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**Social origin and the financial feasibility of going to university:
The role of wage penalties and availability of funding**

Abstract: The evidence on why students from lower social origin are persistently underrepresented in higher education (HE) suggests social, educational and economic factors all play a role. We concentrate on the influence of monetary costs/benefits and how these are influenced by social origin. In particular, we consider the effect of a class-based wage penalty in the labour market and, using evidence from a large-scale survey of Scottish students, we show how the greater financial constraints facing working class students affects the incentive to participate in higher education. Using a simple model of human capital investment, the low rate of working-class participation in HE is shown to be consistent with rational behaviour, i.e. weighing the monetary costs and benefits, participating in HE is a less attractive investment proposition for some students. We conduct simulations which suggest this could be mitigated by a generous income-contingent support.

Keywords: higher education, participation rates, social origin, investment, wage penalty, returns to education.

JEL codes: G12, H52, I22, I23, I24, J08

1 Introduction

The question of why it is that young people from lower socioeconomic groups fail to enter higher education (HE) in the same proportions as their counterparts from more affluent backgrounds is one which has perplexed UK academics and policymakers since the mid-1940s (David *et al*, 2008). There is a substantial body of literature from the UK and other developed countries which seeks to identify, with a view to removing, barriers to able young people entering, and benefiting from, HE. There have been, and continue to be, a plethora of policy initiatives which seek to promote participation in HE among working class children with the aim of increasing social mobility, alleviating poverty, increasing the skills base of the economy, increasing productivity, and other positive outcomes (for an overview see Gorard & Smith 2007, Moore *et al*, 2013, Torgersson *et al*, 2014). Despite this intensive academic and policy interest, the proportion of young people who go on to HE has increased only very slightly in that time. As recently summarised by the principal of Glasgow Kelvin College (Sherry, 2016, p.126):

These initiatives are led by dedicated professionals who are seeking to deliver change supported by others who populate management committees, steering groups and policy forums. However, despite twenty years of valuable work and effort it is difficult to identify any systemic shift in the nature of the university population and particularly at the research intensive higher education institutions (HEI's).

The proportion of HE students who come from the 20% most deprived neighbourhoods¹ (the measure used by the Scottish Government) has gone from 14.9% in 2004-5 to 15.9% in 2013-14. In England, the measure used, which is based on Free School Meals (FSM), has shown a small decrease in the gap between the proportions receiving and not receiving FSM aged 15 who are in full-time HE by aged 19, from 19% in 2005-6 to 17% in 2012-13 (BIS, 2015, Table 1, p. 4). The most recent figures (2012-13) show that the proportion of those who were receiving FSM aged 15 who go on to HE by aged 19 was 23% (BIS, 2015, Table 1, p. 4). Furthermore, those students from a working-class background that do attend HE are disadvantaged on average vis-à-vis their middle-class counterparts through disproportionately attending less prestigious institutions and courses (Britton *et al*, 2016, Sherry 2016). This class difference in HE participation is particularly frustrating as repeated studies of labour market data have found the average wage premia associated with

¹ See Dockery *et al* (2016) for a critical discussion of the appropriateness of different types of measures.

holding a degree to be positive (Walker & Zhu 2008, Montenegro & Patrinos 2014, BIS 2016). Therefore, on the face of it, obtaining a degree should be an important contributor to social mobility.

A range of economic and social barriers to the entry of young people into HE have been identified (Forsyth and Furlong, 2003). For example, it has been suggested that students are financially constrained (Ross & Lloyd, 2013) or that they incorrectly anticipate the benefits of HE (McGuigan et al, 2012). Recent work has emphasised prior learning as a bottleneck based on US and UK work showing a strong correlation between prior attainment and HE participation (Carneiro & Heckman, 2002, 2004, Chowdry et al, 2013).

