Institute for New Economic Thinking
AT THE OXFORD MARTIN SCHOOL

Social class and earnings: a cross-national study

Tim Goedemé, Marii Paskov, David Weisstanner and Brian Nolan

17th January 2020

INET Oxford Working Paper No. 2020-03

Employment, Equity & Growth Programme

Social class and earnings: a cross-national study

Tim Goedemé, Marii Paskov, David Weisstanner and Brian Nolan

Institute for New Economic Thinking at the Oxford Martin School; Department of Social Policy and Intervention, University of Oxford.

Abstract. In sociology and political science, social class is among the most commonly used indicators of command over economic resources. However, we know relatively little about how the nature of the relationship between social class and earnings varies across countries. In this paper, we utilize data from the European Union Statistics on Income and Living Conditions (EU-SILC) to study the relation between social class and earnings inequality across 30 European countries. We find that while working-class individuals have lower average earnings than their upper-class counterparts in all countries, there is considerable variation across countries in the earnings ratios. Class also contributes to overall earnings inequality. However, by using a variation of the Oaxaca-Blinder decomposition, we show that a sizeable share of between-class inequality can be accounted for by differences in the population composition of social classes. In sum, our results reveal that there is a non-negligible relationship between class and earnings, but the magnitude of class inequality, and how much class accounts for overall inequality, differs substantially across countries.

Keywords: social class, earnings, inequality, cross-national variation, Europe.

INTRODUCTION

Social class is a leading sociological concept to capture social and economic inequality (Rose and Harrison, 2010; Tåhlin, 2007). One of the underlying assumptions is that the social class a person belongs to – typically captured via occupational positions in the labour market – is a good indicator of command over economic resources, including income, economic security, economic stability and economic prospects (Erikson and Goldthorpe, 1992; Goldthorpe, 2007; Goldthorpe and McKnight, 2006). Since social class is seen as a good proxy for economic standing, it is often linked with a variety of outcomes, including health (Kunst and Roskam, 2010), psychological wellbeing (Richards and Paskov, 2016), social policy preferences (Brooks and Svallfors, 2010; Lipps and Oesch, 2018), and voting behaviour (Evans, 1999), to name a few. In this paper we argue that in order for social class to be a productive concept to measure and understand various dimensions of socioeconomic inequalities, we need more theoretical discussion and more empirical research on the association between social class and economic outcomes. In this paper we focus on the relationship between social class and earnings inequality.

Previous empirical studies have investigated the relationship between social class and various dimensions of economic outcomes, including income insecurity, short-term income stability and long-term income prospects (Bukodi and Goldthorpe, 2019), but also material deprivation and economic vulnerability broadly defined (Bedük, 2018; Lahtinen *et al.*, 2018; Lucchini and Schizzerotto, 2010; Watson *et al.*, 2010; Whelan and Maître, 2007, 2010). These studies generally conclude, although with some caveats, that class is associated with the

economic outcomes observed. Studies on select countries also suggest that there is a relationship between social class and earnings, including in the UK (Williams, 2013, 2017), in the US (Wodtke, 2016, 2017; Zhou and Wodtke, 2019), in Sweden (Bihagen *et al.*, 2010; Tåhlin, 2007), and in Italy (Albertini, 2013). In this paper, we want to expand our understanding of the relationship between class and earnings from a comparative perspective. We argue that earnings are a central dimension of economic advantage and disadvantage, and therefore, deserve special attention (cf. Kim *et al.*, 2018). Currently, there is very limited evidence on how the nature of the relationship between class and earnings differs across countries. The only comparative study that we are aware of, is Le Grand and Tåhlin (2013). This study compares 11 European countries but with a rather restricted European Social Survey 2004 data, involing a small sample size per country. The contribution of our paper is to provide a new updated account of the relationship between social class and earnings using high-quality data and a large sample size for 30 European countries. More specifically, we investigate two questions: First, how does the relationship between social class and yearly earnings vary across countries, and second, to what extent is cross-national variation in the class-earnings gradient a reflection of other factors that correlate with social class?

We argue that studying variation in earnings by social class is important to evaluate class as a theoretically relevant concept and as an analytically viable indicator for the command over economic resources. In a first step, we discuss what the theoretical literature suggests regarding the relationship between class and earnings. In a second step, we present an analytical strategy to shed light on class and earnings after taking into account compositional effects and different returns to other individual and household characteristics. This allows us to establish whether social class is a relevant indicator for the command of economic resources in its own right or via mediating mechanisms (Rose *et al.*, 2010).

In order to investigate the relationship between social class and earnings, we use 2017 data from the EU Statistics on Income and Living Conditions (EU-SILC). We define social class by one of the most widely used class-schemas in sociology – the EGP schema (Erikson and Goldthorpe, 1992). We use a harmonized version of this schema designed for comparative purposes (Rose and Harrison, 2010). We apply a regression-based decomposition inspired by the Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973). We modify the classical approach in such a way that it allows for computing adjusted earnings ratios of the upper class and working class and the intermediate class and the working class. Building on the same approach, we present a new way to decompose between-class earnings inequality, as measured by the mean logarithmic deviation, in observed and non-observed factors.

We contribute to the literature by (1) providing up-to-date evidence on the social class – earnings relationship for a large number of European countries, based on a survey that is specifically designed to measure earnings in a comparative setting; (2) paying attention not only to earnings differences between the upper class and the working class, but also to earnings inequality between the intermediate and working class; and (3) introducing a new approach for decomposing between-social class inequality in observed and non-observed factors. We find that while working-class individuals have lower average earnings than their upper-class counterparts in all countries, there is considerable variation across countries in the earnings ratios. Part of this variation can be accounted for by observable characteristics, but even then the earnings differences between working and upper classes remain significant, albeit reduced. Similarly, there is quite some variation across Europe in terms of the earnings gap between the intermediate class and the working class, and the extent to which observable factors can account for this variation also differs by countries. Notably, in some countries the intermediate class has, on average, lower earnings than the working class. Furthermore, we find that between-class

inequality contributes to overall earnings inequality, even when using a relatively crude three-class schema. Between-class inequality accounts for up to 27% of total inequality. However, in most countries this reflects to a large degree compositional differences between social classes. Finally, we show that there is considerable cross-national variation in the importance of specific characteristics of social classes for understanding class differences in earnings, pointing both to idividual-level and institutional factors which are liable to explain cross-national variation in the relationship between class and earnings.

The paper is structured as follows. We first introduce the concept of social class as a measure for the command over economic resources, and review different theoretical arguments regarding the relationship between social class and earnings as an indicator of economic outcomes. Subsequently, we discuss the data and methods we use in this paper. In the results section, we consecutively (1) highlight the cross-national variation in the relative size and composition of social classes; (2) describe the level of earnings inequality between social classes; (3) show to what extent the observed class differences in average earnings is a reflection of differences in class composition and returns to individual and household characteristics; (4) inquire deeper into which variables exactly contribute most to earnings differences between social classes; and (5) elaborate on the implications for the relevance of between-class inequality in total earnings inequality. We conclude with a reflection on the broader implication of our findings, and routes for further research.

THEORETICAL BACKGROUND

WHAT IS SOCIAL CLASS?

In sociology, social class theory aims at capturing where people stand in the economic structure. The general line of reasoning is that in market economies it is the market position – especially

the position in the labour market – that captures and defines social and economic advantages and disadvantages (Goldthorpe, 2007; Rose *et al.*, 2010; Wright, 1997). In very basic terms, positions higher in the class structure have access to advantaged social and economic conditions, positions lower in the class structure are exposed to disadvantaged social and economic conditions. While class schemas are not always hierarchical, the expectation is that at least when it comes to the very top and the very bottom of the class hierarchy, such social and economic distinctions should hold (Goldthorpe, 2007).

Two of the most widely cited modern day social class theorists, John Goldthorpe and Erik Olin Wright, both distinguish the top and the bottom classes in terms of authority and in terms of employment relations (Goldthorpe, 2007; Le Grand and Tåhlin, 2013; Tåhlin, 2007; Wright, 1997). Generally a distinction is made between people who buy and control the labour of others (employers), who sell their own labour directly to customers and clients (self-employed), and who sell their labour to employers and employing organisations (employees). When it comes to employees – the largest group – a further distinction is made based on the nature of their work and their relationship to the employer (Erikson and Goldthorpe, 1992; Goldthorpe, 2007; Wright, 1997). The upper class[1] of employees consists of managers and professionals who are in a special relationship with the employer – they are hired to provide a "service" to the employer, either to exercise delegated authority by managing other workers or to exercise knowledge and expertise on the behalf of the employer as is the case with highly skilled professionals. At the other end of the class spectrum are the working classes, most

[1] Known as the salariat class in Goldthorpe's schema (Goldthorpe, 2007) and known as the middle class in Wright's schema (Wright, 1997).

commonly manual and routine non-manual workers who possess relatively low, unspecialised and widely available capacities and skills. In contrast to the upper classes, the working classes are in a more basic and transactional relationship with the empoyer.

The assumption is that positions in the labour market and the employment relationships they entail will end up structuring a range of economic outcomes for the individuals who hold these posiitons. Those at the top of the class hierarchy, employers together with upper class employees, including managers and professionals, are in the best position in terms of being able to access a range of economic advantages and benefits that are distributed in the labour market or within the organization. Those at the bottom of the class hierarchy, the working classes, are in the least advantaged position to gain access to the various resources and benefits that are distributed in the labour market and the workplace. While there appears to be general agreement in the literature about what the general economic structure is and who belongs to the upper class and who belongs to the working class (Le Grand and Tåhlin, 2013), theoretical arguments do differ on what type of economic inequality we should expect to emerge between social classes, and why. Next we discuss these theoretical arguments applied to the relationship between class and earnings.

SOCIAL CLASS AND EARNINGS

Social science literature offers different perspectives on why we should expect a link between social class and earnings, if at all. From both Goldthorpe's and Wright's perspective, social classes differ in the nature of their work. The work of the upper classes – managers and professionals – requires more specific skills and expertise and it is harder for an employer to monitor. Therefore, employers are incentivised to promote the cooperation, loyalty, and work effort of the upper-class workers by providing them with a range of benefits. One could argue

that the benefit package that the employer offers to the upper classes is likely to include higher current earnings (the so-called 'efficiency wage', see among others Akerlof (1984)). However, according to Goldthorpe, it is not in the best interest of the employer to incentivise the upper class via current earnings, per se. Instead, what the employer offers to the upper-class workers are various other economic benefits such as (i) earnings security – low risk of job loss and unemployment; (ii) short-run earnings stability, week-to-week and month-to-month; and (iii) better long-term earnings prospects. From Goldthorpe's perspective, thus, there should be no direct causal link between class and current earnings, especially among younger age groups, unless via class differences in job security.

