Scarcity and Abundance: Reconciling Trends in the Effects of Education on Social Class and Earnings in Great Britain 1972–2003

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This study analyses trends in the effects of education on occupational outcomes in Great Britain. It shows that the direction and strength of the trend in the effects of education varies between social class and earnings. The trend in the effect of education on social class is unequivocally downwards, but on earnings it was downwards during the 1970s, levelled out in the 1980s, and has somewhat increased since then. This conforms to an L-shaped or U-shaped trend, depending on the qualification levels that are compared. Supposedly universalistic claims on changing labour market returns in response to changes in demand for and supply of qualifications are not so universalistic as often thought. The middle classes have become increasingly diverse in the kinds of work done, making it difficult to see increasingly functional and/or credentialistic matches between education and class, whereas earnings can easily be adjusted to changes in supply and demand. However, earnings variation has increased between classes, so that the trends in the effect of education on earnings are partly shaped by increased class differentiation in employment relations.

Introduction

During the rise of industrial society, many social scientists observed a decrease in the effect of schooling on occupational outcomes such as occupational status or earnings (e.g. Clogg and Shockey, 1984; Freeman, 1976). This particularly occurred in the 1970s, when the US labour market was flooded with college-educated school leavers. But also more recently it has been shown for a number of countries that education's effects on

occupational *social class* decreased, often explained by an increase in the relevance of qualities obtained outside education (Breen and Goldthorpe, 2001; Goldthorpe and Mills, 2004; Jonsson, 1996; Vallet, 2001; Whelan and Layte 2002).

However, claims have also been made that jobs have become more complex since the 1980s, leading to a need for qualified personnel for an increasing number of jobs. The sharp rise in the wage premium from higher education during the last decades must be seen in this context (Ashenfelter

and Rouse, 2000; Levy and Murnane, 1992). Similarly, modernization theory has argued that the impact of education on occupational status has strengthened due to increased complexity of work (Blau and Duncan, 1967; De Graaf and Luijkx, 1993; Featherman and Hauser, 1978).

How can these findings using linear measures of occupational outcome (status, income) be reconciled with the consistently found downward trend in the education effect on social class? This study tries to unravel trends in the impact of education on work outcomes in Great Britain, and to explain the anomalies on the post-1980s era discussed above. I aim to show that the arguments given by the increased education effects approach particularly pertain to income as occupational outcome, and that the arguments on decreasing education effects approach pertain to social class outcomes.

So why should we bother, if both approaches have the right on their side within their own academic circles? There are three reasons for this. First, the arguments of both approaches seem valid to all occupational outcomes, but they are not. Functionalist and neoclassical economics viewpoints are that employers increasingly rely on educational achievements in selecting and rewarding personnel because of functional requirements and skills scarcity. Researchers in the social class tradition have questioned the validity of this hypothesis on the basis of the claim that other, *non-educational* attributes have gained in relevance on the labour market (Breen and Goldthorpe, 2001; Goldthorpe, 1996). However, both claims may be valid *but only* for the type of outcome that is considered. The increased relevance of non-educational skills does particularly pertain to social class as occupational outcome, whereas the scarcity argument may particularly pertain to occupational outcomes that are directly affected by scarcity: earnings.

Second, relatedly, the downward trend in the impact of education on social class has been put in a broader discussion on meritocracy in the last few years (e.g. Breen and Goldthorpe, 2001; Whelan and Layte, 2002). Insofar, the increasingly relevant non-educational skill types that this approach refers to, for example social skills or personality, are related to social origins, a 'meritocratic' society could legitimately select on social origins as a basis for productive skills (Goldthorpe, 1996). Selecting on origin-related skills would thus bring productivity into the organization, which could hardly be denied as being at least partly meritocratic. This places the 'from ascription to achievement' paradigm (Blau and Duncan, 1967) as a way to study increased selection on merits into a somewhat problematic situation; merit-enhancing attributes are no longer synonymous with achieved characteristics such as education, but are also directly related to social origin.[1]

However, this line of reasoning would lose some of its validity if *earnings* are *increasingly* dependent on education. If the modern economy would become increasingly inefficient by selecting on education as a basis for merits, as studies on increased selection on non-educational skills suggest, then we should observe this most directly in the earnings that result from negotiations about skills and productivity. An increased (or stable) impact of education on earnings makes claims about the decreasing relevance of education for the social differentiation of life chances suggested by class analysts somewhat premature.

Thirdly, the observed downward trends in the effect of education on social class has been shown for a number of European countries (Britain: Breen and Goldthorpe, 2001; Goldthorpe and Mills, 2004; Sweden: Jonsson, 1996; France: Vallet, 2001; Ireland: Whelan and Layte, 2002; The Netherlands: Ganzeboom and Luijkx, 2004), whereas the literature on increased educational effects on earnings is predominantly North-American (e.g. Ashenfelter and Rouse, 2000; Levy and Murnane, 1992). This may lead us to suspect that an increasing relevance of education on the labour market is a typical North-American phenomenon, whereas a decreased relevance is mainly a European issue. However, to judge this interpretation of the existing literature, it is relevant to study trends in the effect of education on earnings and social class using exactly the same data sets within the same research framework, even though both trends have received considerable attention in their own right.

The research questions are:

1. To what extent has the impact of education on social class and earnings changed between 1972 and 2003 in Great Britain?

2. How can we explain cross-temporal variation in trends in the association between education and social class and earnings?

3. How can we explain differences in these trends between social class and earnings?

Generic Theories on the Education Effect: Scarcity, Abundance, and the U-shaped Trend

We distinguish two possible explanations for upward and downward trends in the effects of education on occupational outcomes. These two approaches can be seen as complementary rather than competing. The first sees changes in the impact of education resulting from changes in the aggregate 'match' of supply of and demand for qualifications, i.e. over- or under-schooling. Educational attainment has increased tremendously, which has, according to many, not been matched by a restructuring of the labour market. This means that people became increasingly over-qualified for the available jobs, which led to changes in bargaining power of various educational levels. This is the approach most often encountered in studies on the impact of over-schooling on returns to education, for instance by distinguishing between required and obtained levels of schooling for a specific job. The second explanation considers trends in the impact of education on occupational outcomes resulting from time-varying selection on qualifications *within* jobs. This explanation holds that the same job requires more education in some periods than in other periods, without this being a consequence of increased or decreased supply of qualifications. Particularly, technological developments are generally linked to this approach. Studies on the college/non-college wage gap take, for example, this approach.

Changes in the Match between Supply of and Demand for Qualifications

The impact of education on work seems to have decreased most substantially in the period up to the 1980s. Neoclassical economics seeks part of the explanation for this phenomenon in the sharply increased supply of high-level qualifications since WWII (e.g. Freeman, 1976; Levy and Murnane, 1992). Because too many people received higher-level training, their bargaining power decreased, leading to lower earnings than before. But not only absolute earnings of college graduates went down. Returns to years of schooling in excess of the required level of schooling for a job are much lower than to the years of required schooling (Groot and Maassen van den Brink, 2000; Harmon *et al.*, 2001). This means that the rate of return to schooling on average, thus the difference between schooling levels, goes down if average qualification levels rise faster than the restructuring of the labour market requires. Similarly, studies on the college/non-college wage gap argue that this gap becomes smaller when educational attainment increases relative to the occupational structure (Ashenfelter and Rouse, 2000; Levy and Murnane, 1992).

One factor responsible for a tremendous upward shift in educational attainment is the political climate in Britain in the 1960s and 1970s. Educational systems in many countries have been restructured in these decades, largely induced to increase schooling levels and reduce inequality. Left-wing governments were in power in many countries, including the United Kingdom. Redistribution of power and knowledge, an important aim of social democracy, could be established by enlarging enrolments into higher education. The new influx led to the emergence of many new institutions of higher education. Such policies were, if at all, only indirectly motivated by changes in demands on the labour market. This climate could easily lead to an increasing discrepancy of educational achievements and occupational demands. Brown (1990) called this period the 'second wave' of British educational policy. This wave started with the 1944 Education Act, which promoted a schooling system in which ability determined educational opportunities, and not parental wealth like in the 'first wave'. Also, the comprehensive schooling system initiated in the 1960s is generally seen as part of this wave to prevent the waste of talent in the lower social classes.