We explore the hypothesis that students from working-class backgrounds shunning HE are behaving rationally as the expected payoff is simply not sufficient to justify the expenses involved. A priori, this notion is motivated by emerging empirical findings showing significant socioeconomic variation in the economic benefits of HE (Crawford & Vignoles 2014, Britton et al 2016, Hersbein & Bartik 2016, Laurieson & Friedman 2016). Using data from a Scottish Student Income, Expenditure and Debt study (Warhurst *et al*, 2009), hereafter referred to as the SIED data, we show that working-class students are at a financial disadvantage relative to their middle-class peers, although this is partially offset by existing policy measures. We show that working-class students face higher living costs and receive less income in cash or in kind from their parents and other family members than students from other socio-economic groups. Furthermore, we exploit the recent addition of a social origin variable to the Quarterly Labour Force Survey in order to identify the wage-penalty of working class graduates...

By combining results from the SIED data with estimates from the wider literature we apply standard investment appraisal methods to judge the feasibility of HE as an investment for students in different circumstances. This reveals large differences in the financial attractiveness of participating in higher education, depending on social origin. We regard this finding as compatible with other proposed explanations in the literature, such as the role of prior attainment, social factors or information problems, which can further diminish the appeal of studying for HE. However, the focus of this paper is on the financial costs and benefits of participating in HE and the data is not suitable for revealing the relative importance of these vis-à-vis other relevant factors.

2 Previous work on HE participation and social origin

The neoclassical model of choice provides a common underpinning to much of the economics research into participation in HE. Those making the choice are assumed to make the decision to engage in advanced study based on a calculation of the costs and benefits from doing so.

Using a simple, and commonly-applied, human capital approach (Becker, 1964, 1993) students are assumed to invest in their education to the extent that it will increase their overall lifetime earnings relative to the costs involved (direct and indirect costs and foregone earnings during study). In this model the decision to participate in additional education is analogous to that of investment in physical capital. The net present value of additional education NPV^e can be defined as the present value of the benefits, less the present value of the costs, so that:

$$NPV^e = \sum_{t=1}^n \frac{B_t^e}{(1+r)^t} - \sum_{t=0}^m \frac{C_t^e}{(1+r)^t}$$

where B_t^e represents the benefits of education at time t , C_t^e the costs and r the discount rate.

In conventional investment appraisal, only cash flows are considered, but Becker (1993) stresses that the human capital framework should be interpreted as allowing for non-pecuniary benefits. This stream of benefits stretches out over the n periods over which the additional education is expected to be useful and is discounted at the rate r . Similarly, the costs of education C_t^e can stretch over several periods (m), typically 3 or 4 years in terms of a standard undergraduate qualification. As before, these can in principle include both monetary and non-monetary costs.

This framework implies that the rational student would invest in education if the present value of expected additional benefits exceeds the present value of the costs, i.e. the net-present value of the investment is positive ($NPV^e > 0$). This implies that for those who decide not to pursue additional education the net present value of the education is negative or alternatively that there are other feasibility issues restraining choice, such as an inability to fund the studies. If capital markets and information are perfect and aptitude for study is randomly distributed across the population then we should see similar rates of participation across all social groupings.

Following this theoretical approach, the economics literature has often emphasised distinguishing between the practical issue of funding HE studies and the more pervasive issue of social origin influencing child development and aptitude. These perspectives are summarised by Carneiro & Heckman (2002, p. 705):

There are two, not necessarily mutually exclusive, interpretations of this evidence. The common interpretation and the one that guides policy is the obvious one. Credit constraints facing families in a child's adolescent years affect the resources required to finance a college education. A second interpretation emphasises more long run factors associated with higher family income. [...] Better family resources in a child's formative years are associated with higher quality of education and better environments that foster cognitive and noncognitive skills.

The contemporary empirical consensus is that differences in HE participation by social origin are largely explained by differences in prior educational attainment (Chowdry et al 2011, Carneiro & Heckman 2002). From this follows the policy prescription that in order to increase university attainment, earlier education levels need to be strengthened. This is articulated by Carneiro & Heckman (2004) who point out that in terms of school performance, children from different socioeconomic backgrounds tend to diverge over time – with those from lesser social origins typically falling behind. Whilst the correlation is clear, that does not automatically imply a causal relationship. As Chowdry et al (2011) caution, it is quite possible that school-level attainment is endogenous to anticipated participation in HE. For example, students expecting to attend HE would emphasise good grades to be better placed for university, whilst those not expecting to attend university might pursue other priorities. For example, many secondary schools offer young people the opportunity to attend FE colleges to take vocational qualifications as part of their school timetable. A young person who had already decided, for whatever reason, against proceeding to HE, may decide to follow a vocational route and thereby attain fewer academic qualifications. Expected university participation could in turn be influenced by a number of factors, such as family finances or the expected labour market benefits of participating in HE.