From Wright's (1997) perspective, however, we can expect a direct causal link between class and earnings. Similar to Goldthorpe, Wright acknowledges that the nature of the work that the upper classes is such that the employer is incentivised to think of strategies to foster the loyalty and commitment of upper class workers. However, according to Wright, wages are an important way of achieving that goal. The upper classes – especially managers – are incentivised to act in the interest of the employer by, in return, receiving higher wages and promotions. In addition to what is productive from the perspective fo the employer, Wright puts emphasis on the fact that the bargaining power differs depending on class positions. The strategic position of both managers and professionals within the organization enables them to actively engage in making claims and bargain for a portion of the profit in the form of higher earnings. Managers are thus in a good position to claim a "loyality rent" and professionals can claim a "skill rent". These arguments suggest a direct link between class and earnings. It is remarkable that both Goldthorpe and Wright pay relatively little attention to the 'intermediate classes' and how they are different from the upper and working class. In contrast, they focus primarily on the relation

between employers and employees, while in most empirical studies (including ours) the upper class and intermediate class both comprise employers and employees.

A related argument is made by the relational inequality theory, according to which class differences in earnings emerge due to class-differences in bargaining power and 'claims making ability' (Tilly, 1998; Tomaskovic-Devey and Avent-Holt, 2019).[2] Relational inequality theory offers a broader perspective of what drives wages, for instance, by considering that what is seen as a fair pay for a given productivity or skill level is also a social construct that is influenced by the power and perceived status of workers. Furthermore, some occupational or social class groups could extract more pay because of their relationship with the state. An example of this is occupational licencing, which limits supply and in turn increases the bargaining power of certain workers (Weeden, 2002). Overall, these perspectives suggest that social class positions would be directly linked to earnings.

A different perspective is provided by Tåhlin, who argues that class inequalities in earnings are not due to power or employment relations attached to different class positions but due to differences in the skills content of the jobs (Le Grand and Tåhlin, 2013; Tåhlin, 2007). From this viewpoint, workers in upper class positions have higher wages because their education, qualifications, and skills make them more productive and consequently they have higher market value which is rewarded with higher wages. What this perspective then implies is

[2] It is important to understand that while both Golthorpe's 'employment relations' theory and Tomaskovic-Devey and Avent-Holt's 'relational inequality theory' sound similar, they are in fact rather different. Golthorpe's theory is similar to human capital theory, he assumes that employers offer benefits to employees on grounds of efficiency and to promote worker's commitment. Tomaskovic-Devey and Avent-Holt, however, argue that labour market rewards are predominately determined by social relations, power, and claims-making ability within the organization.

that class is a good proxy for earnings inequality because it captures workers abilities and skills. Next to abilities and skills, other factors associated with class may explain why class inequalities emerge (Richards and Paskov, 2016). To the extent that social class is associated with relevant individual or household characteristics that are associated with earnings (e.g., gender, household composition), a relationship between class and earnings is likely to be empirically observed. Social class would then be linked with earnings but via those alternative pathways. Although as discussed by Rose and colleagues (2010), these alternative variables can also be seen as elements of social class inequalities, hence, supporting class theory.

In contrast to the above, according to or the 'death of class' perspective, social class is no longer a determinant of economic inequalities and life chances (Clark and Lipset, 1991). From this perspective, the link between class membership and individual outcomes is diminised due to technological, competitive, and political changes that have diminished the role of social class in determining economic standing and incomes. A shift away from large capital-intensive enterprises to the flourishing of more dynamic small firms are expected to make class divisions in earnings smaller. The post-class perspective, thus, predicts that the value of class as an analytical concept to understand social and economic inequalities should be minimal.

Prior studies have looked at the relationship between social class and earnings in select countries. Research shows that class wage-inequality holds in the UK over a longer time period since 1970s to 2000s (Williams, 2013) but also more recently over the Great Recession wage inequality between social classes in the UK has remained broadly stable (Williams, 2017). The same holds in the US where class is an important stratifier for wages (Wodtke, 2016, 2017; Zhou and Wodtke, 2019). Similar conclusions can be drawn for Italy (Albertini, 2013) and Sweden (Tåhlin, 2007). The only comparative study we are aware of is by Le Grand and Tåhlin (2013) who analyse the relationship between class and wages in 11 European countries. They conclude

that there is a class gradient in all countries but the wage-gap between classes differs across cuntries. A limitation of the Le Grand and Tåhlin's (2013) study is the fact that it is based on the 2004 European Social Survey with a very small sample size and the quality of earnings data is questionable. Therefore, in this paper we present an updated systematic analysis of the relationship between social class and earnings, using higher quality data in 30 European countries.

DATA AND METHODS

DATA AND TARGET POPULATION

To assess the relationship between social class and earnings across a broad range of countries, we make use of the EU Statistics on Income and Living Conditions (EU-SILC) microdata. EU-SILC is the main source for comparative research into earnings and income inequality in Europe, and covers all EU Member States, plus Iceland, Norway, Serbia and Switzerland. We make use of the 2017 data (release of Spring 2019), which excludes Iceland and Switzerland. EU-SILC is a survey among random samples of the population living in private households. The data are collected in a partially ex ante harmonised manner, though countries vary in sample design, mode of data collection (especially the use of survey data vs. register data), and questionnaire design (Atkinson *et al.*, 2017; Zardo Trindade and Goedemé, 2020). In most countries all household members aged 16 and over are interviewed, while in some countries a part of the questionnaire is carried out for selected respondents only (including Denmark, Finland, the Netherlands, Norway, Sweden and Slovenia). In all countries EU-SILC has some form of a complex sample design, and we take this as much as possible into account when

estimating standard errors and confidence intervals, in accordance with the procedures proposed in Goedemé (2013).

The target population for our study is the population at work, aged 18 (incl.) – 65 (excl.) and with earnings above zero in the income reference year. The income reference year is typically the year before the survey year (i.e. 2016), except for Ireland (earnings in the 12 months preceding the interview) and the United Kingdom (earnings in the current year). The sample size for our subsample of interest varies between 2,500 (Denmark and Sweden) and 17,000 individuals (Italy), that is, only including cases with observations for all relevant variables for this study.

VARIABLES

The two key variables in our study are earnings and social class. The dependent variable is yearly gross earnings, which refers to total earnings in the income reference year. Gross earnings include cash and near-cash income from employment as well as profits and losses from self-employment. In the case of France and Austria, employee income also includes the value of the private use of a company car[3]. We only include observations with total gross earnings higher than zero, and winsorize at the 999th permille. Next to average hourly wages, our measure also reflects the number of hours worked, spells of doing few hours due to flexible contracts and spells of sickness or un(der)employment.

[3] See Zardo Trindade and Goedemé (2020). Unfortunately, it is not possible to correct for this.

Social class is conceptualised and operationalized in accordance with the European Socio-Economic Classification (ESeC), which is specifically designed for international comparisons (Rose and Harrison, 2010). ESeC defines social class on the basis of employment status, size of the firm (in the case of self-employed), supervisory status (in the case of employees) and occupation. In EU-SILC 2017, occupations are classified in accordance with the International Standard Classification of Occupations (ISCO 2008), at the two digit level. Therefore, we use a simplified version of the original ESeC, which uses a more detailed ISCO code[4]. In most countries, this results in between 40 and 43 occupational groups. However, occupation is available only at a much more aggregated level in the case of Germany (9 groups), Ireland (25 groups), Malta (10 groups) and Slovenia (10 groups). We collapse the original ten-class version of ESeC into a three-class schema, as shown in *Table 1*. We do so to facilitate interpretation of the results (and to keep the amount of information presented manageable. Furthermore, based on class theory it is not always clear what we might expect regarding the earnigs of more disaggregated class schema. A downside of this approach is that overall inequality between social classes will appear to be lower than in a class structure with more social classes. An important consideration is whether and to what extent social class measures are valid across countries. In this paper we start from the assumption that ESeC captures social classes in a valid and comparable way across countries, in line with much of the comparative literature on this topic.

[4] We make use of the STATA do-file published on the GESIS website, which we slightly adapted (https://www.gesis.org/en/gml/european-microdata/eu-silc, last accessed 05/11/2019). More in particular, we first classify the self-employed into a group which indicates to have employees, and a group which indicates not to have any employees. Subsequently, we look at the size of the firm only for self-employed who indicate to have employees. More details on the construction of ESeC in EU-SILC can be found in Goedemé (2019).

We will shed some light on the cross-national variation in the composition of social classes below.

Table 1. Collapsing ESeC from 10 to 3 classes

ESeC class	10-class	3-class
High salariat	1	1+2
Lower salariat	2	
Higher white collar	3	3+4+5+6
Petit bourgeois	4	
Small farmers	5	
Higher grade blue collar	6	
Lower white collar	7	7+8+9
Skilled manual	8	
Semi-/non-skilled	9	
Never worked	10	excluded

Source: Rose and Harrison (2010).

The control variables include ones that are directly related to work and employment, as well as personal and household characteristics that also correlate to various degrees with earnings. Full-year, full-time equivalents (FYFTE) are a proxy for the number of hours worked in the income reference year, compared to the typical full-year full-time worker in the country of residence. Each month for which the respondent reports to have worked full-time (FT) is counted as 1/12. Months in which the person indicates to have worked part-time (PT) are multiplied by a factor

that represents the number of hours worked, divided by the median number of hours worked by full-year full-time employees in that country. If the stated number of hours for part-time employees is higher than the median number of hours worked by full-time employees, we assume that it is equal to the median number of hours, and the person has worked full-time rather than part-time. Unfortunately, EU-SILC only contains information on the number of hours worked in a 'typical week' at the time of the interview, so if the number of hours have changed over the past year, this measure will not be fully accurate. The equation below describes the computation in more detail:

$$FYFTE = \left(months_{FT} + months_{PT} * min\left(1, \frac{hours\ worked\ in\ typical\ week}{median\ hours\ in\ country}\right)\right) * \frac{1}{12}, \quad (1)$$

with 'median hours in country' referring to the self-reported typical number of hours worked in a week (at the moment of interview), for employees who reported to be full-time at work for the entire reference period.

Highest level of education is added as a control variable in three categories: (i) lower secondary and below; (ii) higher secondary and post-secondary, non-tertiary; (iii) tertiary education. We also included several variables related to employment and labour market participation: number of years since the start of the first regular job, whether or not someone is on a temporary contract, and economic sector of activity. We measure the sector of employment in 13 categories (NACE, Statistical classification of economic activities in the European Community). Furthermore, we control for a range of personal characteristics, including gender, health status, disability status, and immigration status. Health status refers to whether or not people feel (very) limited in the activities they usually do because of health problems for at least the past six months. Disability status reflects whether someone received disibility benefits in the income reference year, while immigration status indicates whether someone was born outside the

current national territory. Finally, we also include household type as a control variable, by including dummies for the following six types: a single person household; a multi-person household without children and exactly one earner; a single-parent household; a one-earner household with at least one child and one non-earning adult; other households without children; other households with children.

