.0393***	−0.379***	−0.151***
	(0.0321)	(0.0104)	(0.0383)	(0.0152)	(0.0325)	(0.0105)	(0.0376)	(0.0149)
Macro level								
EDUCEXP	−0.221***	−0.0718***	–	–	−0.198***	−0.0639***	–	–
	(0.0258)	(0.0085)			(0.0268)	(0.0087)		
SKILLPRE	−0.353*	0.0293	–	–	0.286	0.102***	–	–
	(0.205)	(0.0290)			(0.194)	(0.0278)		
ODDSACC	−0.0828***	−0.0066*	−0.0711**	−0.0138**	−0.113***	−0.0178***	−0.0642**	−0.0139**
	(0.0283)	(0.0034)	(0.0282)	(0.0062)	(0.0294)	(0.0038)	(0.0314)	(0.0067)
TERTSHARE	−0.0781***	−0.0114***	−0.0139	−0.0017	−0.0519***	−0.0076***	−0.0173	−0.0013
	(0.0115)	(0.0016)	(0.0139)	(0.0038)	(0.0102)	(0.0015)	(0.0139)	(0.0039)
TERTEXP	–	–	−0.405***	−0.161***	–	–	−0.415***	−0.165***
			(0.124)	(0.0493)			(0.121)	(0.0481)
GINI	–	–	–	–	0.0499***	0.0099***	−0.0168*	−0.0011
					(0.0102)	(0.0017)	(0.0091)	(0.0027)
TAXEV	–	–	–	–	−0.138	0.0112	0.0861	0.0503***
					(0.109)	(0.0127)	(0.0995)	(0.0120)
(Continue) Cross levels								
Income#SKILLPRE	0.0818**	–	–	–	0.0052	–	–	–
	(0.0345)				(0.0317)			

(*continued on next column*)

Table B.1 (*continued*)

VARIABLES	Baseline model				Augmented model			
	$Pref_{TEE}$		$Pref_{HELP}$		$Pref_{TEE}$		$Pref_{HELP}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coeff.	ME	Coeff.	ME	Coeff.	ME	Coeff.	ME
Income#ODDSACC	0.0115***	–	0.0067	–	0.0106**	–	0.0054	–
	(0.0041)		(0.0047)		(0.0049)		(0.0056)	
Income#TERTSHARE	0.0079***	–	0.0018	–	0.0052***	–	0.0026	–
	(0.0019)		(0.0017)		(0.0017)		(0.0016)	
Income#GINI	–	–	–		−0.0035**	–	0.0026	–
					(0.0016)		(0.0017)	
Income#TAXEV	–	–	–		0.0319*	–	0.0074	–
					(0.0180)		(0.0176)	
Constant	0.270***	–	0.766***	–	0.303***	–	0.764***	–
	(0.0677)		(0.183)		(0.0642)		(0.181)	
ρ	0.259***				0.263***			
	(0.0136)				(0.0130)			
N. of cases	24,441				24,441			
Clusters	311				311			
Pseudo R^2	0.0205				0.0197			
Log-pseudolikelihood	−29,264				−29,156			

Notes: Seemingly Unrelated Bivariate Probit (SUBP) estimates of model (4.1) on ISSP data (2006). Macro level variables are taken from The World Bank, World Development Indicators 2006 (GINI, EDUCEXP, TERTEXP), from OECD, Education at a Glance (2012) (ODDSACC, SKILLPRE) and from Buehn and Schneider (2016) (TAXEV). Standard errors, between parentheses, are clustered at the macro-regional level (311 clusters). *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

Table B.2
Seemingly unrelated bivariate probit estimates of preferences with random income slopes (integral version).