Looking specifically at the decision to invest in HE the human capital model suggests several reasons why the expected net present value of investing in additional education could be negative. Firstly, the cost of investing in education could simply be too high.

Indeed, the most intuitive of potential explanations for low working class participation in HE is that despite the availability of student loans and grants, students from lower socioeconomic backgrounds still struggle, or expect to struggle, to fund their studies. This issue is explored by Ross and Lloyd (2013) using the Longitudinal Study of Young People in England. Focussing on 16/17 year olds that were suitably qualified to enter university, a third of respondents reported that the financial aspects of going to university had led to them considering not applying. This figure was significantly higher (43%) for those in lower income households. In subsequent waves it emerged that the sub-section of students concerned about finances were twice as unlikely to go to university as those who had not reported financial concerns. However, the findings of Ross & Lloyd also suggest that financial concerns are not the only issue affecting participation: those reporting financial concerns also had lower attainment, were more likely to want to live at home, more likely to feel uninformed, more likely to expect to do paid work, less likely to receive financial support from family, less likely to feel a degree would lead to a better job, more concerned about debt and more likely to have cultural and social inhibitors against going to university.

Second, the additional expected benefits of education could simply be too low. Indeed, Delaney *et al* (2011) found earnings expectations among Irish HE students to be influenced by social origin with a difference in expected maximum earnings of €2,241 per year of additional parental education, which is 2% of the mean. Parental education is not a precise indicator of class but it could be considered as a proxy. It has been proposed that the lower graduate earnings expectations among children from lower socioeconomic backgrounds reflects an information problem that can be alleviated by providing information on the benefits of HE (McGuigan *et al*, 2012). However, it may also be the case that students from lower socioeconomic backgrounds are simply accurately predicting a weaker outcome for themselves.

Looking at pecuniary benefits it has been widely observed that wage premia associated with education are high and positive on average (Psacharopoulos & Patrinos, 2004; Walker & Zhu, 2008; Montenegro & Patrinos, 2014). However, the magnitude of wage premia can vary over time, across regions, by gender, by ethnicity/race and, crucially, by class (Crawford & Vignoles, 2014; Britton *et al*, 2016 Laurieston & Friedman 2016).

Crawford and Vignoles (2014) find that 3.5 years after graduation UK graduates from a routine social origin earn 5% less than those from a managerial background. Their model also includes a control for coming from a low participation neighbourhood which further penalises earnings by another 5%. Britton *et al* (2016) use tax, student loan and HESA (HE

Statistics Agency) data to examine the labour market outcomes of a large cohort (260,000) of English graduates ten years into their labour market experience. They find that even after taking into account institution attended and degree taken, students from the top 20% of households in terms of family income earn on average about 10% more than other graduates.

Furthermore, there are a number of international studies, which find evidence of a negative link between social class and labour market outcomes of graduates (Menon *et al*, 2012; Bartik & Hersbein, 2016; Hällsten, 2010). Laurieston & Friedman (2016) refer to this as a ‘class ceiling’ on account of similarities with the gender pay gap. If potential entrants to HE form expectations about the return to education based on the experience of people in their social networks, with whom they share their own class position, such estimates may more accurately reflect the constrained reality of their future labour market experience than averages based on data from large scale surveys.

In addition to wage premia there are non-monetary benefits to education, which have been suggested to be at least as valuable as those obtained in the labour market (McMahon, 2004). Probably the most important of these is improved own health, but a range of effects have been explored in the literature, including longevity, child health, child education, spouses health, happiness, job and location amenities (for an overview, see Oreopoulos and Salvanes, 2011 and McMahon, 2009: Chapter 4). However, it is unclear to what extent these are factored into individual's decision about education and if these expectations differ across social classes.