After the 1970s, policies were far less focused on increasing schooling levels. Particularly in Britain, under the Conservative governments of Thatcher, the 'second wave' of educational policy was abandoned to make room for a 'third wave' (Brown, 1990). This third wave was primarily aimed at promoting the market in the education system, where enrollment in education was not something that the government should interfere with. Part of this third wave is the 1988 Education Reform Act, which further promoted market rules in education. The evident differences in educational policies between the Labour and Conservative governments makes Britain an interesting case to study

cross-temporal variation in the education effect on schooling. In addition, particularly in countries where the education system has a screening function rather than being an indicator of productive skills, like Britain, credential inflation makes people invest in education more even if its absolute returns fall (cf. Boudon, 1982; Groot and Maassen van den Brink, 2000). Also, both the downward trend in the effect of education on social class, and the upward trend on earnings in the last decades are reasonably well documented for Britain, although a thorough comparison has not been made thus far.

Time-Varying Selection within Jobs

The second argument behind possible trends in the effect of schooling on work assumes that, irrespective of over- or under-schooling, in some periods educational qualifications are more important in the selection, allocation, and compensation of workers than in other periods. The labour market has been developed toward more knowledge-intensive, highly skilled work tasks, including a large emphasis on (computer) technology (Crompton et al., 1996; Gallie et al., 1998). Technological developments are a crucial determinant of whether jobs become more complex, and thus of the demand for detailed qualifications that prepare for particular types of jobs. If a certain job becomes more complex, an employer will look for a candidate who possesses a qualification that prepared for the job, more than if a job becomes more routinized. If, on the other hand, investments have been made some time ago, routinization of jobs implies that formal educational credentials become less relevant, because informal on-the-job training will enhance skills to be productive in that job.

Functionalists have claimed a trend from 'particularism' to 'universalism' on the labour market, indicating that education has become more important because of 'differential functional importance' of social positions and 'differential scarcity of personnel' for filling up those positions (Davis and Moore, 1945: 243–244; see also Blau and Duncan, 1967; Treiman, 1970). In the status attainment tradition it is argued that job complexity increases linearly with 'modernization' (Blau and Duncan, 1967; Featherman and Hauser, 1978; Treiman, 1970). However, the comparative study on wage returns to schooling by Harmon et al.

(2001) shows that the trend in the impact of education is far from linear. Rather, it seems that complexity of jobs increases most substantial if there is much technological development. As investment in research and technology varies with the economic tide, it seems logical to expect that trends in the effects of schooling, insofar not related to over- or under-schooling, follow the economic tide and related technological investments.[2] This means that the impact of education on occupational outcome goes downwards in the period up to the early 1980s, when economic growth was slow. After the economic stagnation of the early 1980s, the upward boom in economic growth has increased the impact of schooling on occupational outcome from this period onwards.

An L-shaped or a U-shaped Trend?

Both perspectives suggest that the effect of education has gone down during the 1970s. Over-education increased, leading to a decrease in bargaining power of the skilled workforce. In addition, economic growth was slow, so that also within jobs education became less important. From the 1980s onwards, though, the generic theories predict that the effect of schooling no longer goes downward. The rapid technological developments increased the demand for highly skilled labour, so that the bargaining power of the educated workforce began to rise. A weak interpretation assumes that the downward trend in the effect of education has come to a halt, and has stabilized since the 1980s (an 'L-shaped trend'). A stronger interpretation indicates that the effect of schooling has even gone up in the period from the 1980s onwards (a 'U-shaped trend').

Applicability of Generic Theories to Income and Social Class

The upward trend in wage returns to education from the 1980s onwards is often used to explain increased wage inequality as measured by, for example, Gini coefficients or decile ratios. The logic behind this reasoning is that rising wage inequality is a consequence of the increase in bargaining power, or 'control over the job'

(Sørensen and Kalleberg, 1981) of people with higher educational achievements due to the increasing shortage of high-level skills and the growing surplus of low-level skills (Levy and Murnane, 1992). Thus, insofar we see increasing wage dispersion; increasing educational differentials might partly explain it.[3]

However, if we look at other measures of occupational outcome, it is less evident that variation has increased. Instead, the restructuring of the labour market has probably caused a *decrease* in the variation in a number of measures of occupational outcome. Changes in occupational distributions has plausibly caused a *decrease* in 'inequality' in these measures. This makes the explanandum different from the example on earnings, thus leading to a need for a different theory.

So why would we find a decrease in 'inequality' in social class position? The most significant changes in the economy are the tremendous decrease of the primary sector, a steep increase of the secondary sector from the late 19th century up to the mid 20th century, and a sharp rise of the tertiary sector afterwards (Bell, 1974; Bills, 2004; Lenski, 1966). The middle classes have tremendously increased in size, which may have led to decreasing variation in the class distribution similar to what has been shown for educational distributions (Hauser and Featherman, 1976; Rijken, 1999). Furthermore, this increase has only been possible through increased (absolute) upward mobility from lower origin classes. These processes have made the middle class a group that has become very diverse in all kinds of ways; varying from social origin, political orientation, and, most importantly for the present research, the kind of work that is done.

Whichever social class approach is taken, the kinds of work done in the middle classes (otherwise called the salariat or the service class) seem to have increased considerably. For example, through processes of bureaucratization and professionalization, an increasing number of jobs are in what is called 'management' [Abbott, 1988; Weber, 1978 (1922)]. At first, this has led to increased 'credentialization' of higher-level jobs; detailed formal qualifications became a requirement for access to privileged positions. The character of jobs in management has, however, changed from uniquely being a highly rewarded top-level occupation to being either that or something a bit

lower on the hierarchical ladder. For example, one typical occupation that has grown in size is service sector management. Service sector managers (e.g. in retail, hotel management) have quite similar employment relations as the 'old' top-level managers of the non-service sector, or their bosses in the service industry, at least in terms of, e.g. contract types and pension schemes. However, it is unlikely that credentialism has evolved to the same extent for the new group of managers, or that functionalist matches are established through education for service sector management as much as for management jobs in non-service organizations. Instead, there is more room for non-educational 'soft' skills in those occupations (Jackson et al., 2005).

In addition, not only in the 'management' category of middle class jobs, but also in the group of professionals, the kinds of work done have become more diverse. Up to the 1970s a relatively limited number of occupations were known to be the professions, such as teachers, lawyers, and doctors, to name a few. Since then the professionals have grown in size, and now include many occupations in, e.g. consultancy and administration (cf. Abbott, 1988). Thus, the professionals have not only increased in size because the 'old' professions have grown, but also because many new occupations have appeared. These new jobs are particularly the ones for which Breen and Goldthorpe (2001) assume that 'people processing' skills are relevant, more than formal credentials.

In sum, the developments are not only that particular occupational groups have increased in size, but also that, in a class constellation, more diversity can be observed within classes in the kinds of work done. Therefore, elite strategies of 'social closure' as a means to keep privileged positions closed off (Collins, 1979; Murphy, 1988) now only seems to apply to *some* parts of the middle class. Additionally, such strategies of social closure seems to vary strongly within classes between occupations, and increasingly so (Grusky and Sørensen, 1998; Weeden and Grusky, 2005).

This relatively recent process of increased middle-class variation, mainly since the 1970s–1980s period, can be expected to have had an impact on both the relevance of education, as well as on the relevance of other individual attributes for the selection and allocation process in middle-class jobs. The increasingly imprecise understanding of what the middle

class comprises of explains why education has continued to lose its relevance for class attainment in empirical research (cf. Grusky and Sørensen, 1998; Grusky and Weeden, 2001; Weeden & Grusky, 2005). The middle class has simply become too blurred a concept to detect an increasing number of functional and credentialistic matches between qualifications and jobs (cf. Brown, 1995; Crompton, 1993; Savage *et al.*, 1992). At the same time, other personal attributes may have gained in relevance in providing access to middle-class jobs. The changing nature of the economy may have led to an amplified emphasis on personality or social skills, as many of the jobs that now make up the middle class are in 'people processing' (Breen and Goldthorpe, 2001: 84; Erikson and Goldthorpe, 2002). It is, however, unclear why an increase in the relevance of 'other components of competencies' in the modern free-market economy would imply a decrease in the relevance of education, as Breen and Goldthorpe suggest. Selection on various characteristics is not a zero-sum game; it is very well possible that other types of capacities become increasingly relevant *in addition to* education for certain occupations. The downward trend in the effect of schooling on social class can thus foremost be seen as a consequence of the increasing diversity of the middle classes, rather than of a non-existing trade-off between educational and non-educational skills.[4]

This interpretation is different from the one of Ganzeboom and Luijkx (2004), who explain the downward trend in the effect of education on social class in the Netherlands by the changing distributional characteristics of *education*. Their argument is that the variance in educational attainment has decreased, which makes it harder for employers to select on education. However, this argument would also imply a downward trend in the education effect on earnings. The argument in the present article instead emphasizes distributional aspects in *social class*, hence allowing for a different trend between social class and earnings.