METHODS

Decomposition of the between-class ratio of average earnings

We use two different indicators of inequality: the ratio of average earnings in the upper or intermediate class and the working class, and the mean log deviation. The ratio of average earnings is the most tangible one, however, it does not provide an overall picture of earnings inequality and the relation between social class and earnings inequality. Therefore, we complement the picture with a decomposition of the mean log deviation.

To compute the ratio of average earnings by social class, we first compute the natural logarithm of earnings for each respondent in the sample, then calculate the average of the log of earnings for each social class, and subsequently compute the ratio of the exponent of the average for each social class. The equation below illustrates the earnings ratio of the upper and working class.

$$Earnings\ ratio = \frac{\exp\left(\overline{ln(earnings_{upper\ class})}\right)}{\exp\left(\overline{ln(earnings_{working\ class})}\right)}. \quad (2)$$

We take this approach for three reasons: (1) In principle it may be preferable to work with the median as this represents better the 'typical' earnings of persons belonging to the same social class. However, a regression-based decomposition of the median (making use of quantile

regressions) is less attractive than an OLS based decomposition of the mean for reasons explained below. (2) Regression-based decompositions of earnings are typically carried out starting from the natural logarithm of earnings, because returns to individual and household characteristics are expected to follow a loglinear pattern rather than a linear pattern. (3) The distribution of residuals can be expected to approximate much more closely a normal distribution when regressing the log of earnings on other variables, rather than untransformed earnings. To preserve consistency between the bivariate and multivariate analyses, we work with the log of earnings also in the bivariate analysis.

We apply a shift-share approach to decompose the difference in average earnings between social classes into three elements: (1) observed differences in the average composition of each social class (e.g. in terms of hours worked, education, gender, economic sector, …); (2) observed differences between social classes in returns to these characteristics; (3) a remaining difference between social classes after controlling for these observed factors.

The estimation strategy is as follows: we estimate an OLS regression of the log of earnings, adding a dummy for each class and other covariates. All covariates are interacted with the class dummies to allow for differences in returns to individual and household characteristics between social classes. To estimate the separate effect of differences in population composition with respect to various variables, we always use a model where all covariates are included, given that not doing so would result in omitted variable bias with respect to the compositional effect of the variable of interest. The regression results allow us to re-estimate the ratio of average earnings of both classes, controlling for the difference in the composition of the population. This is different from the more widespread Oaxaca-Blinder type of decompositions (Blinder, 1973; Oaxaca, 1973), which would start from a separate regression for each social class, but we

prefer this approach, as it allows for a very intuitive grasp of the 'remaining gap' in average earnings between social classes after controlling for compositional effects, and because it allows to identify the contribution of compositional effects as compared to the contribution of class-differences in returns to individual and household characteristics.

In the first instance, to identify the contribution of the difference in population composition of each social class, we fit an OLS regression of the following format, for each country separately:

$$\begin{aligned}\ln(earnings) = {} & \beta_0 + \beta_{11} class_1 + \beta_{12} class_2 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_z x_z \\ & + \beta_{i21} x_2 class_1 + \beta_{i22} x_2 class_2 + \beta_{i31} x_3 class_1 \\ & + \beta_{i32} x_3 class_2 + \ldots \beta_{iz2} x_z class_2 + u\end{aligned} \quad (3)$$

with *class* being dummy variables which take the value of 0 for the working class and the value of 1 either for the upper class (class 1) or the intermediate class (class 2). $x_2 \ldots x_z$ represent a list of covariates and $b_2 \ldots b_z$ the accompanying list of regression coefficients. Subsequently, we add a series of interactions between the two social class dummies and each of the covariates. The addition of the interaction between social class and each covariate implies that we estimate the returns to each characteristic (in terms of earnings) separately for each social class. *u* represents the error term. The fit of the model is satisfactory, but varies considerably between countries. The R-squared ranges from 0.23 in Hungary to 0.76 in Cyprus. The residual degrees of freedom and R-squared values are summarised in Table A1 in the Appendix.

We identify compositional effects on the earnings ratio in two steps. In the first step, we re-estimate the ratio of average earnings of the upper class or intermediate class and the average earnings of the working class, as follows (illustrated for the upper vs. the working class):

$$Earnings\ ratio = \frac{\exp\left(\beta_0 + \beta_{11} + \beta_2 \overline{x_2}_1 + \beta_3 \overline{x_3}_1 + \ldots + \beta_z \overline{x_z}_1 + \beta_{i21} \overline{x_2}_1 + \beta_{i31} \overline{x_3}_1 + \ldots + \beta_{iz1} \overline{x_z}_1\right)}{\exp\left(\beta_0 + \beta_2 \overline{x_2}_w + \beta_3 \overline{x_3}_w + \ldots + \beta_z \overline{x_z}_w\right)}, \quad (4)$$

where each of the regression coefficients is multiplied with the class average of the corresponding covariate (with subscript *1* indicating upper class and *w* working class). By adding to the numerator the coefficient of the class dummy, as well as the coefficients relating to the upper class-specific interaction effects, and omitting those in the denominator, the ratio of average earnings is re-estimated, in this case for the upper class and working class. A major advantege of using an OLS regression, is that if the ratio is re-estimated by imputing average population characteristics that apply to each class, then the outcome is the same result as the unconditional ratio of average earnings (equation (2)). In contrast, if we would use a quantile regression to estimate the median of each social class, the predicted ratio of medians would not be the same as the initial, bivariate result.

In a second step, the ratio can be re-estimated by replacing the class-specific averages of each covariate with the average charactistics of the overall population[5]. In other words, $\overline{x_{2}}_1, \overline{x_{3}}_1, \ldots, \overline{x_{z}}_1$ and $\overline{x_{2}}_w, \overline{x_{3}}_w, \ldots, \overline{x_{z}}_w$ in the equation above, are replaced with $\overline{x_{2}}_p, \overline{x_{3}}_p, \ldots, \overline{x_{z}}_p$, both in the numerator and the denominator. In order to get some more insight into the contribution of specific groups of variables, we replace the class-specific averages cumulatively by block of variables.

[5] Which 'average' is imputed (either of one class, an average, or something else) can make a difference to the outcome. In Oaxaca-Blinder decompositions this is called the 'index number problem'. In our case it makes most sense to work with the average characteristics in the target population, as it represents the case in which all members of the population would be randomly allocated to social classes, or, alternatively, the case in which the average composition of each social class would be similar to the one in the total population.

In a next step, we estimate the additional effect of differences in returns to individual and household characteristics between social classes. This is done by re-fitting the regression model as specified above, but now leaving out the interaction between social class and the covariates. Subsequently the ratio is re-estimated as previously, using population averages for all covariates, both in the numerator and denominator. This shows the additional effect of differences in returns, on top of the 'effect' of differences in the composition of social classes. For each of these steps we evaluate the extent to which it affects the cross-national variation in the ratio of average earnings of the upper class or intermediate class and the working class. Importantly, this is a pure 'accounting' exercise, the results should not be interpreted in a causal way.

An overall measure of adjusted and unadjusted between-social class inequality

While the ratio of average earnings of social classes gives a very intuitive impression of earnings inequality between social classes, it is hard to sum it up to an overall measure of between social class inequality. Therefore, we also carry out a more formal decomposition of total earnings inequality in within social class inequality and between social class inequality. To do so, we make use of the mean logarithmic deviation (MLD)[6], a widely used inequality measure. The three main reasons for using the MLD are: (1) it is additively decomposable into a between-group and a within-group component, and it does not matter which component is computed first; (2) it is an inequality-measure with various theoretically attractive properties, respecting both the principle of transfers and the principle of monotonicity in distance; (3) the index is relatively

[6] The mean logarithmic deviation is also known as the Theil(0) index.

sensitive to differences across groups/countries in the tails of the distribution[7]. The MLD can be computed as follows:

$$MLD = \frac{1}{N}\sum_{i=1}^{N} ln\left(\frac{\bar{x}}{x_i}\right). \quad (5)$$

In other words, it is equal to the average logarithm of the ratio of average earnings and the earnings of each member of the target population. This can also be written as follows:

$$MLD = \frac{1}{N}\sum_{i=1}^{N}\big(ln(\bar{x}) - ln(x_i)\big) = ln(\bar{x}) - \sum_{i}^{N}\frac{ln(x_i)}{N}. \quad (6)$$

Furthermore, when identifrying three groups (classes) in the population, it could also be rewritten as follows:

$$MLD = ln(\bar{x}) - \sum_{c=1}^{3}\sum_{i=1}^{N_c}\frac{N_c}{N_c} * \frac{ln(x_{ci})}{N}. \quad (7)$$

With s standing for the share in the total population, this can be simplified such that the second term reflects the weighted average of the average of the log of earnings in each class:

$$MLD = ln(\bar{x}) - \sum_{c=1}^{3} s_c\,\overline{ln(x)}_c. \quad (8)$$

The MLD is decomposable in within and between group inequality. To do so, we add and subtract an additional term, which represents the weighted average of the log of average earnings in each group.

$$MLD = [ln(\bar{x}) - \sum_{c=1}^{3} s_c * ln(\bar{x}_c)] + \left[\sum_{c=1}^{3} s_c * ln(\bar{x}_c) - \sum_{c=1}^{3} s_c\,\overline{ln(x)}_c\right]. \quad (8)$$

[7] We are very grateful to Juan Gabriel Rodriguez for suggesting the MLD on the basis of these three characteristics.

The first two terms represent the MLD of average earnings in each group, whereas the second two terms can be easily rewritten to represent the weighted average of the MLD within each group.

What we would like to add here, is that it is possible to re-estimate the level of between-group inequality in way that is very similar to the approach that we took for estimating the adjusted ratio of earnings of the upper or intermediate class and the working class, as explained above. To do so, we fit a regression as highlighted before, but with two modifications. (1) Now we use earnings as a dependent variable, rather than the log of earnings[8]. (2) We do not include interaction effects, as we want to control for all observable factors, including differences between classes in the returns to individual and household characteristics. Subsequently, it is possible to re-estimate between-group inequality as measured by the MLD, making use of the estimated regression coefficients. More precisely, average earnings in the total population is equal to the predicted weighted sum of average earnings of each social class. Average earnings of each social class can be estimated with the regression outcome in exactly the same way as we did for estimating the ratio of the log of earnings (cf. equation 4). By changing the average value of the covariates for each social class into the average in the population, an 'adjusted' measure of between-group inequality can be computed, which reflects the counterfactual case in which each social class would have the same average composition as the one in the total population.