Thirdly, non-investment could occur if the discount rate is too high, reducing the importance of deferred benefits. As Becker (1993) points out it is difficult to collateralise human capital and therefore capital constraints are likely to play a role, particularly for people from lower SES backgrounds who are likely to have less access to intra-family financing (as is suggested by our survey evidence presented in Fig 3). Furthermore, as summarised by Becker (1993) there is significant individual-level uncertainty about the benefits of education in terms of how big a benefit it will deliver and for how long, as individually we do not know how long we will live, even if expected values can be derived for the population as a whole. This risk needs to be reflected in the discount rate. Indeed, recent evidence suggests the variation of graduate outcomes has increased with more participation in HE (Walker & Zhu, 2008), suggesting it is a riskier investment than before. Furthermore, there is evidence that discount rates are correlated with social class and higher for people from lower SES backgrounds (Lawrance, 1991).

As the preceding summary indicates, a significant evidence base is emerging that shows how social origin influences financial aspects of participating in higher education, graduate labour market outcomes and expectations thereof. However, it is not clear how these issues combine to affect the financial feasibility of HE participation by social class and in turn the participation rates of people from different social classes – a lacuna we try to fill.

3 Income, expenditures and expectations of students

The SIED survey was commissioned by the Scottish Government in 2007 and the construction and analysis was carried out by a multi-disciplinary team of researchers based at the Universities of Strathclyde and Glasgow. The construction of the final data set was the primary responsibility of one of the present authors and full details of the survey and the sampling and weighting strategy can be found in the final report (Warhurst et al, 2009). The main survey was completed by 4,331 full-time HE students 521 part-time HE student and 114 full-time Further Education (FE) students spread across 19 HE institutions and 26 FE colleges for the academic year 2007-8. All details of the response rates are included in the final report². The survey was weighted separately by age and sex for the four subgroups: FT HE (degree and sub-degree), PT HE and FT FE using population data from HESA (Higher Education Statistical Agency) and FES (Further Education Statistics). A separate sample was constructed by the SQA (Scottish Qualifications Authority) and which consisted of young Scots with two or more Highers (i.e. making them eligible for degree entry). This control survey had a much lower response rate and the final data set consisted of 277 students and 90 non-students. The survey collected detailed information on all sources of income, all types of expenditure and levels and sources of debt together with information on personal circumstances, family background, attitudes and behaviour. It is still the most up-to-date information of its type as it has not been repeated. The final SIED report concentrates mainly on the results by student type (HE/FE and FT/PT) with only some results broken down by class. Here the data on class is interrogated in more detail. Social class is defined in terms of the occupational classification of the parent (the higher of the mother or father) as an indicator of class. Specifically we define SOC Codes 5-9 as working class.

² In summary, out of a total population of 160,000, 9,181 completed the screening survey and, of that, 5,314 (58%) completed the main survey which was further reduced to 4,965 after the removal of outliers and part-time FE students, of whom only 36 completed the main survey. Calculating non-response rates was complicated by the fact that the precise number of students contacted in the FE colleges is not known. At the time, not all students in FE colleges were contactable by email and this was the method used to distribute the screening and main survey.

3.1 Returns to HE: expectations

The SIED data is consistent with the relationship between background and expected earnings as described in Section 2. When asked what salary they expected on graduation (at a time when the average graduate starting salary was £20,354) there appears to be a negative relationship (significant but not large) between social origin and expected salary. Figure 1 is based on annual salary bands going from £12,000 to £32,000 and above in £4,000 intervals. In the salary band 24,000 – 27,999 i.e. just above the average graduate starting salary there is a strong and significant underrepresentation of working class students who expect to earn this on graduation. Whether earnings expectations are revised once they have contact with the labour market is not known, but any impact is likely to be felt at the point when they make the decision about whether to study or not.

Figure 1 about here.

3.2 Affordability

The SIED data showed that working class students had higher (recorded) income, higher expenditure as well as higher debt and higher commercial debt relative to middle-class students. Middle-class students often report higher expenditure than income which suggests that informal income is under-reported. Working class students are equally likely to work and earn similar rates of pay but, crucially, they work over two hours more per week than their middle-class colleagues, in circumstances where all students are working in excess of the 10 hours recommended per week (Cubie, 1999). Term time work has been shown to have a negative effect on social integration at university (Rubin & Wright, 2017) and on academic outcomes (Curtis and Shani, 2002; Callender, 2008).

