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ABSTRACT

In this paper, we seek to contribute to ongoing discussions of the relationship between income and class in analyses of social inequality and mobility. We argue that while class has sometimes been taken as a proxy for long-term earnings levels, it is of greater importance, at least when treated in terms of the EGP schema or the European Socio-Economic Classification (ESEC), in capturing differences in age-earnings trajectories. Moving beyond previous single country studies, we examine how far the theory that underlies ESEC is reflected in men's age-earnings trajectories across 14 European countries, while also taking into account any effects of their educational qualifications. Modelling data from the 2017 EU-SILC survey, and focussing on men's full year/full-time equivalent gross annual earnings, we find that although the age-earnings trajectories that are estimated for different classes do reveal some cross-national variation, there are major features, of a theoretically expected kind, that are evident in our pooled sample and that regularly recur in individual countries. Class differences in earnings are at their narrowest for men in the youngest age group that we distinguish but then widen across older age groups. This occurs primarily because the earnings of men in the professional and managerial salariat, and especially in the higher salariat, show a marked rise with age, while the earnings of men in other classes rise far less sharply or remain flat. We also find evidence that these diverging trajectories are primarily shaped by individuals' class positions independently of their level of educational qualification – however important the latter in determining the class positions that they hold. What can be regarded as the logic of different forms of employment relations lead to a large degree of cross-national commonality in the association that exists between class and earnings at different ages.

1. Introduction

Of late, a number of exchanges have occurred between sociologists and economists on the relative merits of analysing social inequality and social mobility in terms of class, as generally favoured by the former, or of income, as generally favoured by the latter. Some differences of view on this issue are now also emerging among sociologists themselves. In seeking to contribute to the discussion that has arisen, we start out from two recent papers: that of Kim, Tamborini and Sakamoto (subsequently KTS) (2018) and that of Yaish and Kraus (subsequently YK) (2020).

KTS's work would appear to rest on an unwarranted assumption.

That is, that in analysing social inequality and social mobility, sociologists are attracted to social class primarily because they believe that it provides *a good proxy for* long-term earnings (2018: 206–8). It is true, as KTS document, that sociologists have at times suggested that class might serve as a proxy in this way, and it is therefore entirely appropriate that KTS should investigate, as they do, how far it serves well. But they are very wide of the mark in supposing that this is the main reason for sociologists' interest in class. What sociologists who favour class analysis have more generally maintained is that class position is a good indicator of, what KTS at one point (2018: 208) refer to, as 'long-term socioeconomic standing', but which sociologists would take as encompassing

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significantly more than level of earnings.[1]

Where, as with the EGP class schema (Erikson et al., 1979), to which KTS chiefly refer, class positions are derived from social relations in labour markets and workplaces, what is seen as captured – and now with substantial supporting evidence – is not only level of earnings but, further, security of earnings, stability of earnings and earnings prospects (Bukodi and Goldthorpe, 2019: ch. 1). Interest is not limited to how much individuals earn and to inequalities in this regard but extends to the form of employment relations within which individuals make their earnings and to the further inequalities that in this way arise.

The foregoing is well understood by YK. Largely in response to KTS, they directly pose the question (2020: 2) of whether class does 'capture more than simply the overall level of earnings' and focus on long-term earnings. However, they are then concerned not with earnings simply as summed over some period – 20 years in the case of KTS – but rather with the trajectories that employees' earnings describe over the course of their working lives and thus with their earnings prospects at different ages. Following the logic of the EGP class schema (see Goldthorpe, 2007, vol. 2: ch. 5; McGovern et al., 2007: ch. 3), they would expect the shape of these trajectories to vary with class position and, specifically, with the form of employment relations in which individuals are involved (for earlier research, see Goldthorpe & McKnight, 2006; Bukodi and Goldthorpe, 2019: ch. 1).[2]

Where problems of work monitoring and human asset specificity are low, as with workers in low skill, routine jobs, employers can resort to what may be called a basic labour contract – something close to a spot contract for labour – under which, through piece- or time-rate systems, pay is exchanged for discrete amounts of work done, and on what need be only a short-term basis. In this case, there is then no expectation that earnings will increase over working life – other than as a result of general economic growth – except perhaps during a short initial period in which such skills and experience as are called for are built up. In contrast, where problems of work monitoring and human asset specificity are high, as with managerial and professional employees, exercising delegated authority and specialised expertise, a different form of contract is required: in particular, in order to deal with principal-agent problems and the danger of losing employees not readily replaceable from an existing labour pool. A form of contract is thus favoured involving a 'service relationship', in which employees' long-term

commitment to organisational goals is sought through 'compensation' in the form of a salary, usually on an incremental scale, together with clear possibilities for career advancement. In this case, earnings would then be expected to rise steadily over working life up to a relatively late stage. Lazear (1995) refers in this connection to 'deferred payment' contracts, which entail employees being paid less than their productivity warrants when they are young but more as they get older. The contract thus discourages 'hasty quits', strengthens the threat of dismissal, and gives an incentive to employees to stay with their organisations up to the point at which their compensation will reach peak value.

On the basis of a longitudinal and intergenerational Israeli dataset, including information on class position and long-term earnings, YK are able to show that their theoretical expectations are largely met. From growth curve analyses, distinctive earnings trajectories linked to class do emerge (2020: Fig. 3). One is for manual workers in the low skill, routine jobs of EGP Classes IIIb and VIIa, in which, after a slight initial rise, earnings remain essentially flat from around age 35 onwards. A second is for the managerial and professional employees of EGP Classes I and II, in which earnings rise steadily from entry into work up to around age 50, if not beyond. And a third is a trajectory of intermediate shape for employees in lower non-manual, supervisory and technical grades and skilled manual workers, as covered by EGP Classes IIIa, V and VI, whose employment contracts tend to involve some compromise between the logics of the basic labour contract and the service relationship.

YK thus conclude that analyses based on individuals' class – for which data are far more readily available than on their long-term earnings – can give a good, and a theoretically informed indication of how their level of earnings is likely to evolve over time. And in turn in mobility studies, class analyses are an effective means of showing, in this as in other respects such as earnings security and stability, the extent to which, to return to KTS's phrase, 'long-term socioeconomic standing', over and above inequalities in current income levels, is intergenerationally transmitted.

In the present paper, we seek to build on YK's work in examining how far the theory that underlies the EGP class schema or, more precisely, a direct successor, the European Socio-Economic Classification (ESEC) (Rose & Harrison, 2010), is likewise reflected in evidence on earnings trajectories, but with three further considerations in mind.

First, it is important for our purposes to distinguish between (i) the earnings trajectories of individuals over their working lives, in the course of which their class positions may change and (ii) the earnings trajectories of collectivities of individuals holding the *same* class positions across successive age-groups. So far as (i) is concerned, no systematic analyses have in fact, to the best of our knowledge, so far been carried out – probably because of the extensive yet detailed data on both individuals' earnings and class histories that would be required. It is in this connection to be noted that while YK analyse the earnings trajectories of individuals, they do not consider the effects on these trajectories of changes in their class positions. The class positions of the individuals in the birth cohort they study are fixed as those they held at the 1995 Israeli census when aged 35–44.