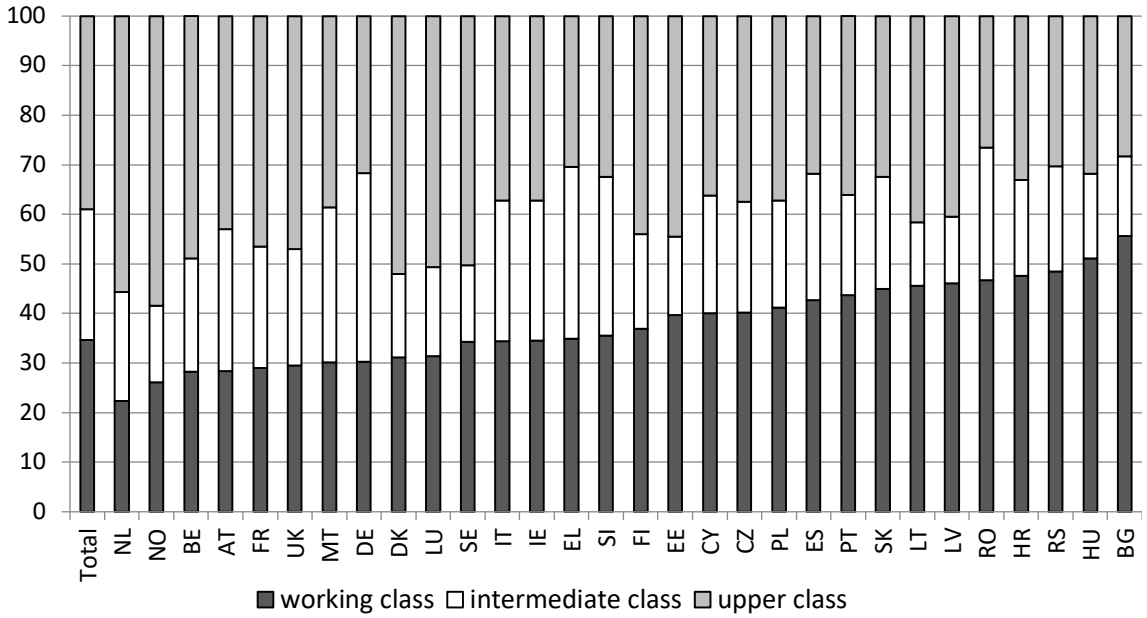
[8] Starting from the log of earnings and subsequently taking the exponent would result in a different measure of the MLD. While this had some attractive features with regard to outlying values in the case of the earnings ratio, this is not the case for the MLD, as it is a measure designed to measure the dispersion in earnings, including outlying values.

RESULTS

THE SIZE AND COMPOSITION OF SOCIAL CLASSES ACROSS EUROPE

Figure 1 depicts the social class structure of the working population across Europe. On average, the working class accounts for about 35%, the intermediate class for about 26% and the upper class for the remaining 39% of the active population. The relative size of each of the classes differs across countries. The size of the working class is the largest in Eastern Europe and relatively small in Western Europe and ranges from around 20% in the Netherlands to over half of the active population in Bulgaria. The size of the upper class is not a perfect mirror image of the size of the working class. The size of the upper class is close to or above 50% in the Nordic countries and the Netherlands, and 30% or below in Greece, Serbia, Bulgaria and Romania. For the countries in between, no clear geographical pattern emerges: the upper class is relatively small in, for instance, Germany and Hungary, and relatively large in Estonia, France, the United Kingdom and Belgium. The pattern is even more diverse with regard to the relative size of the intermediate class, ranging from around 15% of the active population in Norway, Latvia and Lithuania, and about 25% in France, Poland and Spain, to 35% or more in Greece and Germany.

Figure 1. The distribution of social classes in 30 European countries, EU-SILC 2017



Note: The total reflects a population-weighted aveage of all countries in the sample.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

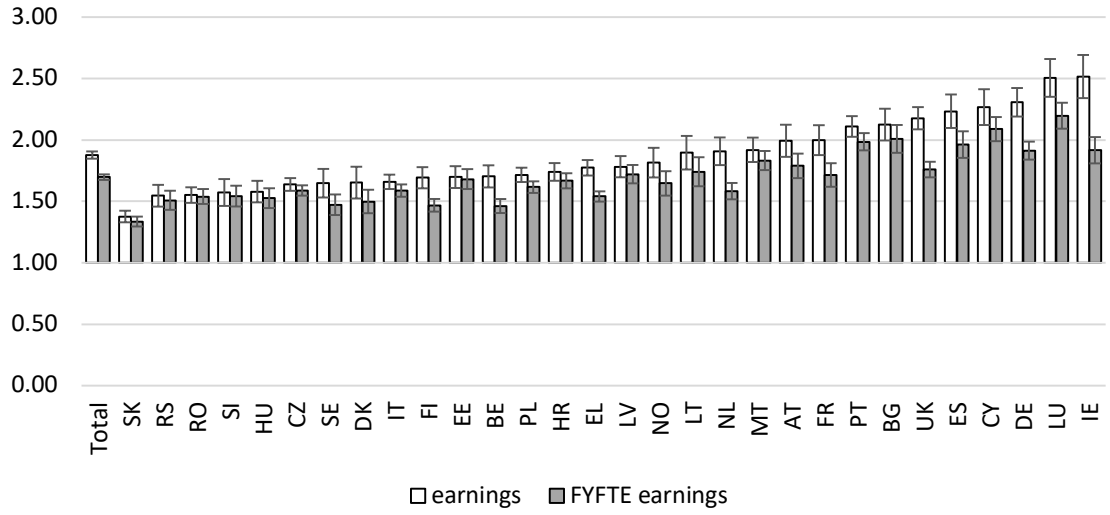
Not only the size, but also the composition of social classes varies substantially across countries. For instance, while the self-employed account for about 20% of the upper class in Greece and Italy, their share is close to or less than 5% in countries as diverse as Norway, Malta, Romania and Croatia. In most countries the share of the self-employed is considerably larger in the intermediate class, but again with large cross-national variation. While the self-employed account for less than 10% of the intermediate class in Germany and Denmark, their share is 50% or more in Lithuania, Poland and Greece, and as high as 80% in Romania. The average profile of social classes also varies in many other respects, both within and across countries. For instance, the amount of time spent in paid work in the previous calendar year is the lowest for the working class and this holds in all countries. The time spent in paid work is particularly low

among the working class in Belgium, the Netherlands, Germany, the United Kingdom and Ireland. Strong variations in class profiles are also found with respect to other variables, such as gender, immigration status and the highest degree of education achieved. However, with regard to the average health profile of social classes, the difference between classes within countries and of classes across countries is more moderate. In sum, due to the variation in Europe in the composition of social classes, both within and across countries, it would not be surprising to find that (1) on average, earnings in one social class are higher than earnings in another class; (2) the extent to which average earnings levels differ, varies between countries. Such differences may clearly influence observed earnings differences between social classes, so it will be important to take them into account in our analysis.

DIFFERENCES IN EARNINGS LEVELS BETWEEN SOCIAL CLASSES

In most countries, there is a sizeable gap between the average earnings of the upper class and those of the working class (see Figure 2). On average, across all countries in our sample, average earnings of the upper class are 1.9 times as high as those of the workign class. However, earnings ratios vary considerably across countries. In some of the Eastern European and Nordic countries the average earnings of the upper class are around 1.5 times as high as the earnings of the working class, while in Luxembourg and Ireland, the upper class earns around 2.5 times as much as the working class. Correcting for the number of hours at work over the previous calendar, on average, leads the ratio of average earnings between the upper and the working class to drop from 1.9 to 1.7. The drop is larger in countries with a relatively big gap between the upper class and the working class earnings, including Ireland, Luxembourg, Germany and the United Kingdom, but also the Netherlands. Overall, even after accounting for the hours worked, both the variation across countries in the ratio between the upper and working class, and the level of the ratio within countries, remains large.

Figure 2. The ratio of average earnings of the upper class and the working class, EU-SILC 2017

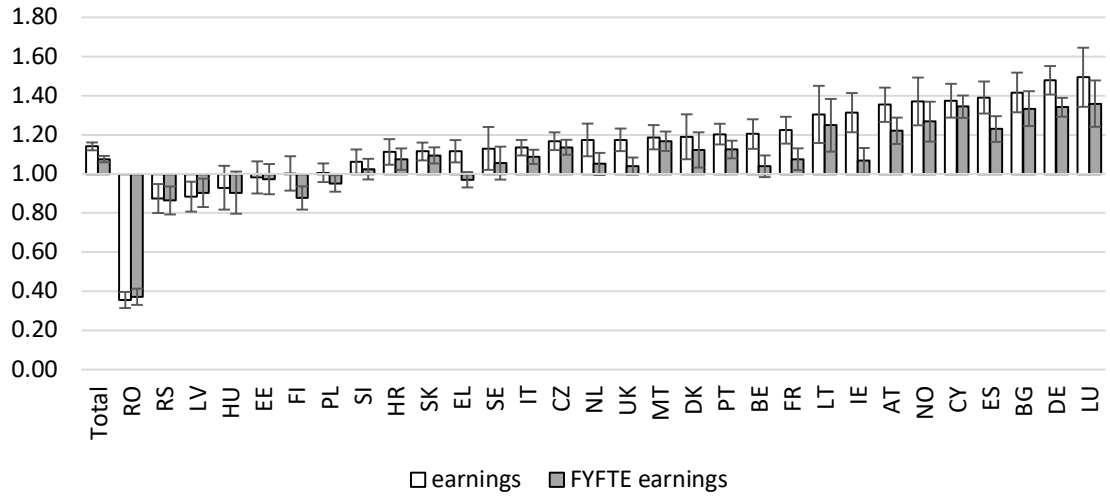


Note: FYFTE = full-year, full-time equivalent. Earnings were first transformed by computing the natural logarithm, subsequently the exponent of the average value of the transformed earnings was estimated. The total reflects a population-weighted aveage of all countries in the sample. 95% confidence intervals shown.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

Figure 3 illustrates that the average earnigns difference between the intermediate class and the working class is much more moderate, as is the variation in this respect across countries (leaving Romania out of consideration). Earnings of the intermediate class are, on average, about 14% higher than those of the working class. However, countries differ. In some countries, average earnings of the intermediate class are in fact lower than those of the working class, this holds in Serbia and Lithuania, and especially Romania. This is very different in Luxembourg and Germany where the intermediate class earns, on average, about 50% more than the working class. Again, the the intermediate and working class earnings-gap is reduced to a varying extent when earnings are expressed in full-year, full-time equivalents.