Variables	Augmented model			
	$Pref_{TEE}$		$Pref_{HELP}$	
	(1)	(2)	(3)	(4)
	Coeff.	ME	Coeff.	ME
Micro level (1)				
Education	0.0270***	0.0087***	−0.0328***	−0.0131***
	(0.0068)	(0.0022)	(0.0063)	(0.0025)
Income	0.00799	0.00261	−0.0325***	−0.0129***
	(0.0059)	(0.0019)	(0.0053)	(0.0021)
Ineduc	0.262***	0.0844***	0.247***	0.0981***
	(0.0479)	(0.0154)	(0.0434)	(0.0173)
Age	−0.0003	−0.0001	−0.0015**	−0.0006**
	(0.0006)	(0.0002)	(0.0006)	(0.0002)
Parent	0.164***	0.0527***	−0.0160	−0.0063
	(0.0224)	(0.0072)	(0.0204)	(0.0081)
Female	0.0897***	0.0289***	0.0784***	0.0312***
	(0.0182)	(0.0058)	(0.0169)	(0.0067)
Micro level (2): political interest and orientation				
Interest	0.0401***	0.0129***	0.0478***	0.0190***
	(0.0088)	(0.0028)	(0.0081)	(0.0032)
Far-left	0.328***	0.106***	0.318***	0.126***
	(0.0474)	(0.0153)	(0.0413)	(0.0164)
Left	0.0922***	0.0297***	0.0155	0.0061
	(0.0229)	(0.0073)	(0.0206)	(0.0081)
Right	−0.153***	−0.0494***	−0.390***	−0.155***
	(0.0234)	(0.0075)	(0.0228)	(0.0090)
Macro level				
EDUCEXP	−0.201***	−0.0647***	–	–
	(0.0121)	(0.0039)		
SKILLPRE	0.175	0.0971***	–	–
	(0.166)	(0.0166)		
ODDSACC	−0.0930***	−0.0177***	−0.0644***	−0.0139***
	(0.0200)	(0.0020)	(0.0169)	(0.0022)
TERTSHARE	−0.0502***	−0.0074***	−0.0111	−0.0015
	(0.0083)	(0.0008)	(0.0071)	(0.0013)
TERTEXP	–	–	−0.422***	−0.168***
			(0.0406)	(0.0161)
GINI	0.0463***	0.0099***	−0.0154**	−0.0017**
	(0.0076)	(0.0007)	(0.0065)	(0.0008)
TAXEV	−0.0239	0.0149	0.161**	0.0446***
	(0.0860)	(0.0093)	(0.0779)	(0.0104)
Cross Level				
Income#SKILLPRE	0.0234	–	–	–

(*continued on next column*)

Table B.2 (*continued*)

Variables	Augmented model			
	$Pref_{TEE}$		$Pref_{HELP}$	
	(1)	(2)	(3)	(4)
	Coeff.	ME	Coeff.	ME
	(0.0285)			
Income#ODDSACC	0.0070**	–	0.0054*	–
	(0.0034)		(0.0030)	
Income#TERTSHARE	0.0050***	–	0.0013	–
	(0.0014)		(0.0011)	
Income#GINI	−0.0028**	–	0.0020*	–
	(0.0013)		(0.0012)	
Income#TAXEV	0.0130	–	−0.0089	–
	(0.0148)		(0.0136)	
Constant	0.362***	–	0.729***	–
	(0.0524)		(0.0661)	
ρ	0.272***			
	(0.0120)			
N. of cases	24,441			
Pseudo R^2	0.0418			
Log-pseudolikelihood	−29,165			
Income effect heterogeneity	Estimate	Std. Err.	[95% Conf.	Interval]
Random effects parameters				
$Pref_{TEE}$ Standard deviations				
Income	**0.072****	**0.019**	**0.043**	**0.120**
Intercept	0.458**	0.098	0.302	0.698
$Pref_{HELP}$ Standard deviations				
Income	**0.068****	**0.019**	**0.040**	**0.118**
Intercept	0.374***	0.105	0.217	0.647

Notes: Seemingly Unrelated Bivariate Probit (SUBP) estimates of model (4.2 - random income slopes) on ISSP data (2006). Macro level variables are taken from The World Bank, World Development Indicators 2006 (GINI, EDUCEXP, TERTEXP), from OECD, Education at a Glance (2012) (ODDSACC, SKILLPRE) and from Buehn and Schneider (2016) (TAXEV). Standard errors, between parentheses. *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

Table B.3
Multicollinearity diagnostics. Variance inflation factor (VIF).