Our focus here is on (ii) – or what we will refer to as class age-earnings trajectories. It is this focus that we would regard as being most relevant to our concerns. The theoretical position previously set out can be most appropriately tested by seeing if expected differences are revealed in earnings trajectories across age-groups of individuals holding similar class positions – i.e. involved in similar forms of employment relations. It is these relations that we take to be crucial for earnings trajectories, regardless of whether particular individuals were previously in different class positions to their present ones. Thus, insofar as worklife class mobility does occur and has important effects on individuals' earnings trajectories, this should count *against* our theoretical position being supported – i.e. reduce the likelihood of trajectories of the expected kind emerging. There are in fact rather strong empirical grounds for supposing that such effects will be quite limited except during early working life. It has become widely accepted in research on

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[1] This same assumption that studying class is in effect an inferior substitute for studying earnings would also seem to underlie the critique of Sakamoto and Wang (2020) of class analyses of social mobility. This is not the place for a counter-critique of their paper. We would only note that their claim (2020: 1) that such analyses are 'disappearing' is clearly mistaken, as indicated inter alia by the recent publication of two major collections of work of this kind (Breen & Müller, 2020; Salido & Fachelli, 2021). KTS make the further claim that long-term or lifetime earnings are of 'critical importance' (2018: 211) in determining a whole range of life chances, extending not only to economic outcomes, such as the accumulation of wealth or pensions rights but also to life expectancy, marital stability, overall life satisfaction and feelings of self-worth (2018: 206). They cite evidence that long-term earnings are a factor in these latter regards but they do not cite, and we are not aware of, any evidence that would indicate that their effect is in any sense 'critical' – as, say, in dominating that of all other factors involved. The relative importance of different forms of social inequality in relation to different outcomes remains a matter of ongoing enquiry. In research into children's educational attainment (Bukodi, Goldthorpe and Zhao, 2021), it has been found that parental income is of generally less importance than parental class and that in certain respects – notably educational choice given previous performance – parental education and social status are more important than parental class, and that with these other factors included in the analysis, income becomes in fact inconsequential.

[2] YK's work thus has a different focus from that of other recent research on the relation between class and earnings which is concerned with earnings inequality between classes, with whether or not this is widening over time, and with its contribution to earnings inequality overall. See, e.g., Albertini et al. (2020), Goedemé et al. (2021).

class mobility that around the mid-thirties individuals tend to reach a stage of 'occupational maturity' beyond which the chances fall away of any further occupational mobility also entailing class mobility.[3]

Second, it would seem desirable that analyses of the kind we favour should be extended cross-nationally. Esping-Andersen has complained (1993: 2, 8) that class theory tends to assume that 'classes emerge out of unfettered exchange relations, be it in the market or at the "point of production"' and is thus 'nested in an institutionally "naked" world.' We would ourselves see advantage in theory that thus aspires to a high level of generality. Nonetheless, the question evidently arises of how far the theory we are concerned with, which focuses specifically on exchange relations in both the market and at the point of production, does hold good – as we would wish to suppose – across different institutional contexts. Analysing the association between class and age-earnings trajectories cross-nationally is the obvious way to proceed and we treat this association across a range of western European countries.

Third, it would further seem desirable to bring education into our analyses. From the standpoint of human capital theory (Becker & Tomes, 1979; Mincer, 1970), human capital in the form of educational attainment reflects both individuals' actual *and potential* productivity. It might therefore be expected that the greater individuals' human capital investment in education, the higher the probability that their earnings will rise over the course of their working lives as their productive potential becomes more fully realised. And it could in turn be held that demonstrated differences in age-earnings trajectories will primarily reflect employees' educational levels rather than the forms of employment contract under which they work. What needs therefore to be investigated is how far class differences in age-earnings trajectories still show up when individuals' educational qualifications are taken into account.

2. Data and variables

Our analyses are based on the 2017 European Union Statistics on Income and Living Conditions (EU-SILC) survey. From this source, we can obtain data on the earnings of individuals over a twelve month 'income reference period', and on their economic status, occupation, education and various other socio-demographic characteristics. The income reference period is defined as the calendar year before interview in all national cases except that of Ireland, where it refers to the twelve months directly preceding interview.[4]

The EU-SILC earnings data relate to individuals at all levels of labour market activity, whereas we wish, as an initial test of our theoretical expectations on the association between class position and age-earnings trajectories, to focus on earnings *as they would be* from full-time and continuous employment. As earlier indicated, we would also expect – and believe it to be the case – that an association exists between class position and the degree of security and continuity of employment. But we see it as important to have the possibility of showing that the results we obtain on age-earnings trajectories are independent of any effects on these trajectories that might result from this further association.

In this regard, a problem then arises with part-time workers in that the EU-SILC survey does not provide information on the number of hours that they were working over the whole of the income reference period – only the number at time of interview. In the case of men, we circumvent

this problem by taking as our target population those men aged 21–64 who had at no point in the income reference period worked part-time but who in this period had been employed full-time for at least one month. With those who were, for any reason, out of employment during this period, while otherwise working full-time, we adjust their earnings accordingly in order to preserve, so to speak, 'the rate for the job'. Thus, if a man worked for only six months out of the twelve, his reported earnings are multiplied by 2. However, in the case of women, no comparable solution exists. Disregarding those who had worked part-time during the income reference period would of course amount to a far more serious omission than in the case of men.[5] And, further, given the limited information on hours worked, we have no reliable basis for adjusting the earnings of women part-timers to get 'the rate for job', in the same way as we do with men who have gaps in their full-time employment. The findings YK report for Israel do not in fact show any marked differences by gender in the association between class and individual earnings trajectories, nor do those on class age-earnings trajectories reported for Britain (Goldthorpe & McKnight, 2006; Bukodi and Goldthorpe, 2019: ch. 1) or for Sweden (Bihagen, 2008). However, in cross-national perspective, the wide variation that exists in the numbers of women who work part-time and in the degree of their employment intensity has to be recognised, and we are not in their case able to achieve comparability in earnings data of the kind that would allow us adequately to pursue our primary research question: that of whether the association between class position and age-earnings trajectories shows a cross-national commonality. We have, therefore, to exclude women from our analyses and have in turn to re-emphasise that what we attempt here is very much a first step. Even if our theoretical expectations of such a commonality are confirmed with the earnings of men working full-time, the question remains open of whether they also hold with women or indeed with workers more generally who are not employed on a full-time and continuous basis.

Finally, we have to note that there has been much discussion of the quality of EU-SILC data and, in particular, of the extent to which cross-national comparability has been achieved, given that comparative findings do not result from 'harmonised' interview schedules but in general from 'guided output-harmonisation' (see e.g. Verma, 2006; Iacovou et al., 2012).[6] We limit our attention to Western European countries since in the case of the former state socialist societies of East-Central Europe we do not have detailed information on the ways in which employment relations have evolved in the course of their widely differing transitions to market economies. But, on grounds of data quality, we have also found it necessary to exclude several Western European countries from our analyses, including the UK and Germany. In the case of the UK, data on respondents' educational attainment are missing to a serious extent – around 50%; and in the case of Germany, the construction of social classes – as described below – led to class distributions that were widely out of line with those available from other sources.[7] Our analyses are then based on the following 14 countries: Austria, Belgium, Denmark, Greece, Spain, Finland, France, Ireland,

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[3] This being so, we would not expect worklife class mobility to have greatly affected YK's results, given that they relate to a cohort aged 35–44 at the time when data on their earnings were first obtained.