Figure 3. Ratio of average earnings of the intermediate class and the working class, EU-SILC 2017



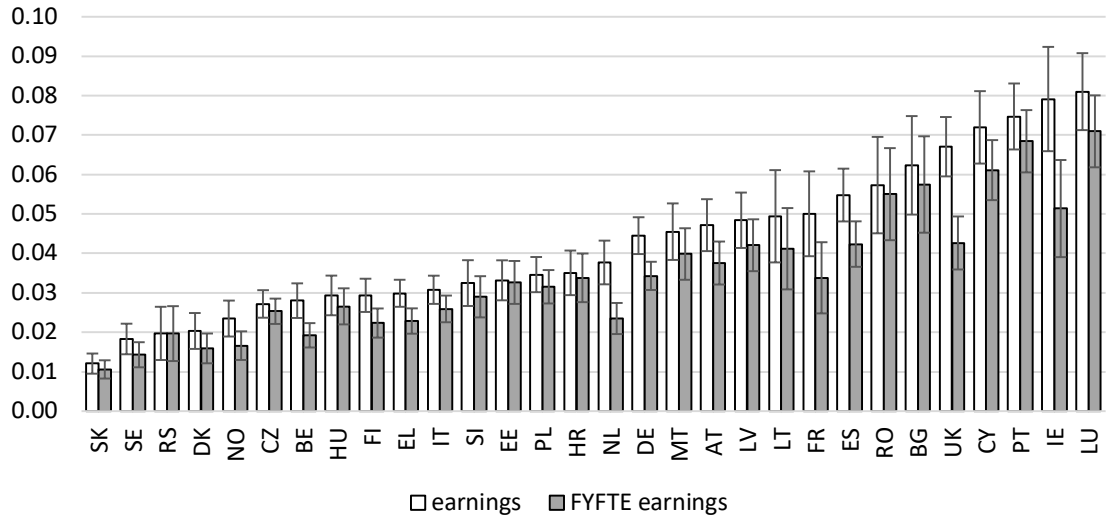
Note: X-axis crosses Y-axis at 1. FYFTE = full-year, full-time equivalent. Earnings were first transformed by computing the natural logarithm, subsequently the exponent of the average value of the transformed earnings was estimated. The total reflects a population-weighted aveage of all countries in the sample. 95% confidence intervals shown.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

The inequality observed between the upper class and working class, as well as between the intermediate class and working class can be summarised into an overall estimate of earnings inequality between social classes. This can done by computing the mean logarithmic deviation of earnings, and decomposing it into within and between social class inequality. As can be observed from Figure 4, the highest levels of between social class inequality can be found in Luxembourg, Ireland, Portugal, Cyprus, and the United Kingdom. Between class inequality is

much lower in countries like Slovakia, the Nordic countries, Serbia, the Czech Republic and Belgium. For many countries, expressing incomes in full-year, full-time equivalents makes a substantial difference. Earnings inequality between classes is especially reduced in Ireland and the United Kingdom, as well as France and the Netherlands. Nevertheless, substantial amounts of inequality between social classes remain, while also substantial variation across countries persists.

Figure 4. Overall earnings inequality between social classes, mean logarithmic deviation, EU-SILC 2017



Note: FYFTE = full-year, full-time equivalent. 95% confidence intervals shown.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

'NET' DIFFERENCES IN AVERAGE EARNINGS BETWEEN SOCIAL CLASSES

We have noted that the composition of social classes differs in many respects in terns of characteristics one would expect to also be associated with earnings. To account for these factors, we construct a counterfactual scenario in which the average characteristics of social classes are kept constant. Furthermore, we take into account that the returns to these observed characteristics (e.g. the extent to which the higher educated earn more than the lower educated) may vary between social classes. By taking out these differences, it becomes possible to see more clearly to what extent we can attribute earnings inequality (in a statistical or accounting sense) to social class itself, rather than to any of the other observable characteristics. This will help to better understand to what extent the variation across countries in between-class inequality is due to differences in social class profiles.

Figures 5 and 6 summarise the counterfactual analysis, by showing the ratio of average earnings of the upper class compared the working class (Figure 5), and the intermediate compared to the working class (Figure 6), in two scenarios. First, the simple bivariate case (i.e. the same as in the graphs above), and second, a scenario in which we assume that, on average, the returns to individual and household characteristics are the same, and within each country the composition of each social class in terms of observed characteristics is on average the same. The analysis is carried out for each country separately. The main takeaway messages are as follows:

(1) Observable factors do indeed account for a sizeable part of the bivariate difference in average earnings between social classes. On average, the ratio of average earnings of the upper class and working class drops by about 26%, varying between a 10% drop in Slovakia and a 38% drop in Spain. Yet, in all cases the ratio remains substantially above 1, varying between 1.1 in Hungary and 1.6 in Bulgaria. In 28 out of 30 countries average earnings of the upper class are still around

20% or more above those of the working class. In contrast, the earnings ratio of the intermediate class and working class changes on average with about 15%, but varying between a reduction of 28% in Spain and an *increase* of about 105% in Romania. Remarkably, the number of countries in which the ratio of average earnings is not significantly different from 1 (at the 95% confidence level) increased from 5 to 12. Only in three countries (Germany, Cyprus and Bulgaria) the intermediate class earns on average at least 10% more than the working class[9] and in no less than seven countries average earnings of the intermediate class is significantly *lower* than those of the working class.

(2) Given this variation in the effect of controlling for observables, it is clear that the upper class compared to the working class, or the intermediate class compared to the working class, are much more different in some countries than in others. Moreover, genereally speaking, the higher the bivariate ratio of average earnings, the stronger the reduction in this ratio when accounting for observables.

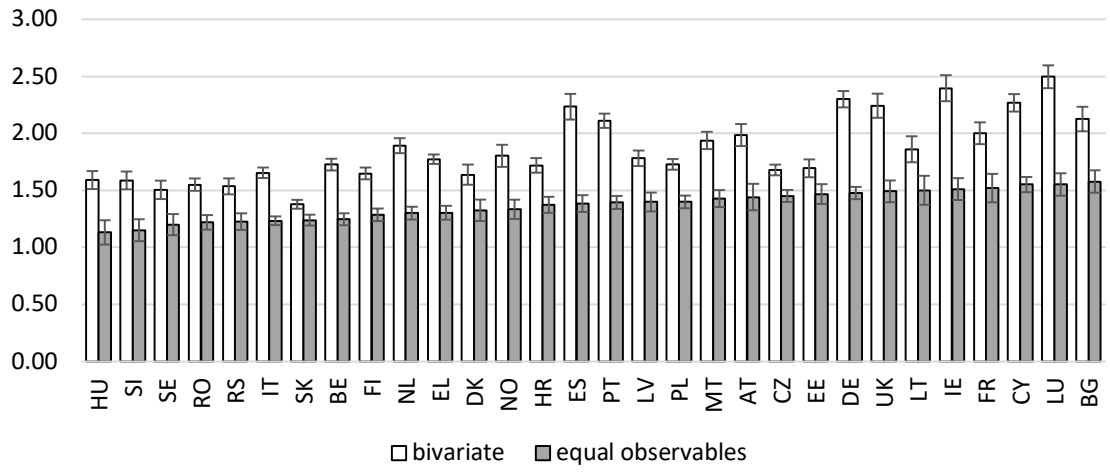
(3) This also implies that the cross-national variation in the ratio of average earnings of the upper class and working class, or the intermedicate class and working calss, is substantially smaller after controlling for observable factors. In the case of the upper class and the working class, the coefficient of variation of the earnings ratio was 0.15 in the bivariate case and decreases to 0.09 after controlling for observable factors. In the case of the earnings ratio of the intermediate and working class, the coefficient of variation drops from 0.19 in the bivariate case to 0.11 when controlling for observable factors.

---

[9] That is, only counting countries where there ratio is statistically signifcantly above 1.1, at the 95% confidence level.

(4) Finally, across countries, the ranking of countries in both scenarios is positively correlated, the Pearson rank correlation coefficient of both scenarios is 0.82 in the case of the the upper class and working class, and it is 0.85 in the case of the intermediate and working class. However, quite a few countries change their position considerably. Examples of countries where observable factors make most of a difference are, in the case of the earnings ratio of the upper class and working class, the Netherlands and Spain, which moved in the counterfactual scenario about 10 positions down in the ranking of countries, and the Czech Republic and Estonia, which moved at least 11 positions up. When we look at the earnings ratio of the intermediate class and the working class, Spain, Ireland and Slovakia changed their position most in the counterfactual scenario.

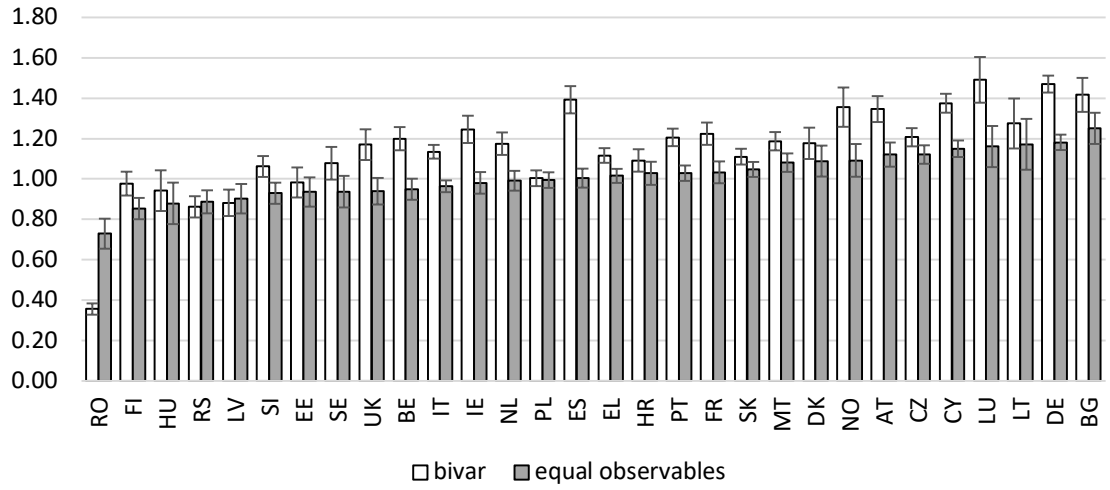
Figure 5. Ratio of average earnings of the upper class and working class, before and after controlling for observable differences in population composition and returns to individual and household characteristics, EU-SILC 2017



Note: The bivariate results displayed in the graph differ for several countries from those in the graph shown above, due to a (not entirely random) number of missing observations for the covariates in the regression. This is especially the case for the Czech Republic, Finland, Ireland, Sweden, and the United Kingdom. 95% confidence intervals shown.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

Figure 6. Ratio of average earnings of the intermediate class and working class, before and after controlling for observable differences in population composition and returns to individual and household, EU-SILC 2017