In Figure 3 we present some of the indicators of financial distress uncovered in the survey. There are a large number of financial distress variables and only some representative ones are reported here. Using data from the survey we show that fewer working class students report having access to informal loans from family or friends; a larger share of working class students reported that the availability of funding affected their decision to study and also that they have less money than meets their immediate needs.

Figure 2 about here.

When we consider the control group of suitably-qualified non-students we find that they are almost all in employment (most of them full-time). On some indicators they seem better off than the cohort of students in that a larger proportion of them say they could borrow £50 and then £500 if they really needed to. However, that may be precisely because they are in full-time employment and we do not know what their answer would have been had they entered HE. However, when asked directly whether they had considered HE and decided against for financial reasons 39% of middle-class respondents and 49% of working class respondents said yes. When asked if they had started a HE course and had to abandon it for financial reasons, 9% and 19% respectively indicated that they had. These figures have to be treated with some caution given the very small size of the sample and are shown here for illustration. The ability to access a bigger control survey in future could mitigate the selection bias inherent in this type of study.

Figure 3 about here.

4 HE participation as an investment decision

The simple investment model introduced in Section 2 can be applied to appraise the expected monetary returns from participating in HE. This analyses the decision from the perspective of a hypothetical, forward-looking, individual basing their decision on all publicly available information, in similar fashion as a professional investor. From the review of the literature in Section 2 it is clear that a variety of factors play a role, but an investment appraisal of this type provides an upper bound in terms of the feasibility of investing in education from a monetary perspective, if information problems and wider social issues were not interfering. This is also a useful way to synthesise the wide range of available evidence bearing on different aspects of this decision, obtained from disparate sources. As we shall see, the evidence base is sufficiently rich to construct scenarios for students from different social origins. Three key variables affect the feasibility of the investment, the expected monetary costs (C^e) the expected monetary benefits (B^e) and the discount rate (r). All of these can be influenced by social origin. We shall explore scenarios based on a hypothetical individual representative of the average for each of middle class and working class students.

4.3 Cost of a degree

The simplifying assumption is sometimes adopted that the whole of annual earnings represents the opportunity cost of being a student. However, as borne out in the SIED data there are several moderating factors that need to be considered. These numbers are summarised in Table 1.

Table 1 about here.

The average participant in the SIED control survey (non-students) earned a wage income of £8,409 in a time period equivalent to term time (their annual earnings were £13,531). The earnings of those from a working class background were slightly higher at 8,714 whereas middle class students earned £7,902. However, not all of this can be interpreted as the opportunity cost of studying as at the same time the average student earned £1,945 during term time and received various subsidies, both formal and informal. This leaves a residual of £4,682 on average, which we interpret as the individual opportunity cost of studying for one academic year. This varies by social origin: £4,914 per academic year for a student from a working class social origin, which is higher than the £4,270 for those from middle class backgrounds. This is due to the fact that the expenditures of working class students are higher (they are older on average and more likely to live independently and have dependants (see SIED Report, Chapter 3, pp. 55-87, for further detail) and they receive fewer informal subsidies. However, this is partially offset by higher formal student support than for middle class students (£935 vs £539).

4.4 Cost of funding a degree

A common practice in investment appraisal is to calculate the Weighted Average Cost of Capital (WACC) for the financing of a particular project and use as the discount rate (see e.g. Benninga 2014 for details). A simple calculation for the WACC of different student groups can be carried out using publicly available information and estimates from the literature (see Table 2). First of all, from the SIED report we calculate the share of the opportunity cost of studies funded through student loans. Furthermore, we know by comparing the expenditures of students and the non-student control group that much of the loss in income is financed simply by abstaining from consumption. On average this comes to 44%. We adopt a 13% time preference rate for all groups following experimental evidence based on American data (Lawrance, 1991). The implicit cost of such funding is

influenced by age, race, education and social class, from 10% to the most privileged to 19% for the least privileged. However, it is difficult to map these findings onto social classes in the UK therefore for simplicity we adopt the baseline estimate for all groups. The remainder needs to be funded through other means. We assume this is funded through access to commercial credit. There are a wide range of options available to students in the credit market. At the higher end, price comparison sites are replete with credit cards in the 30%-50% APR range, which in turn is dwarfed by the rate offered by institutions such as pay day lenders. However, we assume that students are financially savvy and are able to access competitive credit at a rate of 5.9% in line with student funding offers currently available³.