[4] We had initially envisaged pooling data across several years of the EU-SILC survey in order to obtain larger Ns but this proved not to be possible. The survey is based on rotating panels so that some individuals will be present in the data for only one year but others for up to four or more, and the individuals in question cannot be identified under EU data protection rules. With pooling, repeated observations on the same individuals would then arise and could not be eliminated (Iacovou et al., 2012: section 5.2).

[5] And it would thus in too many countries lead to unduly small Ns. Data on differences in 'employment intensity' – more specifically, in the proportion of individuals working full-year and full-time – by gender and class across the 14 countries we consider are shown in Appendix 1.

[6] On the comparability of the EU-SILC income variables specifically, to which most attention would seem to have been given, see Goedemé and Trindade (2020).

[7] For Germany, occupational data are only available on a much more aggregated level than for other countries, resulting in a loss of precision in estimation of the distribution by ESEC. The same applies with Malta, which we therefore also exclude. Cyprus is excluded because we were unable to find independent data on class distributions against which we could check the distribution we derived from EU-SILC data. In general, the problems of comparability that arise would seem more serious with social class construction than with earnings (see further Goedemé & Paskov, 2021).

Italy, Luxembourg, the Netherlands, Norway, Portugal and Sweden.

We leave out of our analyses the self-employed workers and small employers covered by ESEC Class 4, since the issues that we are concerned with relate only to the earnings of employees,[8] and we also leave out all individual cases with missing values on any of the variables we use, as described below. We then have a sample of 43,719 men in total, with national samples ranging in size from a minimum of 1146 for Denmark to a maximum of 7918 for Italy. Appendix 2 gives the analytical sample size for each country and shows in detail how it was arrived at.[9]

EU-SILC surveys involve a complex sampling procedure that, wherever possible, we take into account by applying, alongside the standard weights provided in the dataset, sample design variables on stratification and clustering (Goedemé, 2013).

The dependent variable of our analyses is then full year equivalent gross earnings – in Euros –for men aged 21–64 over the EU-SILC 12-month income reference period. Earnings cover cash and 'near cash' income of various kinds. More specifically, the following are included: wages and salaries, all overtime and bonus payments, allowances for working in remote locations and for transport to and from work, and also all payments made by employers to supplement social insurance schemes where such payments cannot be separately identified as social benefits. Earnings data are top-coded at the 99.9th percentile: i.e. data points in the upper 0.1% of the earnings distribution are replaced by the value at the 99.9th percentile. Appendix 3 shows the median value of our dependent variable for the pooled sample of 14 countries and separately for each individual country. In all of our analyses we work with the natural logarithm of earnings, in order to correct for the positive skew of the distribution. In analyses of the pooled sample of 14 countries, earnings are adjusted according to purchasing power parity, in order to ensure comparability of earnings across countries.[10]

The key explanatory variable of our analyses is social class, which we operationalize through ESEC. Like the EGP schema, ESEC is based on employment relations and is designed specifically for the purposes of international comparisons. To apply ESEC to EU-SILC data, we draw on the procedure developed by GESIS (2016) and further adjusted by Goedemé and Paskov (2021).[11] First, we create variables for respondents' employment status, indicating whether they are employers, self-employed or employees and then, for employees, on whether or not they have some form of supervisory or managerial role in their employment. Second, we code occupational data to a common classification, the 2-digit version of ISCO-08. On this basis, we can then allocate the men in our samples to a 'reduced' seven-category version of ESEC. However, it turns out that in several countries the proportion of men in Class 3 is less than 5% and it is only a little over this figure in our pooled sample. In all of our analyses, we therefore collapse Class 3 and Class 5 to form a single 'intermediate' class between Classes 1 and 2, that can be taken as representing the managerial and professional salariat, and Classes 6 and 7, that can be taken as representing the wage-earning working class. Table 1 shows the distributions by the classes that we thus distinguish for the pooled sample and for each country sample.[12]

Given that we aim to examine the relationship between social class and earnings trajectories by age, our definition of age groups is of importance. We code respondents to four such groups: 21–34, 35–44, 45–54 and 55–64. A finer grouping would have been desirable but would in too many cases have led to unduly small Ns.

As explained in the Introduction, we wish also to bring individuals' education into our analyses. We create a three-fold variable of highest level of educational attainment: no qualifications or no more than lower secondary; upper secondary qualifications; and post-secondary/sub-tertiary or degree-level qualifications.

Finally, in all our statistical modelling we include a number of control variables. Dummies are included for living in marriage or cohabitation, for having at least one child resident in the household, and for being of foreign birth. A variable for the industry of the organisation in which respondents were employed is also included. This distinguishes extractive industry, manufacturing and construction; trade and accommodation; professional services; public services; and other services. [13]

3. Results

We begin by showing in Fig. 1 the observed trajectories of median log gross full-year equivalent annual earnings by class and age-group for our pooled sample, with each country being weighted by the average sample size (N = 3123). These trajectories prove to be on much the same lines as those found by YK in applying the EGP schema to Israeli data on individual earnings trajectories. With men in the youngest age group, class differences in earnings are on expected lines but are relatively narrow. However, these differences steadily widen across older age groups. This comes about, as can be seen, in the following way. For men in Classes 6 and 7, broadly the wage-earning working class, some increase in earnings evident over early working life then tends to fade away; but for men in Class 1 and to a lesser extent in Class 2, the higher and lower levels of the managerial and professional salariat, earnings rise, more sharply, and across all age groups. The trajectory for men in the collapsed intermediate classes, Classes 3 and 5, is itself intermediary.[14]

However, these findings, while of interest in themselves, do of course leave entirely open the questions on which, as indicated in the

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[8] ESEC Class 1 does include some small numbers of those classified as 'large' employers, and ESEC Classes 1 and 2 of those classified as self-employed professionals. However, we retain these individuals in our analyses. In the case of higher-level managers and professionals, remuneration can involve both salary and proceeds from enterprises or partnerships, with official employment status being then primarily influenced by legal and fiscal considerations. See further Goldthorpe (1987).

[9] Certain countries – Denmark, Finland, Netherlands, Norway and Sweden – apply a 'selected respondent' sampling approach. In these countries, most information is taken from official registers and only one person in each household is interviewed (Iacovou et al., 2012). As a result, information needed to construct social class (ESEC) is only available for the 'selected respondent'. In principle, this type of missingness, in occurring by design, deliberately and randomly (Goedemé, 2019), should not systematically bias research results in the way that missingness due to non-response might well do. Hence, observations for non-selected respondents are not included in the analysis of missingness in Appendix 2.

[10] Given our concerns over data quality, we show in Appendix 4 median annual earnings data from the European Structure of Earnings Survey (SES) that refers to enterprises with at least 10 employees operating in all areas of the economy except public administration, alongside a comparable version of median annual earnings derived from our EU-SILC data for each country we consider. A reasonably good correspondence can be seen.

[11] We depart from this procedure only in order to make it possible to include in our samples those individuals who were not in employment at time of interview but who had been in full-time employment for at least one month in the income reference period.