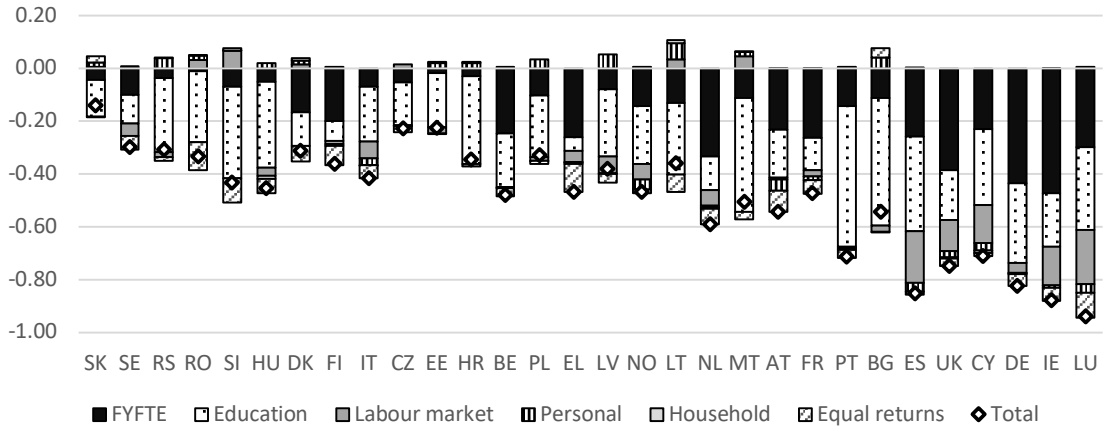
Note: The bivariate results displayed in the graph differ for several countries from those in the graph shown above, due to a (not entirely random) number of missing observations for the covariates in the regression. This is especially the case for the Czech Republic, Ireland, and Sweden. 95% confidence intervals shown.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

DETAILED DECOMPOSITION OF THE CONTRIBUTION OF OBSERVABLE FACTORS

Next we look at which observable factors actually contribute to the change in the ratio of average earnings in the counterfactual scenario. To gain some insight into this, in the graphs below we break down the difference between the ratio in the bivariate case and the ratio in the counterfactual scenario, into several components. First, we gradually and cumulatively adjust for differences in the composition of social classes, by assuming the national average value for each class rather than the class average. In other words, in a first step we still allow for potentially different returns to individual and household characteristics by social class, but we assume that, on average, social classes have, on average, the same population composition with respect to (1) the number of hours worked in the previous calendar year ("FYFTE"); (2) educational profile ("Education"); (3) economic sector of employment, being on a temporary contract and potential length of professional career ("Labour Market"); (4) gender, health, disability, and immigration status ("Personal"); and (5) household type ("Household"). We assume a similar profile in each of these five areas in a cumulative way: the graphs below show the additional change in the earnings ratio compared to the previous set of assumptions, when cumulatively substituting the class profile with the national average profile for each of the five areas. In a final step, we additionally assume that returns to these variables are the same across classes ("Equal returns"). The sum of the stacked bars in the graphs, is equal to the total difference between the bivariate and counterfactual earnings ratios as presented in the previous section. We first discuss the factors that contribute to the change in the earnings ratio of the upper class and working class.

Figure 7. Absolute change in the ratio of average earnings of the upper class and working class when cumulatively equalising the average population composition and returns to covariates, EU-SILC 2017



Note: Countries ordered from low to high ratio, before controlling for background characteristics. FYFTE = full-year, full-time equivalent hours.

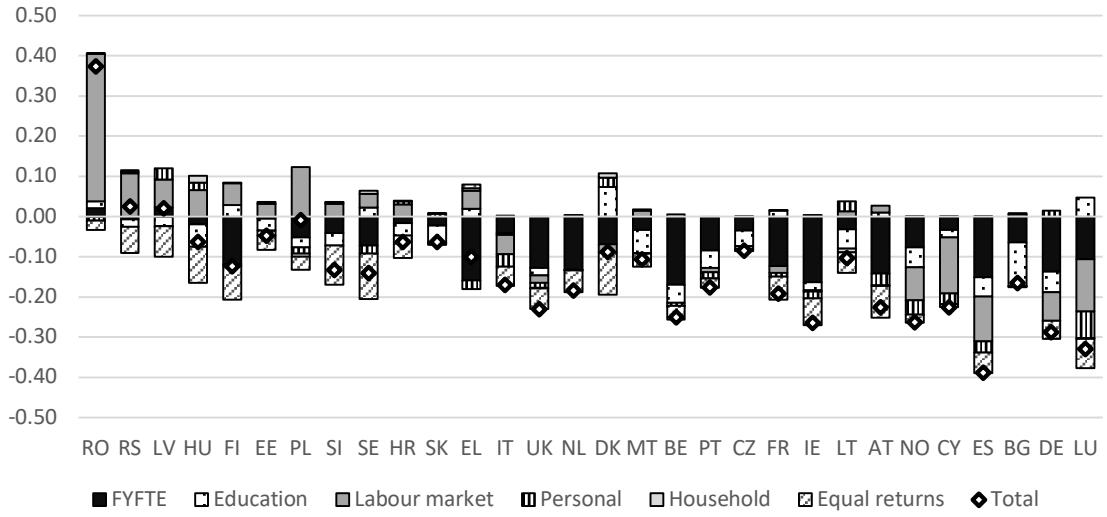
Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

As highlighted before, accounting for hours worked is an important factor in many countries. However, there are a number of countries where differences in the educational profiles matter at least as much, if not more, for understanding the earnings gap between the upper class and the working class. This is especially so in Eastern and Southern Europe, with the notable exception of Greece. Controlling for differences in hours worked and education profile leads in all 30 countries to a reduction in the ratio of average wages. In contrast, averaging out differences in labour market profiles increases the earnings ratio in a number of countries, including Romania, Slovenia, Lithuania and Malta. Yet, in five out of six countires with the highest earnings ratios, labour market profiles contribute to a sizeable reduction in the earnings ratio. In most countries the effect of a different labour market profile of the working class and

upper class is muich smaller than differences in hours worked and level of education, though. Overall, the contribution of class differences in personal characteristics and especially in household characteristics is very small. Latvia and Lithuania are an exception, where differences in personal characteristics have a reducing effect on the earnings ratio (as averaging them out increases the earnigns ratio). Finally, we assess the change in the counterfactual earnings ratio when additionally assuming equal returns to individual and household characteristics. Again, the additional change in the earnings ratio varies widely, with the most remarkable changes observed in Greece, Romania, Slovenia and Luxembourg, and to a lesser extent Austria, Finland and Lithuania. In most countries, differences in returns do not contribute much to the earnings ratio, however.

In sum, differences in educational profiles and number of hours worked in the previous calendar year seem to account for a sizeable share of the gap in average earnings between the working and upper class, in many countries in the sample. In some countries, though, differences in employment characteristics are at least as important, while (additional) differences in personal and household characteristics and in returns to the covariates seem to contribute relatively little to the earnings gap in the large majority of countries. These findings hold when earnings rather than the log of earnings are regressed on social class and the other covariates, although in that case differences in educational profiles seem to play an even more outspoken role, while the number of hours worked is in all countries relatively less important (see Appendix).

Figure 8. Absolute change in the ratio of average earnings of the intermediate class and working class when cumulatively equalising the average population composition and returns to covariates, EU-SILC 2017



Note: Countries ordered from low to high ratio, before controlling for background characteristics. FYFTE = full-year, full-time equivalent hours.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

The weight of these components is considerably different in the case of the earnings ratio of the intermediate and working class. Also, as is the case for the earnings ratio of the upper and working class, there is a strong variation in the relative importance of background characteristics. While controlling for the number of hours worked reduces the gap between the intermediate and working class considerably in many countries, and especially so in the 'old' EU Member States, controlling for education does not seem to matter that much. Notable exceptions are Denmark and Luxembourg, where differences in educational profiles contribute to a lower earnings ratio in the bivariate case, and Bulgaria and Malta, where differences in educational profiles contribute to a higher earnings ratio.

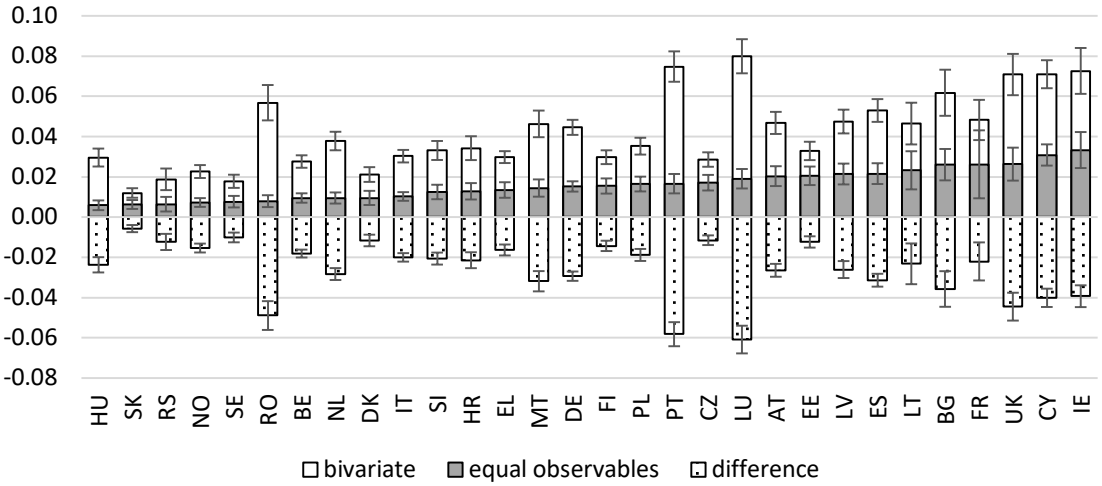
It is remarkable that in quite a few countries the class profile in terms of employment characteristics makes a bigger difference than its educational profile. This is especially the case in countries with a rather low earnings ratio, and those with a relatively high earnings ratio, where in both cases controlling for differences in employment profiles matters a lot for understanding the gap in average earnings. This applies in particular to Romania, where about 46% of the intermediate class are self-employed 'market-oriented skilled agricultural workers' without employees, while in total (including employees) about 60% of the intermediate class works in the agricultural sector. With the exception of Luxembourg, personal characteristics do not play any role, and neither do class differences in household profiles. In contrast, averaging the returns to characteristics across the two classes seems to be relevant for relatively many countries, especially if compared to the earnings ratio of the upper and working class. Its role is especially relevant in Hungary, Finland, Slovenia, Sweden, Denmark and Austria.

In sum, the relative importance of the groups of observable factors is somewhat different compared to the findings for the earnings ratio of the upper class and working class. In particular, it is remarkable that differences in educational profiles seem to be much less relevant for understanding the earnings ratio, with very few exceptions. In contrast, returns to individual and household characteristics and differences in employment profiles seem to play a more important role, next to controlling for the number of hours worked. These findings hold when regressing earnings rather than the log of earnings on social class and the other covariates, although in that case, differences in hours worked have in all countries a relatively smaller role, while differences in returns to background characteristics in a large number of countries seem to matter even more for understanding earnings differences between the intermediate and the working class (see Appendix).