$Pref_{TEE}$ equation		$Pref_{HELP}$ equation	
Variable	VIF 1/VIF	Variable	VIF 1/VIF
Education	5.50 0.1816	Education	5.89 0.1697
Income	9.59 0.1042	Income	11.65 0.0858
Ineduc	1.19 0.8409	Ineduc	1.27 0.7847
Age	6.44 0.1552	Age	9.74 0.1026
Parent	1.46 0.6826	Parent	1.54 0.6499
Female	2.03 0.4918	Female	2.09 0.4784
Interest	5.05 0.1981	Interest	5.09 0.1964
Far-left	1.11 0.8971	Far-left	1.12 0.892905
Left	1.54 0.6487	Left	1.54 0.6489
Right	1.52 0.6579	Right	1.51 0.6601
EDUCEXP	1.37 0.7323	TERTEXP	21.52 0.0464
RELEARN	15.99 0.0625	ODDSACC	11.89 0.0841
ODDSACC	14.70 0.0680	TERTSHARE	12.38 0.0807
TERTSHARE	15.64 0.0639	GINI	13.35 0.0748
GINI	15.10 0.0662	TAXEV	9.46 0.1057
TAXEV	9.43 0.1060	Income#ODSSACC	13.38 0.0747
Income#RELEARN	14.95 0.0668	Income#TERTSHARE	11.99 0.0833
Income#ODDSACC	15.32 0.0652	Income#GINI	15.03 0.0665
Income#TERTSHARE	15.37 0.0650	Income#TAXEV	9.54 0.1048
Income#.GINI	16.13 0.0620		
Income#TAXEV	9.52 0.1050		
Mean VIF	8.52	Mean VIF	8.42

Notes: Post-estimation calculation of variance inflation factors (uncentered) on model (4.1).

Table B.4
Derivatives of the income coefficient calculated at the 1st and the 9th deciles of the interacted country-level variables distribution.

Variable	at 1st decile		at 9th decile	
	dy/dx	P>|z|	dy/dx	P>|z|
ODDSACC	−0.002	0.706	0.014	0.005
TERTSHARE	−0.004	0.286	0.017	0.001
GINI	0.011	0.004	−0.003	0.364
TAXEV	0.004	0.058	0.022	0.029

Notes: post-estimation calculation of model (4.1), $Pref_{TEE}$ equation.

Table B.5
Seemingly unrelated bivariate probit of preferences equations without country-level predictors, full Vs estimation sub-sample.

VARIABLES	$Pref_{TEE}$		$Pref_{HELP}$	
	(1)	(2)	(3)	(4)
	Coeff.	Coeff.	Coeff.	Coeff.
Micro level (1)				
Education	0.0276***	0.0258***	−0.0389***	−0.0470***
	(0.007)	(0.0080)	(0.0077)	(0.0091)
Income	0.0045	0.0082	−0.0374***	−0.0391***
	(0.0070)	(0.0068)	(0.0053)	(0.0074)
Ineduc	0.176***	0.274***	0.174***	0.250***
	(0.0459)	(0.0561)	(0.0354)	(0.0510)
Age	−0.0008	−0.0004	−0.0017***	−0.0019***
	(0.0005)	(0.0007)	(0.0005)	(0.0007)
Parent	0.165***	0.165***	−0.0119	−0.0191
	(0.0201)	(0.0268)	(0.0175)	(0.0206)
Female	0.0899***	0.102***	0.0703***	0.0951***
	(0.0168)	(0.0195)	(0.0145)	(0.0182)
Micro level (2): political interest and orientation				
Interest	0.0486***	0.0549***	0.0489***	0.0778***
	(0.0117)	(0.0126)	(0.0098)	(0.0089)
Far-left	0.226***	0.260***	0.299***	0.350***
	(0.0572)	(0.0670)	(0.0411)	(0.0481)
Left	0.146***	0.121***	0.119***	0.0945***
	(0.0253)	(0.0256)	(0.0228)	(0.0244)
Right	−0.0747***	−0.101***	−0.183***	−0.256***
	(0.0264)	(0.0316)	(0.0279)	(0.0317)
Constant	0.869***	0.619***	0.568***	0.465***
	(0.125)	(0.100)	(0.0744)	(0.0857)
Country dummies	Yes	Yes	Yes	Yes
ρ	0.229***		0.237***	
	(0.0132)		(0.0141)	
N. of cases	43,059	24,441	43,026	24,441
Clusters	423	311	423	311
Pseudo R^2	0.0472	0.263	0.0472	0.263
Log-pseudolikelihood	−47,454	−28,283	−47,454	−28,283

Notes: Seemingly Unrelated Bivariate Probit (SUBP) estimates of model (4.1) on ISSP data (2006) without country-level predictors. Columns (1) and (3) refer to the full ISSP (2006) sample covering 33 countries, columns (2) and (4) refer to the sub-sample of 20 countries. Standard errors, between parentheses, are clustered at the macro-regional level. *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

Table B.6
Linear estimates of preferences equations (SUR).