[12] Again as a check on data quality, we compare in Appendix 5 the class distributions we derive from EU-SILC with ones derived from the European Social Survey. In general, a good alignment can be seen, except that our procedure with EU-SILC tends to increase the numbers in Class 1 and, especially, in Class 2, at the expense of those, mainly, in Classes 3 and 5 and Class 7. We would note that insofar as inaccuracies in class allocation do occur, these will tend to work *against* our attempt to reveal cross-national regularities in class-linked age-earnings trajectories.

[13] Distributions of the variables of age, education and controls are shown in Appendix 6.

[14] We recognise that with our cross-sectional data we are not able to separate out age from cohort effects. However, apart from it being unclear how cohort effects would generate the results described, we would note that in the British case essentially the same class-linked age-earnings trajectories have been demonstrated for men in full-time employment in 1975, 1999 and 2014 (Goldthorpe and McKight, 2006; Bukodi and Goldthorpe, 2019: ch. 1).

Table 1
Distribution (%) of men aged 21–64 in full-time employment by the European Socio-Economic Classification (ESEC)[a][b] in pooled sample and in individual countries.

	Class 1: Large employers, higher professionals and managers	*Class 2*: Lower professionals and managers, higher technicians and supervisors	*Classes 3 & 5*: Intermediate occupations[c]; Lower supervisors and lower technicians	*Class 6*: Lower services, sales, clerical and technical occupations	*Class 7*: Routine occupations	Total	N
Pooled sample[d]	19.1	30.0	16.2	20.7	14.1	100.0	43719
Austria	16.0	29.7	26.2	17.9	10.2	100.0	2391
Belgium	19.9	33.3	16.3	17.8	12.7	100.0	2062
Denmark	22.8	29.0	14.7	20.8	12.7	100.0	1146
Finland	23.1	26.4	8.6	25.5	16.5	100.0	1857
France	19.1	31.1	19.6	15.7	14.4	100.0	3991
Greece	16.5	20.9	15.9	28.4	18.3	100.0	5738
Ireland	27.6	17.4	19.3	15.9	19.8	100.0	1604
Italy	11.4	28.9	17.3	25.7	16.8	100.0	7918
Luxembourg	19.3	32.2	16.0	19.3	13.2	100.0	2173
Netherlands	29.9	36.3	13.4	13.2	7.1	100.0	2101
Norway	25.3	36.0	13.0	17.7	8.1	100.0	1582
Portugal	13.9	22.6	16.1	29.8	17.6	100.0	4784
Spain	10.9	22.8	15.8	29.3	21.2	100.0	5096
Sweden	18.4	35.2	10.2	24.2	12.1	100.0	1276

Notes
[a] Employed at least one month in past year
[b] Class 4 - small employers and own account workers - is excluded
[c] Intermediate occupations comprise mainly ancillary professional and administrative employees
[d] Pooled sample: weighted using average sample size (N = 3123) per country
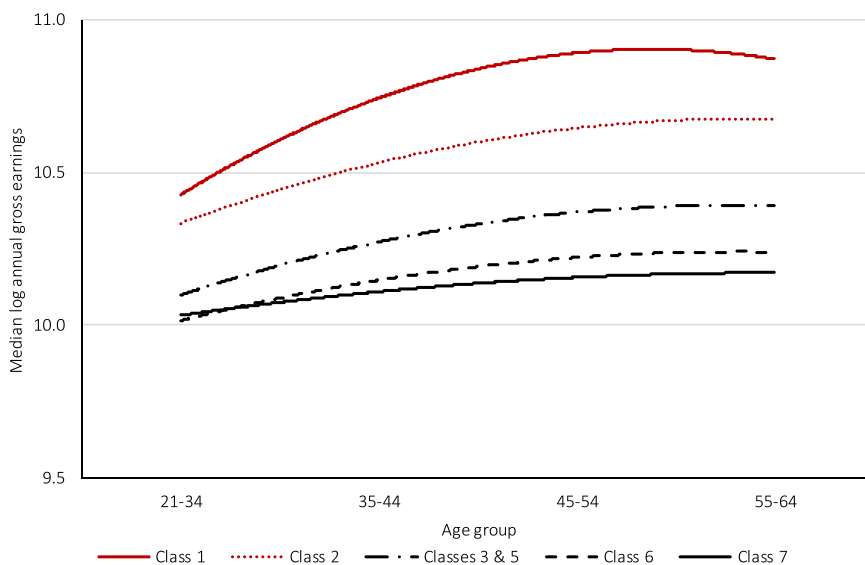

Fig. 1. Observed median log gross full-year equivalent annual earnings across age groups, by social class, for men aged 21–64 in full-time employment - pooled sample[(a)(b)]
Notes
(a) Pooled sample: weighted using average sample size (N = 3123) per countrym
(b) Curves are smoothed using a quadratic function.

Introduction we wish to focus, of the extent to which a cross-national commonality exists in the association between class and age-earnings trajectories and of the possible influence of education, independently of class, in shaping these trajectories.

In order to treat these questions, we need to model the observed data. We fit a quantile median regression model (Koenker & Bassett, 1978) for full-year equivalent gross annual earnings, in which class and age and an interaction between them are the main explanatory variables along with education, and in which the control variables previously described are also included.[15] Fig. 2.1 shows the age-earnings trajectories by social class estimated under this model for the pooled sample, and Fig. 2.2 shows the trajectories for each of our 14 countries separately.

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[15] Selection on individuals' unobservable characteristics may be an issue, as we only observe those who 'select themselves' into employment in different classes. In the absence of longitudinal data, a Heckman two-step selection model is commonly used to correct for any such bias but there are serious challenges in adopting this approach for quantile, including median, regression (Koenker, 2017), and no correction is attempted. However, as regards possible selection effects into employment in different classes, we show in Appendix 7, using our pooled sample, that class differences in the proportions of men working full-year and full-time across the four age groups we distinguish are rather small.
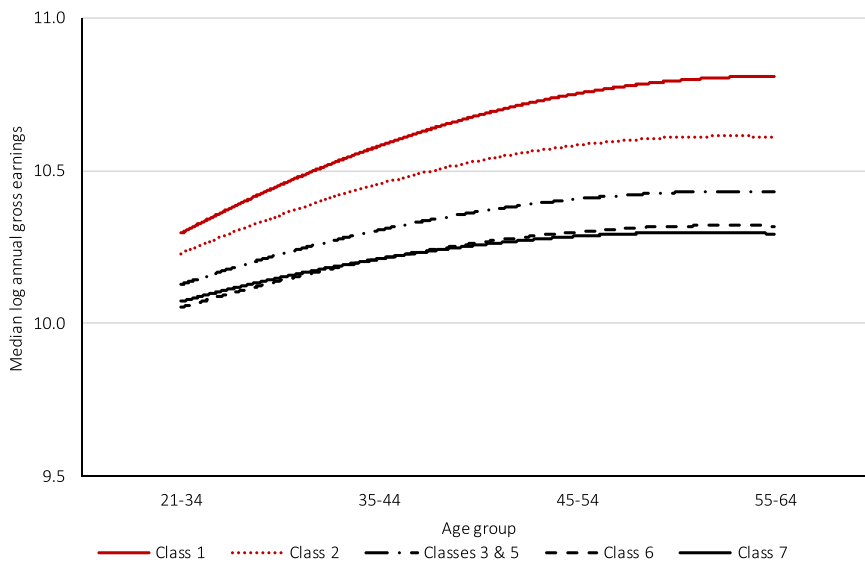
Fig. 2.1. Estimated median log gross full-year equivalent annual earnings across age, groups by social class, for men aged 21–64 in full-time employment - pooled sample[(a)(b)(c)]
Notes
(a) Pooled sample: weighted using average sample size (N = 3123) per country
(b) Model includes the following explanatory variables: social class, age group, interaction between social class and age group, education, living in partnership, having a child aged 0–17 in household, foreign birth, industry and fixed effects for country
(c) Curves are smoothed using a quadratic function