OVERALL EFFECT ON BETWEEN-SOCIAL CLASS INEQUALITY

In a similar way, it is possible to recompute overall between-class inequality on the basis of the predicted average earnings in each social class, while assuming that the average profile and returns to background characteristics would be equal to those in the total population. The results of this computation are shown in Figure 9. Controlling for observalbe factors reduces between-class inequality quite substantially in nearly all countries. In 24 out of 30 countries adjusted between-class inequality is at least 50% below the unconditional between class inequality level. Only in Estonia it is less than 40% lower. The strongest absolute reductions in between-class earnings inequality can be found in Luxembourg, Portugal, Romania and the United Kingdom, followed by some other countries with a relatively high level of between-class inequality. In terms of the relative decrease in between-class inequality, also Hungary and the Netherlands should be mentioned. Given the relatively strong negative correlation between unconditional earnings inequality and the reduction in inequality in the alternative scenario, the variation between countries in between-class inequality is substantially smaller when controlling for observable characteristics.

Figure 9. The mean log deviation of between social class earnings inequality before and after controlling for observable characteristics (including differences in returns to individual and household characteristics), EU-SILC 2017

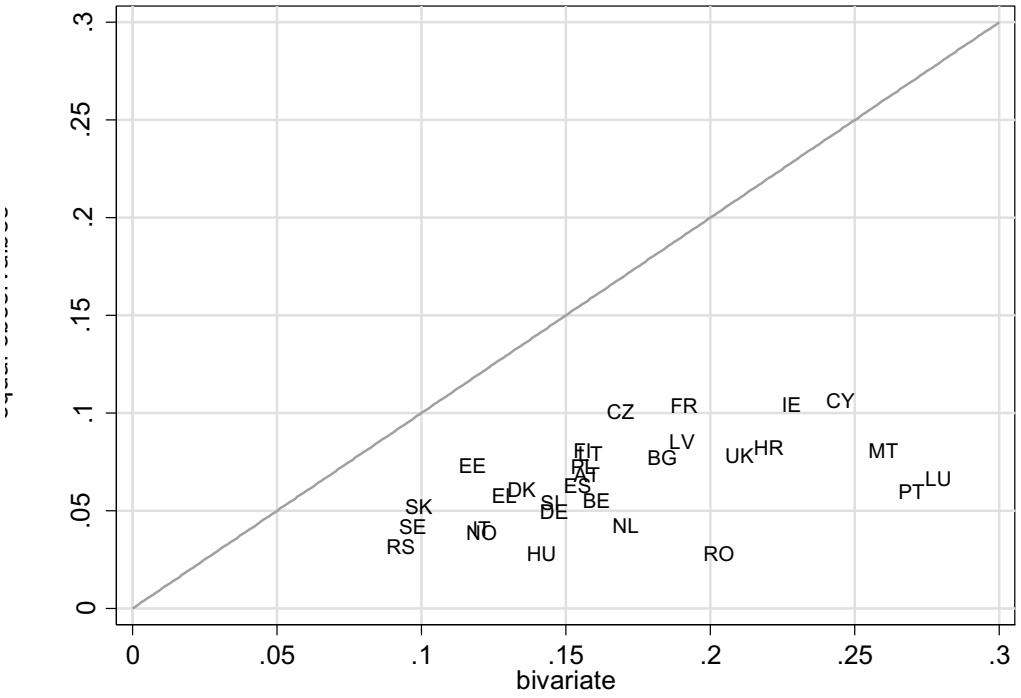


Note: Countries ordered from low to high between class inequality, after controlling for background characteristics.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

What does this imply for the overall relevance of earnings differences between social classes for the overall level of earnings inequality? As the graph below shows, between-class inequality accounts for between 10 and 30 percent of total earnings inequality among the population at work. When controlling for observable characteristics, between-class inequality would account for only between 2 and 11 percent of total earnings inequality. Only in four countries would between-class inequality still account for about 10% of total earnings inequality, including Cyprus, the Czech Republic, France and Ireland. Again, this strong cross-national variation shows the varying relevance of measured social class for understanding earnings-inequality across Europe.

Figure 10. The relative share of between social class inequality in total earnings inequality, before and after controlling for differences in the profile of social classes, EU-SILC 2017



Note: 45° line shown.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

DISCUSSION AND CONCLUSION

In this paper we have investigated the relationship between social class and earnings across 30 European countries in a consistent fashion using micro-data from EU-SILC 2017, exploring the variation in between-class eaenings differences and which observable differences between classes contribute to understanding those earnings differences.

Like Le Grand and Tåhlin's (2013) study of 11 countries based on the 2004 European Social Survey), we find a significant link between social class and average earnings, especially with regard to the upper class versus the working class. That class gradient remains when controlling for observable factors, although it is considerably reduced. We also find marked variation between countries in the relation between social class and earnings. For instance, average earnings of the upper class are about 1.4 times higher than those of the working class in Slovakia, and up to 2.5 times higher in Ireland. This cross-national variation is considerably reduced in a counterfactual scenario where the composition of social classes and returns to education and other characteristics would be the same across classes. However, even then the earnings ratio varies between 1.1 in Hungary and 1.6 in Bulgaria. Few papers have looked into earnings differences between the working class and intermediate class. It is interesting to see that, in contrast to Le Grand and Tåhlin (2013), we find in some countries that the intermediate class has lower earnings than the working class. When we control for compositional effects and differences in returns to individual and household characteristics, this is the case for 7 out of 30 countries. This implies a strong variation in the the class gradient of earnings across countries.

Furthermore, the observable individual and household factors that help to understand the bivariate relation between class and yearly earnings, vary considerably across countries. We made a distinction between compositional effects and differences in returns to individual and household characteristics. The results suggest that different mechanisms are at play in generating average earnings differences between the upper class and working class, as compared to the intermediate class and working class. Broadly speaking, differences in educational profiles and number of hours worked in the year account for a considerable share of the gap in average earnings between the working and upper class. This is in accordance with the literature that puts

human capital at the forefront of the contrast between those classes (Goldthorpe, 2007; Tåhlin, 2007; Wright, 1997). In some countries, though, differences in employment characteristics (such as the sector of economic activity, the share of temporary contracts and potential career length) are at least as important. In contrast, the differences in educational profile seem to be much less relevant for understanding the earnings ratio of the intermediate class and the working class, with very few exceptions. Also, returns to individual and household characteristics and differences in employment profiles seem to play a more important role for understanding the intermediate vs. working class earnings ratio.

We also investigated overall between-class inequality and its share in total earnings inequality. Even though we observe a stark difference in average earnings of the upper class versus the working class in all countries, between class inequality accounts for between 10 and 30 percent of total earnings inequality. This share drops to between 2 and 11 percent when we control for observable factors, implying that observable factors can account for a very large share of overall earnings inequality between social classes.

In sum, social class seems to have an important analytical value across Europe for understanding earnings inequality, especially when considering upper class and working class earnings differences. At the same time, the results reveal striking differences across countries in the degree of the class gradient and the relative importance of factors that help to explain bivariate patterns of earnings inequality between social classes. Together with the strong variation in the size and composition of social classes, this implies that some caution is required when social class is used as a shortcut for measuring command over economic resources in comparative research. Furthermore, some of our results may give some ammunition to those who have announced the 'death of social class', especially with regard to our counterfactual

measure of overall between-class inequality, and the difference in average earnings between the working class and intermediate class. At the same time, though, it is clear that even in that case there are a number of countries where between-class inequality remains a noticeable feature of overall earnings inequality, which is hard to ignore. Furthermore, as argued by Rose and colleagues (2010), even if class effect is mediated by other variables, it is still relevant to know that class brings the relevant characteristics together and helps understand economic inequalities.

The strong cross-national variation that we observe begs for further elaborations of class theory given the current blind spot in these theories regarding the conditions under which to expect weaker or stronger class differences in earnings. Exploring further the role of politics and institutions is of particular interest (cf. Brady *et al.*, 2016). Earnings outcomes are constrained by the institutional context from existing policies, rules and regulations. Moreover, earnings also reflect the outcome of power relations and class-based collective action. Theories and empirical research that would like to develop this further should not only focus on how to explain the 'remaining' differences in earnings after controlling for observable factors, but also on why it is the case that compositional effects play a more important role in one country as compared to another, given that part of the compostion of social classes can be driven by policies.

REFERENCES

Akerlof, G.A. (1984), 'Gift Exchange and Efficiency-Wage Theory: Four Views', *The American Economic Review*, 74: 2, 79-83.

Albertini, M. (2013), 'The relation between social class and economic inequality: A strengthening or weakening nexus? Evidence from the last three decades of inequality in Italy', *Research in Social Stratification and Mobility*, 33, 27-39.

Atkinson, A.B., Guio, A.-C. and Marlier, E. (eds.) (2017), *Monitoring social inclusion in Europe*, Luxembourg: Publications Office of the European Union.

Bedük, S. (2018), 'Understanding Material Deprivation for 25 EU Countries: Risk and Level Perspectives, and Distinctiveness of Zeros', *European Sociological Review*, 34: 2, 121-137.

Bihagen, E., Nermo, M. and Erikson, R. (2010), 'Social class and employment relations: comparisons between the ESeC and EGP class schemas using European data', in D. Rose and E. Harrison (eds.), *Social Class in Europe: An Introduction to the European Socio-Economic Classification*, London: Routledge.

Blinder, A.S. (1973), 'Wage Discrimination: Reduced Form and Structural Estimates', *The Journal of Human Resources*, 8: 4, 436-455.

Brady, D., Blome, A. and Kleider, H. (2016), 'How Politics and Institutions Shape Poverty and Inequality', in D. Brady and L. M. Burton (eds.), *The Oxford Handbook of the Social Science of Poverty*, Oxford: Oxford University Press.

Brooks, C. and Svallfors, S. (2010), 'Why does class matter? Policy attitudes, mechanisms, and the case of the Nordic countries', *Research in Social Stratification and Mobility*, 28: 2, 199-213.

Bukodi, E. and Goldthorpe, J.H. (2019), *Social Mobility and Education in Britain: Research, Politics and Policy*, Cambridge: Cambridge University Press.

Clark, T.N. and Lipset, S.M. (1991), 'Are Social Classes Dying?', *International Sociology*, 6: 4, 397-410.

Erikson, R. and Goldthorpe, J.H. (1992), *The Constant Flux: A Study of Class Mobility in Industrial Societies*, Oxford: Clarendon Press.

Evans, G. (ed.) (1999), *The End of Class Politics: Class Voting in Comparative Context*, Oxford: Oxford University Press.

Goedemé, T. (2013), 'How much confidence can we have in EU-SILC? Complex sample designs and the standard error of the Europe 2020 poverty indicators', *Social Indicators Research*, 110: 1, 89-110.

Goedemé, T. (2019), *A note on the replication of the European Socio-economic Classification (ESeC) in the EU Statistics on Income and Living Conditions (EU-SILC)*, Oxford: Institute for New Economic Thinking at the Oxford Martin School, University of Oxford.