Variables	Augmented model	
	$Pref_{TEE}$	$Pref_{HELP}$
	(1)	(2)
	Coeff.	Coeff.
Micro level (1)		
Education	0.0094***	−0.0128***
	(0.0027)	(0.0042)
Income	0.0047**	−0.0127***
	(0.0023)	(0.0035)
Ineduc	0.0771***	0.0851***
	(0.0160)	(0.0192)
Age	1.27e-05	−0.0009***

(*continued on next column*)

Table B.6 (*continued*)

Variables	Augmented model	
	$Pref_{TEE}$	$Pref_{HELP}$
	(1)	(2)
	Coeff.	Coeff.
	(0.0002)	(0.0002)
Parent	0.0472***	−0.0087
	(0.0079)	(0.0078)
Female	0.0298***	0.0299***
	(0.0060)	(0.0070)
Micro level (2): political interest and orientation		
Interest	0.0133***	0.0197***
	(0.0037)	(0.0036)
Far-left	0.0941***	0.124***
	(0.0205)	(0.0201)
Left	0.0285***	0.0049
	(0.0082)	(0.0111)
Right	−0.0386***	−0.143***
	(0.0105)	(0.0143)
Macro level		
EDUCEXP	−0.0656***	–
	(0.0085)	
SKILLPRE	0.0782	–
	(0.0601)	
ODDSACC	−0.0342***	−0.0250**
	(0.0098)	(0.0122)
TERTSHARE	−0.0181***	−0.0071
	(0.0032)	(0.0053)
TERTEXP	–	−0.158***
		(0.0460)
GINI	0.0157***	−0.0064*
	(0.0033)	(0.0035)
TAXEV	−0.0410	0.0362
	(0.0320)	(0.0367)
Cross Level		
Income#SKILLPRE	0.0045	–
	(0.0099)	
Income#ODDSACC	0.0034**	0.0021
	(0.0016)	(0.0021)
Income#TERTSHARE	0.0018***	0.0010*
	(0.0005)	(0.0006)
Income#GINI	−0.0011**	0.0009
	(0.0005)	(0.0006)
Income#TAXEV	0.0094*	0.0022
	(0.005)	(0.006)
Constant	0.616***	0.791***
	(0.0206)	(0.0695)
ρ	0.146***	
	(.00704)	
N. of cases	24,441	
Clusters	311	
Pseudo R^2	0.0206	
Log-pseudolikelihood	−30,483	

Notes: Linear Seemingly unrelated regressions (SUR) regressions of equation (4.1) on ISSP data (2006). Macro level variables are taken from The World Bank, World Development Indicators 2006 (GINI, EDUCEXP, TERTEXP), from OECD, Education at a Glance (2012) (ODDSACC, SKILLPRE) and from Buehn and Schneider (2016) (TAXEV). Standard errors, between parentheses, are clustered at the macro-regional level (311 clusters). *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

Table B.7
Seemingly unrelated bivariate ordered probit estimates with 'tri-modal' specification for $Pref_{TEE}$.

Variables	Augmented model	
	$Pref_{TEE}$	$Pref_{HELP}$
	(1)	(2)
	Coeff.	Coeff.
Micro level (1)	0.0321***	−0.0332***
Education	(0.0078)	(0.0110)

(*continued on next column*)

Table B.7 (*continued*)