These arguments suggest that the turning around of the downward trend in the effect of schooling on occupational outcome into a stabilized (L-shaped) or upward (U-shaped) trend is more pronounced with regard to earnings than with regard to social class (*Hypothesis 1*). Indeed, with regard to social class, it can be expected that the effect of education

has continued to go down from the 1970s to present (*Hypothesis 2*).

Earnings Differences Between Social Classes

As regards changes in earnings differentials between social classes, there is only one way to reconcile a downward trend of the effect of education on social class (arrow A in Figure 1) with either a levelling-off (L-shaped) trend or an increased (U-shaped) trend in the effects on earnings (arrow B in Figure 1). These trends can only be squared if the earnings differentials across classes have increased across time (*Hypothesis 3*), see arrow C in Figure 1. How can increased class differentiation in earnings be explained? Gallie *et al.* (1998) have shown that members of the service class (managers and professionals) generally experienced more up-skilling in their job and increased job responsibility than members of the working classes in the 5 years prior to their 1992 survey. As both aspects are related to earnings, class differences in earnings could very well have increased. Additionally, the decline in union membership during the 1980s and 1990s has probably deteriorated the position of the working classes (cf. Ebbinghaus and Visser, 2000), which further increases class differences in earnings. The service classes may have become more successful in gaining better employment relations (including income) in times of economic growth.

Furthermore, an increase in the social class earnings differentials may explain why educational groups have further differentiated their earnings. If this is the case, the possible upward (or stabilizing) trend in the effect of schooling on earnings may no longer be found once we hold constant for a change in the social class earnings differentials (*Hypothesis 4*).
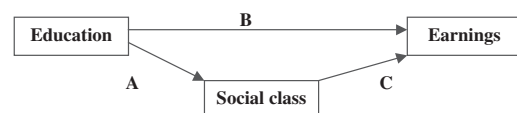

Figure 1 Diagram of direct and indirect education effects on social class and earnings.

Research Design

Data

The data sets that are used to study trends in the effects of education come from the General Household Surveys of 1972–2003. These surveys are carried out in Great Britain on a yearly basis among members of a representative sample of households, except in 1997 and 1999. Only household members between 25 and 64 years of age are included in the present analyses. Unfortunately, parental social class is only available in the surveys up to 1992. Although sociologists often control for social origin in studying trends in the effect of education on occupational outcomes (e.g. Blau and Duncan, 1967; Breen and Goldthorpe, 2001), the omission of social origin has no impact on the trends in the effect of education on either social class and earnings with the present data sets (analyses available upon request).[5] Hence, we study trends in the returns to education without father's social class throughout this article. Furthermore, only those cases were included that had no missing values on any of the used variables. The total number of observations that are analysed are $N = 236{,}624$ (105,747 women and 130,877 men).

Variables

The following variables are used in the analysis. *Education* is measured in five categories. These categories are ordinally structured. The first group comprises people with primary or no qualification. The second group consists of all first qualifications at the secondary level, usually taken at the age of 16. These qualifications are known as Ordinary Levels (O-levels) or General Certificate of Secondary Education (GCSE), depending mainly on the time period. The third group of qualifications include the Advanced level (A-level) secondary education, which give access to higher education. Also vocational programmes are included in this category which are accessible with an O-level qualification. The fourth educational category includes all non-degree programmes in higher education. The last educational category includes all degree-level qualifications.[6]

To study trends with the cross-sectional data that are at hand, I choose to compare *periods* (i.e. the years of interview) rather than birth cohorts.

The reason for this is that there is only information on the 'present' job and income. This means that, if we were to use birth cohorts instead of periods, it is hard to disentangle trends in the effects of education across cohorts and across the life cycle. Across the surveys, our sample consists of people born between 1908 (age 64 in 1972) and 1978 (age 25 in 2003). This means that the older birth cohorts give on average information about their occupation and income at an older age than the younger birth cohorts. If the expectation is that education effects have decreased across birth cohorts, we might find the opposite just because earlier in the life cycle the effects are stronger, off-setting the overall decreasing impact. To put it differently, we may assume that, in a cohort design, age effects are properly controlled by including age in the regression equation. However, such a model assumes that the age slope would be similar across birth cohorts but whether that assumption is valid is something we cannot properly test due to lack of data.

If we use period as the basis for cross-temporal comparison, this problem is more or less eliminated, since people of all ages are included in each survey year, and the age distribution of 25–64 years across the years is more or less constant. This way, we cover the time span of 1972–2003, which is long enough to study the particular anomalies expected in the post-1980 period. Time periods that are distinguished are 1972–1975, 1976–1979, 1980–1983, 1984–1987, 1988–1991, 1992–1996, and 1998–2003.

An additional reason for comparing periods rather than cohorts is that many arguments on why returns to schooling have dropped in the 1980s affect the whole labour force (such as technological change). Similarly, the up-swing in the education effect is mainly referred to as being found since the early 1990s, rather than that specific cohorts are known to have a higher effect than others. For this reason, both the earnings literature as well as the literature on variation in the impact of schooling on social class employs the period perspective.

Social class is measured with a widely used version of the Erikson and Goldthorpe class scheme into seven categories (Erikson and Goldthorpe, 1992): the higher service class (I in the EG scheme); the lower service class (II); the routine non-manual labour class (III); the petty bourgeoisie (self-employed with no or few employees including self-employed farmers; IVa, IVb, and IVc);

the foremen of manual workers and technicians (V); skilled manual workers (VI); and, lastly, semi- and unskilled manual workers, including agricultural workers (VIIa and VIIb).

Earnings are measured on an hourly basis, both from dependent employment and own business. A large majority of our sample (90.5 per cent) has only earnings from dependent employment. The remaining group consists mainly of people with only earnings from self-employment (about 8.8 per cent), and of people with both dependent and self-employed sources of earnings (0.7 per cent). Earnings of employees are, if possible, checked by the interviewer on pay slips. Self-employed income was measured by gross profits before taxes. It was asked for the year previous to the interview, but if people had been self-employed for a shorter period, profits were adjusted accordingly. The top and bottom 0.5% of the earnings distribution in every year is omitted. Hourly earnings of the years under study are adjusted for inflation using the Retail Price Index obtained from the Office of National Statistics, so that all amounts are in January 1987 pounds sterling. After this standardization, two earnings measures are derived from hourly earnings. First, for the regression analysis we employ the natural logarithm of hourly earnings. Second, for the log-linear association models we employ a categorical earnings measure with seven earnings septiles.

Models

Two types of statistical analyses are carried out to study trends in the effects of education on occupational outcome. First, we employ least squares regression analyses with earnings as a dependent variable. The central focus in this analysis is on the changes across the observed periods, in particular whether the effects of education on income have first decreased (roughly until the early to mid-1980s), and later increased. These models are well-suited for studying effects on interval variables such as earnings, particularly since various interactions between variables can be modelled in a parsimonious way.