From Fig. 2.1, it may be noted that while class differences in the estimated trajectories are somewhat narrower than with the observed trajectories of Fig. 1 – which might be expected with the introduction of education and other control variables – the curves followed by the trajectories are very similar. That is to say, our model would appear to be, at least in an overall sense, a fairly realistic one.[16]

Turning then to the trajectories for the individual countries as shown in Fig. 2.2, some degree of cross-national variation is apparent. However, on closer inspection, it can be seen that leading features of the trajectories for the pooled sample are still largely replicated across countries. First, class differences in earnings are narrowest for men in the youngest age group while widening across older age groups. Only Luxembourg appears as a clear exception in this regard.[17] Second, the widening across age groups results primarily from the fact that, at least up to the oldest age group, the earnings trajectories for men in Class 1, the higher salariat, show a quite steep upward slope, and such a slope, if less marked, can also be generally seen for men in Class 2, the lower salariat.

The main variations on these features are then limited to the following. First, in a number of countries, the earnings trajectories for men in the salariat tend, though for the most part only very slightly, to turn downwards for the oldest age group. This is evident with Class 1 in Denmark, Ireland, Spain and Sweden, and with Class 2 in Belgium, Denmark, Finland, the Netherlands, Norway and Spain. Second, in several countries – Greece, Ireland, Luxembourg and Spain – the trajectories for men in Classes 6 and 7 also show some continuing rise across the age groups, although a generally weaker one than with Class 1; and this is also the case for Class 6, but not for Class 7, in Norway and Sweden.

In the light of Fig. 2.2, it is then possible to claim that under our model class differences in age-earnings trajectories across Western European countries do display some substantial degree of commonality. And such variation as does show up, as well as being rather slight, is for

the most part variation on well-defined themes that are themselves not seriously inconsistent with the theory and the related conceptualisation of social class that, in the way earlier noted, inform ESEC.

There is, though, one further way in which we can check on how far the results we have so far presented are in line with this theory. With the model underlying Figs. 2.1 and 2.2, the age-earnings trajectories that are estimated reflect the main effects of class, age and education together with the class-age interaction effect that is also included.[18] What is then implied by the differences in employment relations that define classes under ESEC is that with the earnings trajectory of Class 1 – that which chiefly drives widening class differences in earnings with age – and also, if to a lesser extent, with the trajectory of Class 2, the class-age interaction effect should be positive. Specifically, with those individuals in a service relationship, the effect of their class position on their earnings should *increase with age*, at least up to a certain point – or, in Lazear's terms, as the 'deferred payment' element in their employment contract works out. In contrast, insofar as individuals are employed under some approximation to a basic labour contract, involving pay for more or less discrete amounts of work done and with no long-term commitment, no class-age interaction effect should show up.

In Table 2, we show estimates under our model of the interaction effects in question for our pooled sample and separately for each of our 14 countries. The results reported in this table can be summarised as follows.

First, with men in the youngest age group and in Class 7 being taken as reference, for men in Class 1, interaction effects with age in relation to earnings that are significant, positive and increasing in strength are found for the pooled sample and likewise for four individual countries – Belgium, Italy, Portugal and Spain. With four further countries – Austria, Finland, France and Norway – this same pattern shows up except that the coefficient for the next-to-youngest age group, though positive, is not significant. And with another three countries – Denmark, the Netherlands and Sweden – this pattern is again found except that the coefficient for the oldest age group, though positive and significant in the cases of the Netherlands and Sweden, is weaker than that for the next-to-oldest. In other words, for 11 out of our 14 countries, class-age interaction effects on earnings are revealed that are in close

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[16] A reviewer has suggested also including in our model an age-education interaction term which, if this did not then lead to any change in the age-earnings trajectories for different classes, would make our findings more credible. In Appendix 8 we show that in this way very little change is in fact brought about.

[17] Luxembourg is also exceptional in that, as can be seen, the earnings trajectory for Class 7 lies above that for Class 6. Questions of the degree of comparability that it has been possible to achieve in social class construction in general can therefore be raised.

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[18] In Appendices 9 and 10, we report the main effects of class and age under a model in which the class-age interaction effect is not included. These are largely as might be expected, except, perhaps, in that men in Classes 6 and 7 differ rather little in their earnings and that in a few countries the positive effect of age on earnings weakens somewhat in the oldest age group.
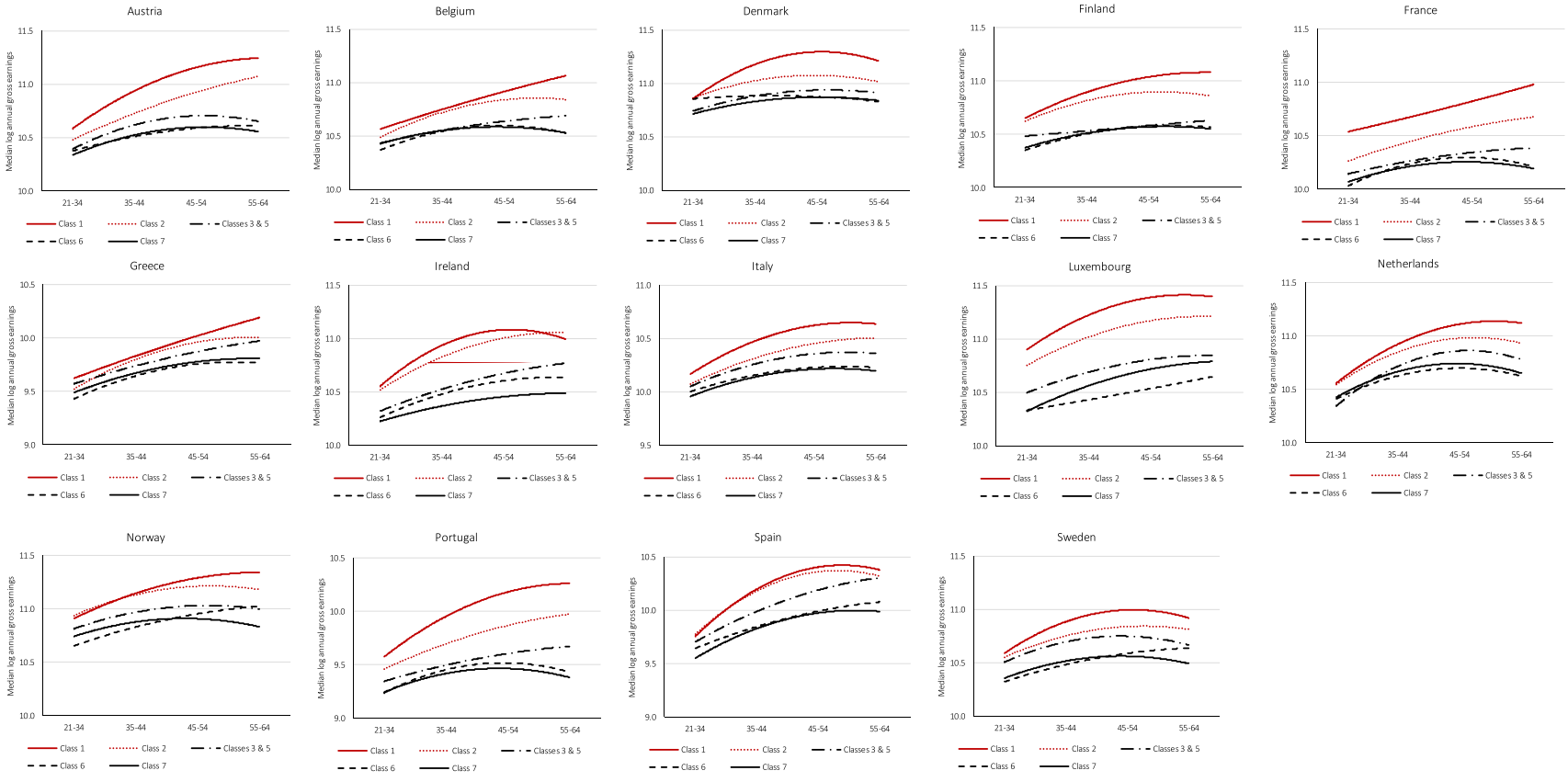
Fig. 2.2. Estimated median log gross full-year equivalent annual earnings across age groups by social class, separately by country - men aged 21–64 in full-time employment[a][b]