Variables	Augmented model	
	$Pref_{TEE}$	$Pref_{HELP}$
	(1)	(2)
	Coeff.	Coeff.
Income	0.0133**	−0.0333***
	(0.0066)	(0.0092)
Ineduc	0.213***	0.221***
	(0.0416)	(0.0503)
Age	−0.0002	−0.0024***
	(0.0006)	(0.0007)
Parent	0.126***	−0.0231
	(0.0232)	(0.0204)
Female	0.0720***	0.0783***
	(0.0152)	(0.0183)
Micro level (2): political interest and orientation		
Interest	0.0646***	0.0520***
	(0.0106)	(0.0094)
Far-left	0.282***	0.325***
	(0.0609)	(0.0536)
Left	0.0748***	0.0131
	(0.0229)	(0.0284)
Right	−0.131***	−0.379***
	(0.0319)	(0.0376)
Macro level		
EDUCEXP	−0.176***	–
	(0.0254)	
SKILLPRE	0.289*	–
	(0.167)	
ODDSACC	−0.0911***	−0.0645**
	(0.0247)	(0.0314)
TERTSHARE	−0.0370***	−0.0174
	(0.0084)	(0.0139)
TERTEXP	–	−0.416***
		(0.121)
GINI	0.0467***	−0.0171*
	(0.0087)	(0.0091)
TAXEV	−0.119	0.0856
	(0.0852)	(0.0993)
Cross Level		
Income#SKILLPRE	0.0289	–
	(0.0264)	
Income#ODDSACC	0.0068	0.0054
	(0.0045)	(0.0056)
Income#TERTSHARE	0.0031**	0.0026
	(0.0015)	(0.0016)
Income#GINI	−0.0028*	0.0026
	(0.0014)	(0.0017)
Income#TAXEV	0.0265*	0.0077
	(0.0150)	(0.0176)
ρ	0.308***	
	(.0120)	
N. of cases	24,441	
Clusters	311	
Pseudo R^2	0.0154	
Log-pseudolikelihood	−40,430	

Notes: Seemingly Unrelated Bivariate (ordered) Probit (SUBP) estimates of model (4.1) on ISSP data (2006). The first ($Pref_{TEE}$) equation applies a trinomial ordered probit estimator with 0 = "much less", "less" or "same"; 1 = "more"; 2 = "much more". The second ($Pref_{HELP}$) ρ equation applies a standard probit. Macro level variables are taken from The World Bank, World Development Indicators 2006 (GINI, EDUCEXP, TERTEXP), from OECD, Education at a Glance 2012 (ODDSACC, SKILLPRE) and from Buehn and Schneider, 2016) (TAXEV). Standard errors, between parentheses, are clustered at the macro-regional level (311 clusters). *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

References

Alesina, A., Giuliano, P., 2014. Family ties. In: Handbook of Economic Growth, vol. 2. Elsevier, pp. 177–215. https://doi.org/10.1016/B978-0-444-53538-2.00004-6.

Blankenau, W., Cassou, S., Ingram, B., 2007. Allocating government education expenditures across K-12 and college education. Econ. Theor. 31 (1), 85–112. https://doi.org/10.1007/s00199-006-0084-8.

Borck, R., 2007. Voting inequality and redistribution. J. Econ. Surv. 21, 90–109. https://doi.org/10.1111/j.1467-6419.2007.00265.x.

Borck, R., 2009. Voting on redistribution with tax evasion. Soc. Choice Welfare 32, 439–454. https://doi.org/10.1007/s00355-008-0334-8.

Bowels, S., Gintis, H., 2002. The inheritance of inequality. J. Econ. Perspect. 16 (3), 3–30. https://doi.org/10.1257/089533002760278686.