Second, log-linear models are used. One of our measures of occupational outcome, social class, is a multi-dimensional concept. Classes can not only be ordered in a hierarchical way, but have other dimensions too. In particular, the farmers

and the petty bourgeoisie fit less well on the hierarchical dimension (Erikson and Goldthorpe, 1992). Log-linear models are well-suited for studying associations between variables of nominal measurement level. To illustrate more crucially the difference in the applicability of generic theories of supply and demand between earnings and class, I shall use a categorical earnings measure and employ similar log-linear models as used for social class. The basic five educational categories by seven occupational outcome categories table is made for each time period. 'Uniform difference' (Erikson and Goldthorpe, 1992) or the identical 'log-multiplicative layer-effect' (Xie, 1992) model has been developed that estimates with one parameter the change in all the log odds ratios between two tables. More specifically, it estimates in what way all the log odds ratios of the education by occupational outcome table change between two time periods. These models can be expressed as follows:

$$\log F_{ijk} = \mu + \lambda_i^{\mathrm{E}} + \lambda_j^{\mathrm{D}} + \beta_k X_{ij}$$

Where $\log F_{ijk}$ is the natural logarithm of the expected frequency in cell ijk, μ is the intercept, λ_i^{E} the main effect of education, and λ_j^{D} the main effect for destination. Furthermore, $X_{ij} = \lambda_{ij}^{\mathrm{ED}}$, is equal to the interaction between education and destination and its effect. For each period k (of a total of K periods) a β_k is estimated, called a uniform difference (unidiff) parameter, which indicates by which factor the log odds ratios of the ED table should be multiplied compared with a reference period. If the association between education and occupational outcome goes down compared with the reference period, then the unidiff parameter is <1. If it goes up, it is >1.[7]

Trends in the Effects of Education: Results

Regression Models on Hourly Earnings

In order to test the changes in the effect of schooling on earnings, regression models are estimated with interaction effects between educational dummy variables and period dummies. The results of these regression models are shown in the Appendix Table A1. For ease of interpretation, the relevant regression coefficients are placed
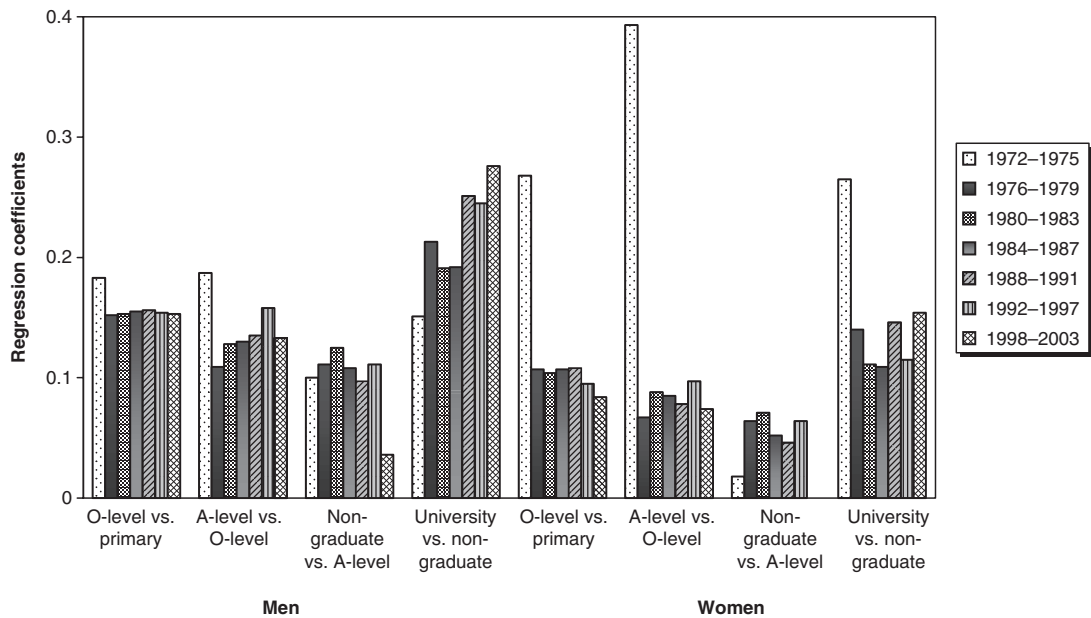
Figure 2 Trends in logged hourly earnings relative to the preceding educational level. Use is made of the backward difference contrast, in which regression coefficients indicate the difference with the preceding category in the educational distribution, rather than with a fixed reference category (available in the desmat programme in Stata)

in Figure 2. The regression coefficients of educational level are interpretable as relative to the preceding category in the educational distribution, rather than to a fixed reference category. This allows us to see trends in earnings differentials between people of two adjacent educational levels. Moreover, regression coefficients on logged hourly earnings are similar to proportional effects (Hauser, 1980), allowing economists to compute rates of returns directly from regression coefficients (e.g. Harmon et al., 2001). Therefore, the vertical axis of Figure 2 can roughly be interpreted as proportional differences in hourly earnings of one educational level relative to the preceding level (or, when multiplied by 100, as percentage differences).

Figure 2 shows that earnings gains from O-levels relative to primary education dropped a little bit in the mid-1970s relative to the first period of observation (1972–1975), and remained more or less constant afterwards (for both men and women). Also the gains from having obtained A-level education dropped after 1975, remained stable afterwards for women, and increased again from the early 1980s to the late 1990s (although not significantly; see Appendix Table A1).

For men, the returns to non-graduate tertiary education (relative to A-levels) is constant across time. However, for women the returns to non-graduate education were *highest* in the period 1980–1983, contrary to the expected U-shaped pattern. As expected, the additional earnings that men and women receive from university education (relative to non-graduate tertiary education) have increased significantly from 1988 onwards. For women, there is a clear U-shaped pattern in the gains from university education; with the lowest gains in the period with the highest gains of non-graduate tertiary education (1980–1983).

In short, the overall picture is that we see, depending on the educational categories that are compared, a U-shaped or L-shaped trend in the returns to education. It is L-shaped in the returns to O-level and A-level education (relative to their preceding educational categories), and U-shaped in the returns to university education. However, for women we see one clear deviation from this picture, which is the *inverted* U-shape in the returns to non-graduate tertiary education. Apparently, in periods of slow economic growth, low levels of technological investments, and high unemployment,

Table 1 Fit statistics Period × Education × Occupational outcome table, men and women separately*

Model	Men N = 130,877				Women N = 105,747			
Social class	G^2	df	△ (%)	BIC	G^2	df	△ (%)	BIC
1. Main effects P + E + D	71,659.08	228	28.60	68,972.78	70,588.69	228	32.34	67,951.00
2. Period effects PE PD	49,780.92	168	22.48	47,801.54	43,405.87	168	23.22	41,462.31
3. Merit selection ED PD PE	1024.84	144	2.88	−671.77	1257.04	144	3.11	−408.87
4. Trend in education effect PE + PD + P*ED	508.45	138	2.13	−1117.47	497.01	138	1.83	−1099.49
Earnings septile								
1. Main effects P + E + I	44,716.25	228	22.17	42,029.95	57,163.91	228	28.56	54,526.22
2. Period effects PE PI	27,061.84	168	16.77	25,082.46	33,112.28	168	20.29	31,168.72
3. Merit selection EI PI PE	593.84	144	2.07	−1102.77	648.44	144	2.02	−1017.47
4. Trend in education effect PE + PI + P*EI	477.71	138	1.77	−1148.21	469.79	138	1.78	−1126.71

*Seven periods (P) by five educational levels (E) by seven social classes (D) or income septile (I).
Source: General Household Surveys 1972–2003.

employed women do relatively well with a vocationally oriented tertiary programme (including nursing, and lower level teaching qualifications) relative to A-level qualifications. One explanation for this is of course that A-levels do relatively poorly in such periods, which can also be seen in the contrast between A- and O-levels.

Log-Linear Models

Now that we have seen that the effect of schooling on hourly earnings follows an L-shaped, and perhaps a U-shaped trend, we will now analyse the trend in the effect of education on social class using log-linear association models. Furthermore, in a similar way we also analyse effect trends on an ordinal measure of earnings, thereby matching the analysis to a seven-class occupational outcome.

Table 1 shows the fit statistics of log-linear association models for social class and ordinal hourly earnings, respectively. Models are fitted for men and women separately. Fit statistics that are displayed are the χ^2-distributed G^2, △ (the percentage of subjects wrongly classified by the model), and the Bayesian Information Criterion (BIC) (Raftery, 1995). Especially the latter is relevant because we deal with large sample sizes.