Notes

(a) Model includes the following explanatory variables: social class, age group, interaction between social.class and age group, education, living in partnership, having a child aged 0–17 in household, foreign birth, industry

(b) Curves are smoothed using a quadratic function.

Table 2

Interaction effects between social class and age[a] on log full-year equivalent gross annual earnings; men aged 21–64 in full-time employment - median regression coefficients[b].

	Class 1 *age group…			Class 2 *age group…			Class 3 & 5 *age group…			Class 6 *age group…		
	35–44	45–54	55–64	35–44	45–54	55–64	35–44	45–54	55–64	35–44	45–54	55–64
Pooled sample[c]	0.13 * *	0.28 * *	0.30 * *	0.11 * *	0.16 * *	0.20 * *	0.04	0.07 *	0.10 * *	0.03	0.02	0.04
Austria	0.11	0.35 * *	0.48 * *	-0.05	0.18 *	0.35 * *	-0.01	0.03	0.05	-0.12	0.00	0.00
Belgium	0.13 *	0.19 *	0.49 * *	0.17 *	0.21 * *	0.32 * *	0.06	0.05	0.28	0.09	0.05	0.09
Denmark	0.27 *	0.35 *	0.19	0.14	0.16	0.14	0.25	0.04	0.17	-0.06	-0.05	-0.10
Finland	0.06	0.17 *	0.26 * *	0.01	0.13	0.06	-0.15	-0.07	-0.03	0.00	-0.04	0.00
France	0.03	0.17 *	0.37 * *	0.11 *	0.14 * *	0.36 * *	0.00	0.05	0.10	0.08	0.07	0.07
Greece	-0.03	0.05	0.12 *	0.08	0.04	0.09	-0.02	-0.09	0.12	0.06	0.02	0.06
Ireland	0.28 * *	0.14 *	-0.05	0.35 *	0.11	0.24	0.12	-0.01	0.08	0.08	0.00	-0.07
Italy	0.18 * *	0.27 * *	0.45 * *	0.10	0.14 *	0.26 * *	0.09	0.10	0.14	0.00	-0.06	0.02
Luxembourg	0.16 * *	0.03	0.21 *	-0.04	0.05	0.08	0.04	-0.04	-0.02	-0.15	-0.15	-0.08
Netherlands	0.31 * *	0.48 * *	0.42 * *	0.22 *	0.24 * *	0.20 *	0.12	0.17	0.19	-0.02	0.02	0.04
Norway	0.07	0.25 * *	0.33 * *	0.01	0.12	0.17 *	0.04	0.04	0.08	0.00	0.13	0.24
Portugal	0.13 *	0.58 * *	0.65 * *	0.00	0.27 * *	0.35 * *	-0.08	0.06	0.19	-0.01	0.04	0.02
Spain	0.20 *	0.23 *	0.25 *	0.04	0.12	0.05	-0.03	0.12	0.16	-0.07	-0.09	-0.06
Sweden	0.14	0.34 * *	0.26 *	0.15 *	0.25 * *	0.24 * *	0.10	0.07	0.10	-0.02	0.11	0.17

Notes

* * p < 0.01, * p < 0.05

[a] Reference: individuals aged 21–34 in Class 7

[b] Other explanatory variables in the model: education; living in partnership, having a child aged 0–17 in household, foreign birth, industry

[c] Pooled sample: weighted using average sample size (N = 3123) per country. Fixed effects for country are also included in the model.

approximation to what would be theoretically expected. Greece, where increasing interaction effects become significant only with the oldest age group, cannot be regarded as markedly out of line, and it is, again, Luxembourg and now also Ireland that are the only clearly deviant cases.

Second, for men in Class 2, results for the pooled sample are on the same lines as for Class 1, although, as would be expected, the interaction coefficients are less strong and their increase across the age groups less marked. At the same time, though, cross-national variation is somewhat more apparent than with Class 1. The pattern of interaction effects for seven of the 14 countries – Austria, Belgium, France, Italy, the Netherlands, Portugal and Sweden – does follow one or other of the three close variants distinguished in the case of Class 1, and Norway is not greatly different. But for three other countries that also followed one or other of these variants in the case of Class 1 – Denmark, Finland and Spain – no significant class-age interaction effects for Class 2 are apparent. It would then seem that in some number of countries, insofar as the lower-level managers and professionals of Class 2 are involved in a service relationship with their employers, this does not incorporate provision for earnings to rise more quickly than would be generally associated with age.[19] Greece and Luxembourg are likewise deviant in that no significant class-age interaction effects for Class 2 show up while the results for Ireland are again more markedly deviant.[20]

Third, with the remaining classes, positive class-age interaction effects appear in the pooled sample with Classes 3 and 5, if only weakly, but are not significant in any of the countries taken separately, and with Class 6 such effects can be regarded as non-existent. This latter finding is as would be expected, given the supposed prevalence of some approximation to a basic labour contract among the workers covered, while in

the case of men in the two intermediate classes the conclusion has to be that, although the mixed forms of employment relations which define their class positions may provide for a fixed salary and some expectation of long-term security of employment, they need not entail increases in earnings above those attaching simply to seniority (cf. Goldthorpe, 2007: 116–8,) and that will thus be captured in our model by the main age effect.

In sum, the results shown in Table 2 bring out the distinctiveness of the service relationship and especially in its fullest form as found with those in the higher-level managerial and professional positions constituting Class 1. It is not simply the case that these employees tend to earn more than others over the course of their working lives, as might be expected as a result of their superior human capital. In addition, the form of their employment contract gives them the realistic prospect of their earnings following a steadily rising curve up to a relatively late age.[21]

By way of developing this last point, we can examine more directly how far differences arise in the age-earnings trajectories of men who are in the same class positions but who can be taken as having different levels of human capital – that is, in terms of educational attainment. In this regard, it is appropriate to concentrate on men whose employment relations stand in sharpest contrast: that is, those in Class 1 and those in Class 7. This means, however, that because of the limited numbers of men in these classes in countries where the sample size is relatively small, and further because of the very skewed educational distributions within these classes, we are unable to make reliable cross-national comparisons. We have to restrict ourselves to analyses based on our pooled sample (with, as always before, all countries being given equal weight).