Brezis, E.S., Hellier, J., 2018. Social mobility at the top and the higher education system. Eur. J. Political Econ. 52, 36–54. https://doi.org/10.1016/j.ejpoleco.2017.04.005.
Buehn, A., Schneider, F., 2016. Size and development of tax evasion in 38 OECD countries: what do we (not) know? Journal of Economics and Political Economy 3 (1), 1–10.
Busemeyer, M.R., 2012. Inequality and the political economy of education: an analysis of individual preferences in OECD countries. J. Eur. Soc. Pol. 22 (3), 219–240. https://doi.org/10.1177/0958928712440200.
Busemeyer, M.R., Cattaneo, M.A., Wolter, S.C., 2011. Individual policy preferences for vocational versus academic education: microlevel evidence for the case of Switzerland. J. Eur. Soc. Pol. 21 (3), 253–273. https://doi.org/10.1177%2F0958928711401769.
Busemeyer, M.R., Goerres, A., Weschle, S., 2009. Attitudes towards redistributive spending in an era of demographic ageing: the rival pressures from age and income in 14 OECD countries. J. Eur. Soc. Pol. 19 (3), 195–212. https://doi.org/10.1177/0958928709104736.
Busemeyer, M.R., Iversen, T., 2014. The politics of opting out: explaining educational financing and popular support for public spending. Soc. Econ. Rev. 12 (2), 299–328. https://doi.org/10.1093/ser/mwu005.
Busemeyer, M.R., Jensen, C., 2012. The impact of economic coordination and educational institutions on individual-level preferences for academic and vocational education. Soc. Econ. Rev. 10 (3), 525–547. https://doi.org/10.1093/ser/mws002.
Cameron, A.C., Miller, D.L., 2015. 'A practitioner's guide to cluster-robust inference'. J. Hum. Resour. 50, 2317–2372. https://doi.org/10.3368/jhr.50.2.317.
Coco, G., Lagravinese, R., 2014. Cronyism and education performance. Econ. Modell. 38, 443–450.
Cunha, F., Heckman, J., 2007. The technology of skill formation. American Economic Review, Papers and Proceedings 97 (2), 31–47. https://doi.org/10.1257/aer.97.2.31.
De Fraja, G., 2004. Education and Redistribution'. *Rivista di Politica Economica*, vols. V-VI, pp. 3–44.
Di Gioacchino, D., Sabani, L., 2009. Education policy and inequality: a political economy approach. Eur. J. Political Econ. 25 (4), 463–478. https://doi.org/10.1016/j.ejpoleco.2009.06.002.
Dustmann, C., 2004. Parental backgrounds, secondary school track choice and wages. Oxf. Econ. Pap. 56 (2), 209–230. https://doi.org/10.1093/oep/gpf048.
Franzini, M., Raitano, M., Vona, F., 2013. The channels of intergenerational transmission of inequality: a cross-country comparison. Riv. Ital. degli Econ. XVIII (2), 201–226. https://doi.org/10.1427/73848.
Gamlath, S., Lahir, R., 2018. Public and private education expenditures, variable elasticity of substitution and economic growth. Econ. Modell. 70, 1–14. https://doi.org/10.1016/j.econmod.2017.10.007.
Garritzman, J., 2015. Attitudes towards student support: how positive feedback-effects prevent change in the Four Worlds of Student Finance. J. Eur. Soc. Pol. 25 (2), 139–158. https://doi.org/10.1177/0958928715573478.
Glomm, G., Ravikumar, B., 1992. Public versus private investment in human capital: endogenous growth and income inequality. J. Polit. Econ. 100 (4), 818–834. https://doi.org/10.1086/261841.
Glomm, G., Ravikumar, B., 2003. Public education and income inequality. Eur. J. Political Econ. 19, 289–300. https://doi.org/10.1016/S0176-2680(02)00178-7.
Glomm, G., Ravikumar, B., Schiopu, I.C., 2011. The political economy of education funding. Handbook of the Economics of Education 4, 615–680. https://doi.org/10.1016/B978-0-444-53444-6.00009-2.
Goldthorpe, J., Jackson, M., 2008. Education-based meritocracy: the barriers to its realisation. Stato Mercato 28 (1), 31–60. https://doi.org/10.1425/26655.
Gradstein, M., Justman, M., Meier, V., 2004. The Political Economy of Education. Implications for Growth and Inequality, first ed., vol. 1. MIT Press. number 0262072564, January.
Greene, W.H., 2012. Econometric Analysis, seventh ed. Prentice Hall, Upper Saddle River, NJ.
Gupta, P., Mallick, S., Mishra, T., 2018. Does social identity matter in individual alienation? Household-level evidence in post-reform India. World Dev. 104, 154–172. https://doi.org/10.1016/j.worlddev.2017.11.007.
Lergetporer, P., Werner, K., Woessmann, L., 2017. Ludger, 'Public Opinion on Education Policy in Germany. CESifo Working Paper Series No. 6602. Available at: SSRN: https://ssrn.com/abstract=3032904.
Meltzer, A., Richard, S., 1981. A rational theory of the size of government. J. Polit. Econ. 89, 914–927. https://doi.org/10.1086/261013.
OECD, 2012. Education at a Glance 2012.
Viane, J.M., Zilcha, I., 2013. Public funding of higher education. J. Publ. Econ. 108, 78–89. https://doi.org/10.1016/j.jpubeco.2013.09.008.
Zhang, L., 2008. Political economy of income distribution. J. Dev. Econ. 87, 119–139. https://doi.org/10.1016/j.jdeveco.2007.11.005.
Zellner, A., 1962. An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. J. Am. Stat. Assoc. 57, 348–368. https://doi.org/10.1080/01621459.1962.10480664.