Table 1 shows that the independence model without periodic changes in the class, and education distributions (model 1) fits poorly. Model 2 shows

that there is variation across periods in the educational, class and earnings distributions, as the fit has improved significantly compared with model 1. Furthermore, unsurprisingly, model 3 shows that there is an association between educational attainment and class and earnings positions. Harmonizing between-period change in one single unidiff–parameter for each period (model 4) shows the best fit, as can be seen by the negative value of BIC and the low percentage of wrongly classified individuals (△).

So what do these trends look like? Figure 3 shows the unidiff parameters of model 4, for men and women separately. With regard to social class, the unidiff parameters go monotically down. This means that the odds ratios measuring the association between education and social class have become significantly weaker across time.

With regard to earnings septiles, we see quite a different pattern. For men, the trend in the effect of education on earnings septile follows a U-shape, with the exception of the last period, when the impact of education on earnings seems to have gone down. Thus, if very similar statistical models are used, a clear downward trend is found of education on social class; and a U-shaped trend is found on earnings. For women, the trend in the effect of education on earnings septiles goes monotically down with the exception of the 1980–1983 period, when the impact was strongest. These findings support Hypotheses 1 and 2.[8]
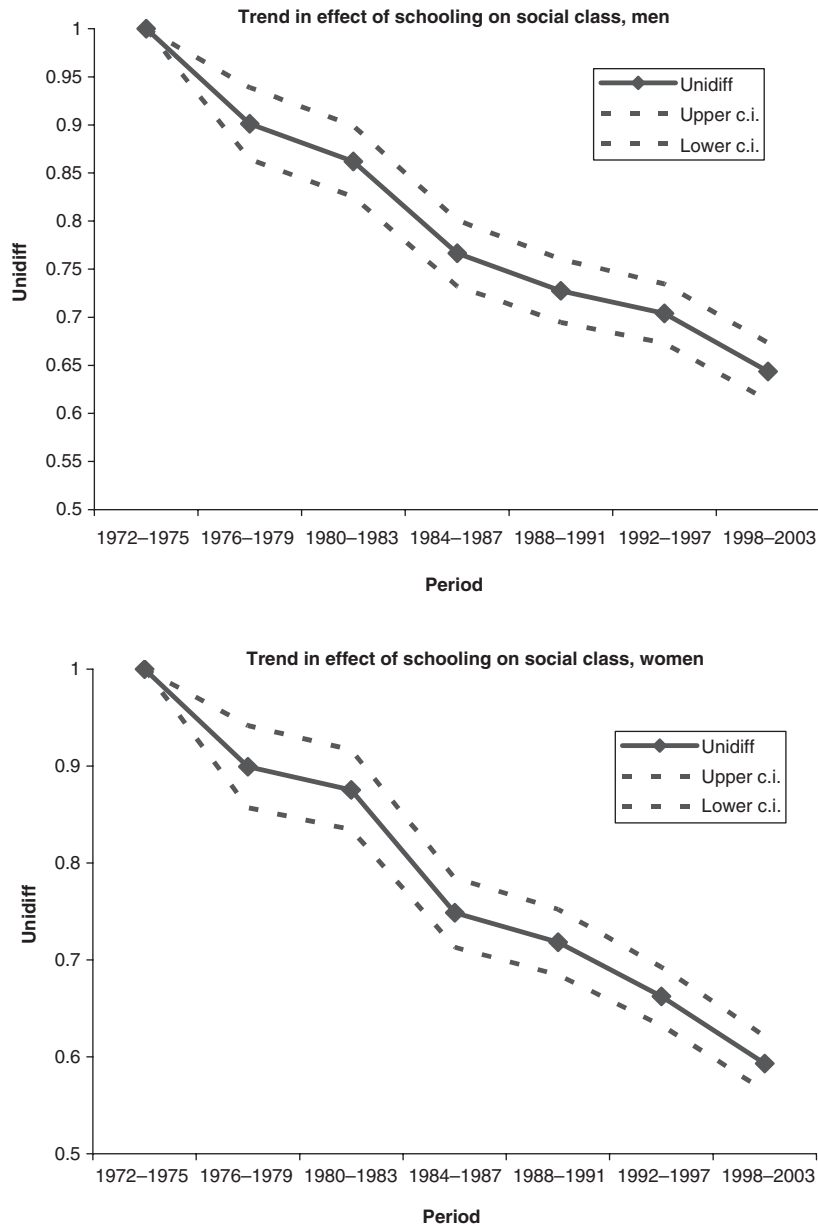
Figure 3 Trends in the effect of education on class and earnings septile as measured by uniDiff parameters (and 95% confidence interval).

Earnings Variation between Social Classes

Above, it was shown that the trend in the effect of education on social class is unequivocally downwards. With regard to earnings, the trend behaves more like an L-shaped, and perhaps a U-shaped trend. The downward trend has

certainly come to a halt during the 1980s, and has even increased in a number of statistics. These findings can only be reconciled if there has been an increase in social class differentiation in earnings for the periods when an anomaly is observed. To test this argument, we extended our regression models on earnings with a trend analysis of the

Trend in effect of schooling on earnings septiles, Men

Trend in effect of schooling on earnings septiles, Women
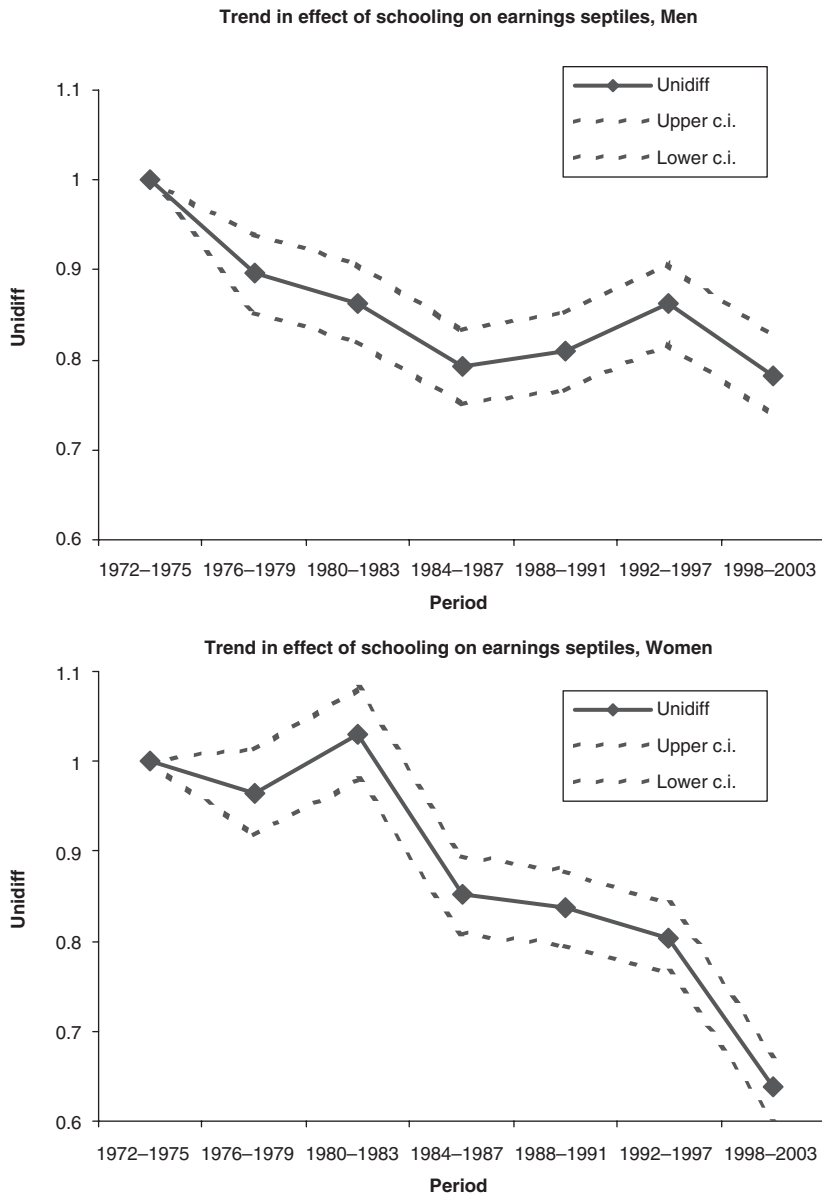
Figure 3 Continued

effect of social class on earnings. Figure 4 shows graphically the regression coefficients for each social class relative to the preceding (lower) class in the distribution. It can be seen that the earnings differences between adjacent social classes have slightly increased (cf. Bihagen, 2005). For men, the difference between classes I and II was highest in the years around 1990. The difference between the lower service class (II) and the routine non-manual workers has increased since the early 1980s. One remarkable finding is that the self-employed earn, per hour work, much less than the foremen and lower level technicians, although the difference has become much smaller since the 1980s. This holds for both men and women.