We apply to this sample the same model as we have used previously except that we now drop the educational qualifications variable and in estimating class age-earnings trajectories run the model separately for men with different levels of qualification, as follows. In the case of Class 1, we estimate the age-earnings trajectories of men with post-secondary/

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[19] It may in this connection be relevant that, as observed in note 12 above, our construction of Class 2 leads to the proportion of men included being generally larger than with the European Social Survey – and with therefore possibly greater heterogeneity in its composition.

[20] Ireland is also distinctive among the countries we consider in having not only a generally high proportion of men with post-secondary and tertiary educational qualifications but also in showing a very marked rise in this proportion in the 35–44 age group. The fact that with both Class 1 and Class 2 the class-age interaction effect is strongest with men in this age group may then reflect a process of career acceleration or, to revert again to Lazear, a shortening of the period over which the 'deferral' of payment in relation to productivity occurs.

[21] Our concern in this paper is not with the decomposition of earnings inequality, but the results of a simple ANOVA exercise, shown in Appendix 12, may be of interest. As can be seen, in all age-groups except the youngest class accounts for a larger part of the total variation in earnings among men in our pooled sample than does education, and this difference increases across later age-groups.

sub-tertiary and degree-level qualifications and of those with all lower qualifications. In the case of Class 7, we estimate the age-earnings trajectories of men with no or only lower secondary qualifications and of those with all higher qualifications. The results are shown, respectively, in the left- and right-hand panels of Fig. 3.

With Class 1, it can be seen that the trajectory for men with at least post-secondary qualifications lies always above that for men with only secondary qualifications or none – human capital evidently counts. However, both trajectories follow an upward curve and are more or less in parallel, at least up to the oldest age group when some slight widening occurs. With Class 7, it can likewise be concluded that human capital matters in that the age-earnings trajectory for men with at least higher secondary qualifications lies always above that for men with only lower secondary qualifications or none. But, again, the two trajectories run essentially in parallel, rising slightly with the youngest age group but then over the later age groups remaining more or less flat.

What is therefore rather clearly indicated is that the shape, as opposed to the level, of employees' age-earnings trajectories is primarily influenced not by their human capital, at least as represented by educational qualifications, but rather by the form of their employment relations. Consistently with the theory that informs ESEC, employees involved in a service relationship in its fullest form will, through the logic of this relationship, tend to benefit from increasing earnings over the greater part of their working lives, while employees involved in some close approximation to a basic labour contract will not, given its logic, experience such an increase – and, in both cases, regardless of their level of qualification. Educational attainment is of course a major factor in determining in which class positions individuals find employment; but it is the employment relations that define these positions that then take over in shaping the age-related trajectories that their earnings can be expected to follow.

4. Conclusions

In this paper our aim has been to contribute to ongoing discussion concerning the use of measures of social class, rather than of income or earnings, in analyses of social inequality and mobility. We pursue the argument that while in such analyses class may be taken as a proxy for long-term earnings, in the sense of earnings as summed over a period of years, it is of greater importance in enabling differences to be brought out in the trajectories that earnings tend to follow by age. Where class is treated on the basis of the EGP schema or likewise of ESEC, individuals' class positions are taken to be determined by the employment relations

in which they are involved. And it is differences in these relations that can then be seen as the source of differences in age-earnings trajectories associated with class – just as they can be shown to be also the source of class differences in the security and stability of earnings. Insofar as problems of work monitoring and human asset specificity arise for employers, different forms of relations with employees are called for, ranging from approximations to spot contracts for labour to what has become known as a service relationship, expressed in contracts that aim to link employees' economic futures to their commitment to organisational goals. With the former, a largely flat age-earnings trajectory is to be expected; with the latter, a trajectory that rises steadily at least to a relatively late age.

Previous research has tested the theoretical arguments here involved in particular national cases. We move on to a cross-national approach so as to examine how far a cross-national commonality in class differences in age-earnings trajectories could be said to exist. And we also seek to take account of any effects on such trajectories that may follow from individuals' human capital, in the form of their educational qualifications, independently of their class positions.

We model data from EU-SILC sample surveys in 14 Western European countries, focussing on the full year/full-time equivalent gross annual earnings of men. We distinguish what can be thought of as the higher and lower levels of the managerial and professional salariat, ESEC Classes 1 and 2; the higher and lower levels of the wage-earning working class, ESEC Classes 6 and 7; and an intermediate class comprising ESEC Classes 3 and 5. And we also include in our model a three-level variable of educational qualifications.

What we find is that the age-earnings trajectories estimated for men in different classes have major features, of a theoretically expected kind, that are evident with our pooled sample and that regularly recur in the individual countries that we cover. Class differences in earnings are almost always at their narrowest for men in the youngest age group that we define but then widen across older age groups. And this occurs primarily because the earnings of men in Class 1, and to lesser extent of those in Class 2 rise steadily with age while the earnings of men in other classes rise less sharply or remain flat. Some national variations do show up but except in one or two cases – where data problems may arise – these variations are relatively minor and would, moreover, appear to be nation-specific rather than related in any systematic way to cross-national differences in, say, level of economic development, degree of economic inequality or institutional structure.

We can, moreover, provide further confirmation that our results are in line with what is implied by the theoretical basis of ESEC. With men in
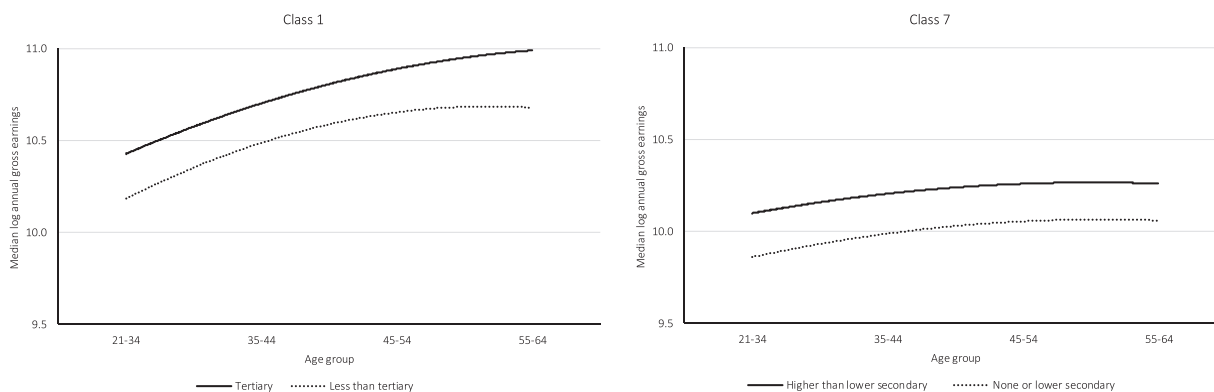

Fig. 3. Estimated median log gross full-year equivalent annual earnings in Class 1 and Class 7 across age groups, for men aged 21–64 in full-time employment with differing levels of. educational qualifications - pooled sample[(a)(b)(c)]

Notes

(a) Pooled sample: weighted using average sample size (N = 3123) per country

(b) Model includes the following explanatory variables: social class, age group, interaction between social class and age group, living in partnership, having a child aged 0–17 in household, foreign birth, industry and fixed. effects for country. Model is run separately for men with differing levels of educational qualifications.