Goldthorpe, J.H. and McKnight, A. (2006), 'The economic basis of social class', in S. L. Morgan, D. B. Grusky and G. S. Fields (eds.), *Mobility and Inequality*, Stanford: Stanford University Press.

Goldthorpe, J.H. (2007), *On Sociology, Second Edition*, Stanford: Stanford University Press.

Kim, C., Tamborini, C.R. and Sakamoto, A. (2018), 'The Sources of Life Chances: Does Education, Class Category, Occupation, or Short-Term Earnings Predict 20-Year Long-Term Earnings?', *Sociological Science*, 5: 9, 206-233.

Kunst, A.E. and Roskam, A.-J. (2010), 'Using the ESeC to describe socio-economic inequalities in health in Europe', in D. Rose and E. Harrison (eds.), *Social Class in Europe: An Introduction to the European Socio-Economic Classification*, London: Routledge.

Lahtinen, H., Sirniö, O. and Martikainen, P. (2018), 'Social class and the risk of unemployment: Trends, gender differences and the contribution of education', *Acta Sociologica.*

Le Grand, C. and Tåhlin, M. (2013), 'Class, Occupation, Wages, and Skills: The Iron Law of Labor Market Inequality', in E. G. Birkelund (ed.), *Class and Stratification Analysis*, Bingley: Emerald.

Lipps, O. and Oesch, D. (2018), 'The working class left behind? The class gap in life satisfaction in Germany and Switzerland over the last decades', *European Societies*, 20: 4, 549-571.

Lucchini, M. and Schizzerotto, A. (2010), 'Unemployment Risk in Four European Countries: A Validation Study of the ESeC', in D. Rose and E. Harrison (eds.), *Social Class in Europe: An Introduction to the European Socio-Economic Classification*, London: Routledge.

Oaxaca, R. (1973), 'Male-Female Wage Differentials in Urban Labor Markets', *International Economic Review*, 14: 3, 693-709.

Richards, L. and Paskov, M. (2016), 'Social class, employment status and inequality in psychological well-being in the UK: Cross-sectional and fixed effects analyses over two decades', *Social Science & Medicine*, 167, 45-53.

Rose, D. and Harrison, E. (2010), *Social Class in Europe: An Introduction to the European Socio-Economic Classification*, London: Routledge.

Rose, D., Harrison, E. and Pevalin, D. (2010), 'The European socio-economic classification: A prolegomenon', in D. Rose and E. Harrison (eds.), *Social Class in Europe: An Introduction to the European Socio-Economic Classification*, London: Routledge.

Tåhlin, M. (2007), 'Class Clues', *European Sociological Review*, 23: 5, 557-572.

Tilly, C. (1998), *Durable inequality*, Berkeley: University of California Press.

Tomaskovic-Devey, D. and Avent-Holt, D. (2019), *Relational inequalities: An organizational approach*, Oxford: Oxford University Press.

Watson, D., Whelan, C.T. and Maître, B. (2010), 'Class and Poverty: Cross-Sectional and Dynamic Analysis of Income Poverty and Lifestyle Deprivation', in D. Rose and E. Harrison (eds.), *Social Class in Europe: An Introduction to the European Socio-Economic Classification*, London: Routledge.

Weeden, K.A. (2002), 'Why Do Some Occupations Pay More than Others? Social Closure and Earnings Inequality in the United States', *American Journal of Sociology*, 108: 1, 55-101.

Whelan, C.T. and Maître, B. (2007), 'Levels and Patterns of Material Deprivation in Ireland: After the 'Celtic Tiger'', *European Sociological Review*, 23: 2, 139-154.

Whelan, C.T. and Maître, B. (2010), 'Welfare regime and social class variation in poverty and economic vulnerability in Europe: an analysis of EU-SILC', *Journal of European Social Policy*, 20: 4, 316-332.

Williams, M. (2013), 'Occupations and British Wage Inequality, 1970s–2000s', *European Sociological Review*, 29: 4, 841-857.

Williams, M. (2017), 'Occupational Stratification in Contemporary Britain: Occupational Class and the Wage Structure in the Wake of the Great Recession', *Sociology*, 51: 6, 1299-1317.

Wodtke, G.T. (2016), 'Social Class and Income Inequality in the United States: Ownership, Authority, and Personal Income Distribution from 1980 to 2010', *American Journal of Sociology*, 121: 5, 1375-1415.

Wodtke, G.T. (2017), 'Social Relations, Technical Divisions, and Class Stratification in the United States: An Empirical Test of the Death and Decomposition of Class Hypotheses', *Social Forces*, 95: 4, 1479-1508.

Wright, E.O. (1997), *Class counts: Comparative studies in class analysis*, Cambridge: Cambridge University Press.

Zardo Trindade, L. and Goedemé, T. (2020), *The comparability of the EU-SILC income variables: review and recommendations*, *Statistical Working Papers Series, 2020 Edition*, Luxembourg: Eurostat.

Zhou, X. and Wodtke, G.T. (2019), 'Income Stratification among Occupational Classes in the United States', *Social Forces*, 97: 3, 945-972.

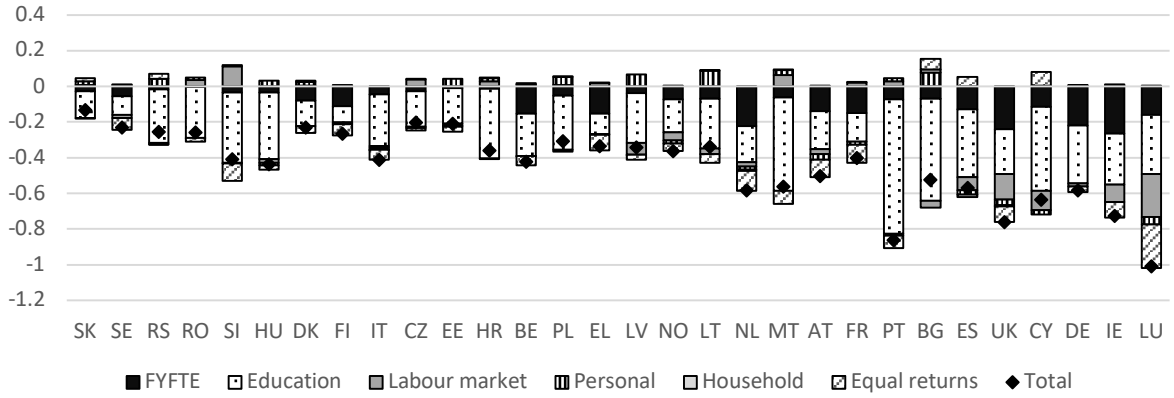
APPENDIX

Table A1. R-squared and degrees of freedom, regressing (the log of) earnings on social class and additional covariates, including and excluding the interaction of each covariate and social class

	log of earnings		earnings		
	full model	no interaction effects	full model	no interaction effects	Degrees of freedom
AT	0.48	0.47	0.39	0.36	6058
BE	0.51	0.48	0.45	0.40	271
BG	0.38	0.37	0.23	0.19	7349
CY	0.76	0.74	0.53	0.47	4310
CZ	0.50	0.48	0.34	0.32	1762
DE	0.65	0.64	0.45	0.42	13495
DK	0.54	0.50	0.36	0.33	5906
EE	0.31	0.29	0.33	0.31	6154
EL	0.50	0.48	0.27	0.24	3177
ES	0.41	0.40	0.36	0.33	2198
FI	0.48	0.46	0.38	0.35	10209
FR	0.48	0.45	0.35	0.29	772
HR	0.46	0.41	0.37	0.30	2406
HU	0.23	0.21	0.34	0.31	4042
IE	0.57	0.55	0.36	0.33	628
IT	0.36	0.35	0.28	0.25	8091
LT	0.37	0.34	0.30	0.25	4943
LU	0.59	0.57	0.43	0.39	3971
LV	0.46	0.44	0.37	0.34	1142
MT	0.55	0.53	0.40	0.35	3901
NL	0.58	0.57	0.43	0.40	13327
NO	0.45	0.43	0.38	0.36	6272
PL	0.43	0.41	0.31	0.28	13056
PT	0.54	0.51	0.35	0.30	4715
RO	0.66	0.61	0.49	0.45	946
RS	0.44	0.41	0.25	0.22	562
SE	0.41	0.38	0.36	0.32	5927
SI	0.44	0.39	0.40	0.34	2854
SK	0.38	0.36	0.25	0.23	5601
UK	0.47	0.45	0.29	0.26	682

Source: computation by the authors on EU-SILC 2017.

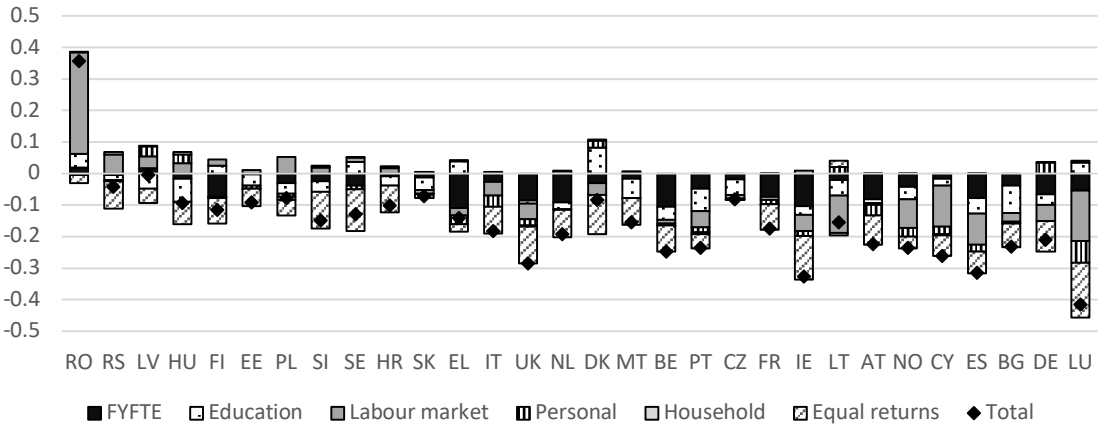
Figure 11. Absolute change in the ratio of average earnings of the upper class and working class when cumulatively equalising the average population composition and returns to covariates, when regressing earnings (rather than the log of earnings) on social class and other covariates, EU-SILC 2017



Note: Countries ordered from low to high ratio, before controlling for background characteristics (similar order as in Figure 7). FYFTE = full-year, full-time equivalent hours.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.

Figure 12. Absolute change in the ratio of average earnings of the intermediate class and working class when cumulatively equalising the average population composition and returns to covariates, when regressing earnings (rather than the log of earnings) on social class and other covariates, EU-SILC 2017



Note: Countries ordered from low to high ratio, before controlling for background characteristics (similar order as in Figure 7). FYFTE = full-year, full-time equivalent hours.

Source: EU-SILC 2017 (release Spring 2019), computations by the authors.