Figure 4 Trends in the impact of social class on earnings. The results from this graph come from regression model 4 of Appendix Table A2

In sum, the pattern of earnings differentials between social classes partly explains the anomaly in the trend in the impact of education on class and earnings. Earnings differentials across classes have slightly risen (supporting Hypothesis 3), although this trend is not fully responsible for the trend in the education effect. If the trend in the effect of education on earnings is compared bet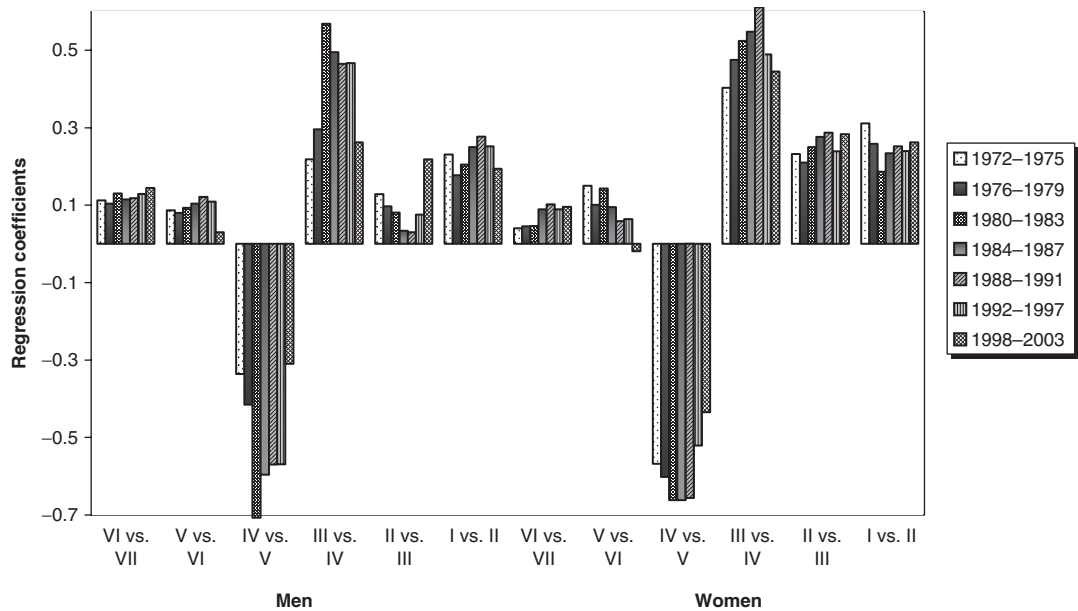ween models 2 and 4 (Appendix Tables A1 and A2), the trends in the effect of schooling have reduced but not completely vanished. This partly confirms Hypothesis 4.

Conclusions and Discussion

This study tried to shed some light on the developments in the effects of education on occupational outcome during the last 30 years. More specifically, we aimed to show that the direction and strength of the trend in the effects of education varies between measures of occupational outcome, and between periods within the observed time span. As regards differences across measurements, we focused on social class and earnings, and revealed that the trend in the effect of education on social class is unequivocally

downwards. This is in line with earlier findings on a number of European countries (Breen and Goldthorpe, 2001; Breen and Whelan, 1993; Ganzeboom and Luijkx, 2004; Goldthorpe and Mills, 2004; Jonsson, 1996; Vallet, 2001; Whelan and Layte, 2002).

With regard to earnings, the trend in the effect of education does not follow the same pattern. Rather, the downward trend in the effect of schooling on earnings from the early 1970s to the early 1980s has come to a halt, and has increased for university education after that period for men. Thus, as regards earnings, we see an L-shaped or a U-shaped trend in the effect of schooling, depending on the educational level that we observe.

Trend differences between social class and earnings are explained by the fact that social class is a measure for which dispersion cannot unlimitedly increase; an increased demand for highly skilled workers cannot lead to unbounded upward shifts in social class position of those with higher levels of schooling. Whereas neo-classical economic theory would predict that, under such a scenario, the effect of schooling would increase because earnings of highly educated people are adjusted upwards,

such adjustments can only limitedly be realized with regard to social class.

Therefore, our explanation for differences in trends follows from *distributional aspects* of social class and earnings. This is a different argument from the ones often found in the literature on both trends. The explanations that class analysts put forward are usually held to pertain to all labour market outcomes, but they are not. First, it is argued that the decreasing relevance of education 'on the labour market' (read: for class attainment) is due to distributional aspects of education. In a highly schooled society, employers can rely on educational qualifications in the selection and allocation process less well than in a low-skilled society (e.g. Ganzeboom and Luijkx, 2004). Although this argument may initially seem to pertain to all labour market outcomes, it is particularly plausible with regard to placement in social class position. Differences in trends between class and earnings are at odds with this reasoning.

Second, the literature on the increased relevance of education for earnings argues that educational qualifications become more important on the labour market (read: for earnings attainment) when the demand for qualifications rise. Either through processes of under-qualification or increased educational selection within jobs, an increased demand for qualifications will improve the bargaining position of the skilled workforce. A stronger bargaining position leads to advantaged labour market outcomes if these are negotiated about. And indeed, people do negotiate about their earnings, but not about their social class position. Social class is valuable for studying various inequalities related to education, health, and social mobility—'class as living condition' in Sørensen's terms (2000). But it may not be the right concept to test labour market theories with regard to trends in education effects, which heavily rely on mechanisms of supply and demand.

Importantly, the earnings differentials between social classes has increased substantially since the late 1980s onwards. Indeed, this upward trend should be found to reconcile the downward trend on social class with the stabilized, or upward, trend on earnings. This gives us ground to believe that social class operationalized in a limited number of categories is still a valuable concept to study inequalities, despite calls for a more fine-grained classification (Grusky and Sørensen, 1998). There are several possible explanations for an increased earnings differentiation across social classes, which need further examination. First, union membership has decreased (Ebbinghaus and Visser, 2000), which has deteriorated the collective bargaining position of predominantly medium and lower level jobs. Second, the service classes have improved their relative position. Structural employment relations, which define social classes (Goldthorpe, 2000), have got better, particularly of the service classes. Trends in over- or under-supply of educational qualifications then lead to earnings differentiation through the employment relations that are formed on the labour market. Thirdly, according to Gallie *et al.* (1998), social classes differ in the extent they have experienced changes in skill and job responsibility, with more changes experienced by the professional and managerial classes, and less changes among the working classes. As these job assets have a positive relation to earnings, and are directly linked to the educational qualification that people brought with them, the trend in bargaining power of different qualifications may have led to increasing inequality in earnings via the social class position that is obtained.

What do these findings tell us about issues of meritocracy in modern free-market economies? There have been a number of sociological studies in the past years that have attributed the decreasing impact of educational credentials on social class position to either the suggestion that these societies are not becoming increasingly meritocratic, insofar education is a good indicator of merits, or that non-educational meritocratic characteristics, such as personality or social-communicative skills, are increasingly relevant in an advanced free-market economy (Breen and Goldthorpe, 2001; Breen and Whelan, 1993; Goldthorpe and Mills, 2003; Jonsson, 1996; Vallet, 2001; Whelan and Layte 2002). The present findings that indicate an increasing effect of education on earnings from the mid-1980s onwards suggest that such a conclusion seems premature. Insofar education is a good indicator of merits, we *do* observe 'increased merit selection' (or better, increased merit compensation). Also, others have shown that the impact of education on occupational outcomes increased, such as being employed or not (Breen, 1998), job level (Wolbers *et al.*, 2001), or income (Levy and Murnane, 1992; Bynner *et al.*, 2002).

Notes

1. A similar argument has been put forward by Juhn *et al.* (1993). They argue that economic developments during the recent decades called for types of skill that are, if at all, only loosely related to education. The rising wage inequality is not caused by increased returns to education, but by increased returns to other components of skill. Their argument is based on the fact that also within detailed educational groups income inequality has risen.