(c) Curves are smoothed using a quadratic function.

the youngest age group and Class 7 being taken as reference, we show that with men in Class 1, involved in a service relationship in its fullest form, and, if somewhat less strongly, with men in Class 2, the sharper rise of earnings with age that occurs than with men in other classes is in fact driven by interaction effects between class and age; or, in other words, by the effect of class position on earnings increasing with age. Further, and again as might be expected, with Classes 3 and 5 such interaction effects, while weakly evident on the basis of our pooled sample, do not appear as significant in any individual nation, and in the case of Class 6 are not present.

Finally, by focusing on men in Class 1 and Class 7 and working with our pooled sample, we are able to examine more directly how far class differences in age-earnings trajectories might be influenced by employees' human capital. Distinguishing within these two classes between men with higher and lower levels of educational qualification, we show that with both classes alike the age-earnings trajectories of those with higher qualifications lie above those with lower qualifications but that the shapes of these trajectories differ little with level of qualification. With Class 1, men at both levels have rather sharply rising age-earnings trajectories, while with Class 7 men at both levels have trajectories that rise far less, and especially after the youngest age group. The clear indication then is that these divergent trajectories are primarily shaped by individuals' class positions, as defined in terms of their employment relations, rather than by their human capital – however important the latter may be in determining the class positions that they hold.

In sum, we have provided evidence that class, as conceptualised with ESEC, following on the EGP schema, is associated with differing age-earnings trajectories for men in ways that show a large measure of cross-national commonality. Class can be regarded as more than just a possible proxy for long-term or lifetime earnings. Class position provides a good indication of how earnings are likely to develop over the course of working life, and patterns of advantage and disadvantage are revealed in this regard, in addition to those that exist in levels of current earnings or in earnings as accumulated over some period. What can be regarded as the logic of the different forms of employment relations that arise out of problems of exchange in the labour market and at the point of production, and that define different class positions, would appear to have a force, at least for men working full-time, that, *pace* Esping-Andersen, is to some large extent independent of institutional context. However, whether the same holds in the case of employees, and in particular of women, working on part-time contracts and possibly with very variable hours, where we have not found it possible to consider full-time equivalent earnings, is a question that must remain undecided until relevant data become available.

Acknowledgements

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.rssm.2022.100726.

References

Albertini, M., Ballarino, G., & De Luca, D. (2020). Social class, work-related incomes, and socio-economic polarization in Europe, 2005-2014. *European Sociological Review, 36,* 513–532.

Becker, G. S., & Tomes, N. (1979). An equilibrium theory of the distribution of income and intergenerational mobility. *Journal of Political Economy, 87,* 1153–1189.

Bihagen, E. (2008). Does class matter equally for men and women? A study of the impact of class on wage growth in Sweden 1999-2003. *Sociology, 42,* 522–540.

Breen, R., & Müller, W. (Eds.). (2020). *Education and Social Mobility in Europe and the United States.* Stanford: Stanford University Press.

Bukodi, E., & Goldthorpe, J. H. (2019). *Social mobility and education in Britain: Research, politics and policy.* Cambridge: Cambridge University Press.

Bukodi, E., Goldthorpe, J. H., & Zhao, Y. (2021). Primary and secondary effects of social origins on educational attainment: New findings for England. *British Journal of Sociology, 72,* 627–650.

Erikson, R., Goldthorpe, J. H., & Portocarero, L. (1979). Intergenerational class mobility in three Western European societies: England, France and Sweden. *British Journal of Sociology, 30,* 415–441.

Esping-Andersen, G. (1993). Post-industrial class structures. In G. Esping-Andersen (Ed.), *Changing classes: Stratification and mobility in post-industrial societies.* London: Sage.

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. https://doi.org/10.1007/s11205-011-9918-2

Goedemé, T., Nolan, B., Paskov, M., & Weisstanner, D. (2021). Occupational social class and earnings inequality in Europe: A comparative assessment. *Social Indicators Research.* https://doi.org/10.1007/s11205-021-02746-z

Goedemé, T. (2019). EU-SILC & Standard Errors. Available at: https://timgoedeme.com/eu-silc-standard-errors/.

, 2020Goedemé, T., & Zardo Trindade, L. (eds.). (2020). MetaSILC 2015: a report on the contents and comparability of the EU-SILC income variables. Institute for New Economic thinking, University of Oxford.

Goedemé, T., Paskov, M. and Nolan, B. (2021). The measurement of social class in EU-SILC: Comparability between countries and consistency over time in Guio, A.-C., Marlier, E. & Nolan, B. (eds.) Poverty and inequality in the European Union. Luxembourg: EU Publications Office.

Goldthorpe, J. H. (1987). *Social Mobility and Class Structure in Modern Britain* (2nd ed.). Oxford: Clarendon Press.

Goldthorpe, J. H. (2007). *On sociology* (2nd ed.). Stanford: Stanford University Press.

Goldthorpe, J. H., & McKnight, A. (2006). The economic basis of social class. In S. L. Morgan, D. B. Grusky, & G. S. Fields (Eds.), *Mobility and Inequality: Frontiers of Research in Sociology and Economics.* Stanford: Stanford University Press.

Iacovou, M., Kaminska, O. & Levy, H. (2012). Using EU-SILC data for cross-national analyses: Strength, problems and recommendations. ISER Working Paper Series 2012–03.

Kim, C., Tamborini, C. R., & 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,* 206-33.

Koenker, R., & Bassett, G. (1978). Regression Quantiles. *Econometrica, 46,* 33–50.

Koenker, R. (2017). Quantile Regression: 40 Years On. Annual Review of Economics, 9, 155–176. doi: 10.1146/annurev-economics.

Lazear, A. P. (1995). *Personnel economics.* Cambridge, Mass: MIT Press.

McGovern, P., Hill, S., Mills, C., & White, M. (2007). *Market, class and employment.* Oxford: Oxford University Press.

Mincer, J. (1970). The distribution of labor incomes: A survey with special reference to the human capital approach. *Journal of Economic Literature, 8,* 1–26.

Rose, D., & Harrison, E. (2010). *Social class in Europe.* London: Routledge.

Sakamoto, A., & Wang, S. X. (2020). The declining significance of occupation in research on intergenerational mobility. *Research in Social Stratification and Mobility, 70,* Article 100521.

, 2021 Salido, O. and Fachelli, S. (eds.) (2021). Perspectivas y fronteras en el studio de la desigualdad social: movilidad y clases sociales. Centro de Investigaciones Sociológicas, Barcelona.

Verma, V. (2006). EU statistics on income and living conditions (EU-SILC): Issues in comparability and data quality. VIIIth International Meeting on Quantitative Methods in Applied Sciences, Sienna.

Yaish, M., & Kraus, V. (2020). On class and earnings trajectories: the use of class and earnings to study intergenerational mobility. *Research in Social Stratification and Mobility.* https://doi.org/10.1016/j.rssm.2020.100507