2. This also implies that educational differentials follow the same pattern as the aggregate income inequality, which is also often linked to technological developments. Income inequality in many Western societies, including Britain, follows a pattern of a 'great U-turn': first downwards, then upwards (Alderson and Nielsen, 2002; Harrison and Bluestone, 1988). The 'great U-turn' came after the 'Kuznets curve', which refers to an inverted U-shaped relation of income inequality with economic development. The total pattern, first upwards, then downwards, then upwards again, can be seen as a N-shaped pattern, which is found for a number of OECD countries (Alderson and Nielsen, 2002).

3. Besides time-varying education effects, there are more potential explanations for increased income inequality. For example, the wage bargaining structure affects wage inequality (Calmfors and Driffill, 1988), as well as globalization (Alderson and Nielsen, 2002). Also, it has been argued that active employment policies contribute to the reduction of *household* income inequality (Kenworthy and Pontusson, 2005). We don't have the space to capture this literature here fully, and we focus on perspectives on the role of schooling only.

4. More recently it was claimed that we should look at lifetime earnings rather than wages, which would match more closely to class positions (Goldthorpe and McKnight, 2003). However, this work has not shown that the anomaly in trends on social class and *lifetime* earnings vanishes.

5. Also Wolbers (1998) has shown, with Dutch data, that omitting father's occupation from the study of trends in the effects of education does not lead to a bias in these trends.

6. The British system of higher education has changed in the early 1990s. This restructuring implied that former polytechnics became universities offering degrees. This has perhaps deteriorated the average occupational outcomes of non-degree tertiary education (now excluding programmes that would formerly be given at polytechnics), as well as degree-level tertiary qualifications (that now include the programmes that were former polytechnic qualifications). However, in the current analysis results are not driven by these institutional changes. This was checked by analysing period trends for people born before 1956, for whom it is very unlikely to be educated in the new system. These trends were very much in line with the trends described in the current article.

7. We will only show fit statistics and unidiff parameters over time, as these tell us whether the overall association between education and social class has changed across time. The underlying pattern of odds ratios are available from the author upon request.

8. The trend in the effect of schooling on earnings septiles is also investigated with regression models in which the trend could vary between educational levels. The results are similar to what is found here. The results of these models are not shown here, but can be obtained from the author upon request.

Acknowledgements

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Appendix Table A1 Regression of logged hourly earnings on education, including trends in effect of education

	Model 1 women	Model 1 men	Model 2 women	Model 2 men
Age	0.014**	0.050**	0.014**	0.050**
	(0.001)	(0.001)	(0.001)	(0.001)
Age squared	−0.000**	−0.001**	−0.000**	−0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Period				
1972–1975	−0.156**	−0.069**	−0.071**	−0.047**
	(0.006)	(0.005)	(0.012)	(0.007)
1976–1979	−0.055**	−0.053**	−0.059**	−0.061**
	(0.006)	(0.005)	(0.011)	(0.006)
1980–1983 (ref.)				
1984–1987	0.057**	0.038**	0.056**	0.038**
	(0.006)	(0.005)	(0.010)	(0.006)
1988–1991	0.171**	0.127**	0.177**	0.130**
	(0.006)	(0.005)	(0.009)	(0.006)
1992–1997	0.204**	0.087**	0.207**	0.094**
	(0.006)	(0.005)	(0.009)	(0.006)
1998–2003	0.144**	0.008	0.138**	0.008
	(0.006)	(0.005)	(0.008)	(0.006)
Educational attainment				
O-level versus primary	0.217**	0.160**	0.196**	0.153**
	(0.004)	(0.004)	(0.010)	(0.009)
A-level versus O-level	0.165**	0.139**	0.127**	0.128**
	(0.007)	(0.005)	(0.026)	(0.014)
Higher education non-graduate versus A-level	0.244**	0.097**	0.362**	0.125**
	(0.008)	(0.006)	(0.028)	(0.017)
Degree level versus non-graduate	0.170**	0.224**	0.128**	0.191**
	(0.007)	(0.006)	(0.025)	(0.016)
1972–75 × education				
O-level versus primary			0.072**	0.030*
			(0.015)	(0.012)
A-level versus O-level			0.266**	0.059**
			(0.040)	(0.021)
Higher education non-graduate versus A-level			−0.344**	−0.025
			(0.044)	(0.025)
Degree level versus non-graduate			0.137**	−0.04
			(0.042)	(0.025)
1976–1979 × education				
O-level versus primary			−0.01	−0.001
			(0.014)	(0.012)
A-level versus O-level			0.038	−0.019
			(0.038)	(0.020)
Higher education non-graduate versus A-level			−0.107*	−0.014
			(0.042)	(0.024)
Degree level versus non-graduate			0.079*	0.022
			(0.038)	(0.023)
1984–1987 × education				
O-level versus primary			0.003	0.002
			(0.015)	(0.013)
A-level versus O-level			0.032	0.002
			(0.034)	(0.020)

(continued)

Appendix Table A1 Continued

	Model 1 women	Model 1 men	Model 2 women	Model 2 men
Higher education non-graduate versus A-level			−0.074*	−0.017
			(0.037)	(0.023)
Degree level versus non-graduate			0.011	0.001
			(0.033)	(0.022)
1988–1991 × education				
O-level versus primary			0.033*	0.003
			(0.015)	(0.014)
A-level versus O-level			0.053	0.007
			(0.032)	(0.020)
Higher education non-graduate versus A-level			−0.115**	−0.028
			(0.036)	(0.023)
Degree level versus non-graduate			0.029	0.060**
			(0.032)	(0.022)
1992–1997 × education				
O-level versus primary			0.021	0.001
			(0.014)	(0.013)
A-level versus O-level			0.023	0.03
			(0.030)	(0.018)
Higher education non-graduate versus A-level			−0.079*	−0.014
			(0.033)	(0.022)
Degree level versus non-graduate			0.051	0.054*
			(0.030)	(0.021)
1998–2003 × education				
O-level versus primary			−0.022	0
			(0.016)	(0.015)
A-level versus O-level			0.003	0.005
			(0.029)	(0.018)
Higher education non-graduate versus A-level			−0.207**	−0.089**
			(0.032)	(0.022)
Degree level versus non-graduate			0.104**	0.085**
			(0.028)	(0.021)
Constant	0.895**	0.498**	0.890**	0.498**
	(0.027)	(0.022)	(0.027)	(0.022)
Observations	105,747	130,877	105,747	130,877
R-squared	0.28	0.19	0.28	0.19

Standard errors in brackets.
*Significant at 5%; **significant at 1%.

Appendix Table A2 Regression of logged hourly earnings on education, including trends in effect of education and social class

	Model 3 women	Model 3 men	Model 4 women	Model 4 men
Age	0.011**	0.042**	0.011**	0.043**
	(0.001)	(0.001)	(0.001)	(0.001)
Age squared	−0.000**	−0.000**	−0.000**	−0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Period				
1972–1975	−0.084**	−0.064**	0.017	−0.033**
	(0.011)	(0.006)	(0.036)	(0.013)

(continued)

Appendix Table A2 Continued

	Model 3 women	Model 3 men	Model 4 women	Model 4 men
1976–1979	−0.056**	−0.069**	−0.016	−0.091**
	(0.010)	(0.006)	(0.034)	(0.013)
1980–1983 (ref.)				
1984–1987	0.050**	0.038**	0.109**	0.062**
	(0.009)	(0.006)	(0.030)	(0.013)
1988–1991	0.160**	0.134**	0.249**	0.179**
	(0.009)	(0.006)	(0.028)	(0.013)
1992–1997	0.200**	0.116**	0.253**	0.166**
	(0.008)	(0.006)	(0.027)	(0.012)
1998–2003	0.159**	0.051**	0.251**	0.111**
	(0.008)	(0.006)	(0.027)	(0.013)
Educational attainment				
O-level versus primary	0.154**	0.099**	0.160**	0.104**
	(0.010)	(0.009)	(0.010)	(0.009)
A-level versus O-level	0.059*	0.082**	0.064∗	0.088**
	(0.025)	(0.014)	(0.025)	(0.014)
Higher education non-graduate versus A-level	0.218**	0.060**	0.225**	0.071**
	(0.027)	(0.016)	(0.028)	(0.016)
Degree level versus non-graduate	0.079**	0.098**	0.090**	0.111**
	(0.024)	(0.015)	(0.024)	(0.016)
1972–75 × education				
O-level versus primary	0.071**	0.02	0.077**	0.014
	(0.014)	(0.011)	(0.015)	(0.012)
A-level vs. O-level	0.199**	0.038	0.207**	0.033
	(0.039)	(0.020)	(0.039)	(0.020)
Higher education non-graduate versus A-level	−0.275**	−0.027	−0.270**	−0.04
	(0.041)	(0.024)	(0.042)	(0.024)
Degree level versus non-graduate	0.121**	−0.022	0.097*	−0.037
	(0.040)	(0.024)	(0.041)	(0.024)
1976–1979 × education				
O-level versus primary	−0.009	−0.003	0.002	0.003
	(0.014)	(0.011)	(0.014)	(0.012)
A-level versus O-level	0.046	−0.026	0.054	−0.021
	(0.037)	(0.019)	(0.037)	(0.019)
Higher education non-graduate versus A-level	−0.112**	−0.01	−0.092*	−0.007
	(0.040)	(0.023)	(0.041)	(0.023)
Degree level versus non-graduate	0.075*	0.022	0.063	0.029
	(0.036)	(0.022)	(0.037)	(0.023)
1984–1987 × education				
O-level versus primary	0.002	0.003	−0.006	0.003
	(0.014)	(0.013)	(0.015)	(0.013)
A-level versus O-level	0.025	−0.001	0.017	−0.003
	(0.032)	(0.019)	(0.032)	(0.019)
Higher education non-graduate versus A-level	−0.05	−0.013	−0.064	−0.019
	(0.035)	(0.022)	(0.036)	(0.022)
Degree level versus non-graduate	0.014	0.006	0.004	−0.002
	(0.031)	(0.021)	(0.032)	(0.022)
1988–1991 × education				
O-level versus primary	0.019	0.008	−0.003	0.004
	(0.014)	(0.013)	(0.015)	(0.013)
A-level versus O-level	0.05	−0.004	0.037	−0.01
	(0.031)	(0.019)	(0.031)	(0.019)

(continued)

Appendix Table A2 Continued

	Model 3 women	Model 3 men	Model 4 women	Model 4 men
Higher education non-graduate versus A-level	−0.080*	−0.014	−0.101**	−0.025
	(0.034)	(0.022)	(0.035)	(0.022)
Degree level versus non-graduate	0.008	0.050*	−0.007	0.035
	(0.030)	(0.021)	(0.031)	(0.021)
1992–1997 × education				
O-level versus primary	0.008	0	−0.011	−0.009
	(0.014)	(0.013)	(0.014)	(0.013)
A-level versus O-level	0.033	0.02	0.028	0.009
	(0.028)	(0.017)	(0.028)	(0.018)
Higher education non-graduate versus A-level	−0.057	0.007	−0.058	−0.007
	(0.031)	(0.020)	(0.032)	(0.021)
Degree level versus non-graduate	0.021	0.027	0.012	0.004
	(0.028)	(0.020)	(0.029)	(0.020)
1998–2003 × education				
O-level versus primary	−0.033*	0	−0.049**	−0.02
	(0.015)	(0.014)	(0.016)	(0.014)
A-level versus O-level	0.031	0.008	0.021	−0.014
	(0.027)	(0.018)	(0.028)	(0.018)
Higher education non-graduate versus A-level	−0.146**	−0.064**	−0.162**	−0.086**
	(0.030)	(0.021)	(0.031)	(0.021)
Degree level versus non-graduate	0.053	0.083**	0.033	0.043*
	(0.027)	(0.020)	(0.028)	(0.020)
Social class				
I higher service versus II	0.248**	0.225**	0.186**	0.205**
	(0.007)	(0.004)	(0.025)	(0.012)
II lower service versus III	0.261**	0.105**	0.250**	0.081**
	(0.004)	(0.005)	(0.013)	(0.015)
III routine non-manual versus IV	0.492**	0.385**	0.524**	0.568**
	(0.009)	(0.007)	(0.026)	(0.019)
IV abc self-employed versus V	−0.553**	−0.497**	−0.662**	−0.707**
	(0.014)	(0.007)	(0.046)	(0.019)
V foremen, technicians versus VI	0.056**	0.089**	0.143**	0.093**
	(0.014)	(0.005)	(0.044)	(0.013)
VI skilled manual versus VII	0.066**	0.121**	0.046	0.130**
	(0.009)	(0.004)	(0.025)	(0.011)
1972–75 × social class				
I higher service versus II			0.125**	0.026
			(0.038)	(0.017)
II lower service versus III			−0.018	0.047*
			(0.019)	(0.019)
III routine non-manual versus IV			−0.121**	−0.350**
			(0.037)	(0.024)
IV abc self-employed versus V			0.094	0.371**
			(0.064)	(0.026)
V foremen, technicians versus VI			0.007	−0.006
			(0.060)	(0.019)
VI skilled manual versus VII			−0.006	−0.018
			(0.031)	(0.014)
1976–1979 × social class				
I higher service versus II			0.072*	−0.028
			(0.037)	(0.017)
II lower service versus III			−0.040*	0.016
			(0.019)	(0.020)

(continued)

Appendix Table A2 Continued

	Model 3 women	Model 3 men	Model 4 women	Model 4 men
III routine non-manual versus IV			−0.049	−0.272**
			(0.037)	(0.025)
IV abc self-employed versus V			0.06	0.292**
			(0.066)	(0.026)
V foremen, technicians versus VI			−0.042	−0.013
			(0.062)	(0.019)
VI skilled manual versus VII			−0.001	−0.026
			(0.032)	(0.014)
1984–1987 × social class				
I higher service versus II			0.048	0.045**
			(0.033)	(0.017)
II lower service versus III			0.026	−0.047*
			(0.018)	(0.022)
III routine non-manual versus IV			0.024	−0.073**
			(0.037)	(0.027)
IV abc self-employed versus V			0	0.111**
			(0.064)	(0.026)
V foremen, technicians versus VI			−0.048	0.011
			(0.063)	(0.020)
VI skilled manual versus VII			0.043	−0.015
			(0.038)	(0.017)
1988–1991 × social class				
I higher service versus II			0.066*	0.072**
			(0.031)	(0.017)
II lower service versus III			0.037*	−0.051*
			(0.018)	(0.022)
III routine non-manual versus IV			0.087*	−0.103**
			(0.037)	(0.027)
IV abc self-employed versus V			0.006	0.137**
			(0.061)	(0.026)
V foremen, technicians versus VI			−0.084	0.028
			(0.060)	(0.020)
VI skilled manual versus VII			0.056	−0.012
			(0.037)	(0.017)
1992–1997 × social class				
I higher service versus II			0.054	0.047**
			(0.029)	(0.016)
II lower service versus III			−0.011	−0.006
			(0.017)	(0.021)
III routine non-manual versus IV			−0.035	−0.101**
			(0.033)	(0.025)
IV abc self-employed versus V			0.141*	0.138**
			(0.057)	(0.025)
V foremen, technicians versus VI			−0.079	0.016
			(0.059)	(0.020)
VI skilled manual versus VII			0.043	−0.001
			(0.037)	(0.017)
1998–2003 × social class				
I higher service versus II			0.076**	−0.011
			(0.029)	(0.016)
II lower service versus III			0.033*	0.137**
			(0.017)	(0.021)

(continued)

Appendix Table A2 Continued

	Model 3 women	Model 3 men	Model 4 women	Model 4 men
III routine non-manual versus IV			−0.079*	−0.306**
			(0.034)	(0.026)
IV abc self-employed versus V			0.227**	0.397**
			(0.053)	(0.025)
V foremen, technicians versus VI			−0.162**	−0.063**
			(0.059)	(0.021)
VI skilled manual versus VII			0.05	0.014
			(0.043)	(0.017)
Constant	0.854**	0.595**	0.862**	0.577**
	(0.026)	(0.021)	(0.027)	(0.021)
Observations	105,747	130,877	105,747	130,877

Standard errors in brackets.
*Significant at 5%; **significant at 1%.