Table 2 about here.

4.5 The graduate wage premium

We estimate the wage premium associated with obtaining a degree using a model based on Mincer (1974), where the logarithm of hourly wages are fitted onto the level of qualifications, a quadratic term for experience (proxied by age) and a vector of controls. We follow a similar approach to Walker & Zhu (2007) who provide an accessible overview of the methodology. The data used is the Quarterly Labour Force Survey (LFS) for July-September 2014, carried out by the UK Office for National Statistics⁴. As we are interested in the labour market benefits of education from the perspective of those deciding on investment in higher education, we restrict our sample only to those with requisite academic qualification to study for a degree and above (those with vocational qualifications are excluded). This yields a restricted sample of 4,566 individuals. Following convention in UK labour market research (see for instance Walker & Zhu 2007) qualifications are attributed to particular NVQ levels, where NVQ3 represents advanced secondary qualifications requisite for matriculation into higher education. NVQ4 represents degree and sub-degree higher education qualifications and NVQ5 represents post-graduate qualifications. Our regression contains coefficients for NVQ4 (NVQ4academic) and NVQ5 (NVQ5academic), whereas NVQ3 is omitted as a reference category. Social classes are

³ For an overview of the market, see for example: <https://www.moneyguru.com/compare/credit-cards/>

⁴ This is the first wave of the LFS that includes information on social origin. Unfortunately this doesn't coincide with the data year of the income/expenditure data. However, we are not using the LFS to inform levels of wages, but ratios between different groups so this should not be affected by price level changes. Similarly, it is reasonable to assume that a class wage penalty was already in effect in 2007/8 as contemporary wage premia analysis had already identified a polarisation of graduate outcomes, e.g. Walker & Zhu (2008).

defined in the same way as in the analysis of the SIED data in the previous section. SEC classifications are roughly split in half and a dummy variable (SEClow) used to represent those aligned to levels 5-9 of the National Statistics Socio-economic Classification. Controls are included for gender (SEX), disability (DISABILITY), visible minorities (VISMIN), public sector workers (PUBLICSECTOR), as well as those living in Scotland (SCOTLAND) and the South East of England (SOUTHEAST).

Table 3 about here.

As demonstrated by the regression output in Table 3 above, the wage premium associated with an undergraduate degree is approximately 24%. The coefficient for low social origin is approximately -11%. This suggests, the wage premium for the average graduate from a low SES background could be closer to 13.5%. Conversely, we should note that we are only looking at the "college wage premium" i.e. the difference between graduates and those eligible to enter HE and therefore don't have any information on class pay gaps at other education levels. To obtain the absolute value of the annual wage premium we multiply the wage premia for each group with the annual earnings of non-students in the same group (as revealed by the SIED survey).

4.6 Estimates for graduates' return on investment by social origin

The parameters and results of our investment appraisal are summarised in Table 4. The internal rate of return (IRR) suggests HE is a robust investment proposition in monetary terms. The average students sees an IRR of 12.2%, whilst there is some socioeconomic variation with working class students experiencing an IRR of 8.4% and middle class students of 14.8%. However, when gauged in terms of the NPV the working class students show a far less impressive outcome than middle class students, albeit still positive. It is clear that official student support, such as income support and student loans, benefits working class students. Indeed, if working class students faced the same cost of funding as middle class students, the IRR would only be marginally larger than the WACC and hence NPV would be very close to zero. However, this is not sufficient to fully offset the advantage middle class students have in terms of informal student support and, more crucially, better labour market prospects.

Table 4 about here.

Naturally, the analysis presented here provides averages for particular groups in a particular context at a particular time and it goes without saying that in reality there will be a distribution of individual circumstances clustered around such averages. Therefore, it is not unreasonable to expect that for many working class students individual circumstances will be slightly less favourable than for the group on average, therefore rendering higher education financially infeasible, despite the absence of student loans in Scotland.

4.7 Simulations

Drawing on the baseline calculations set out above we can explore the impact of changes in circumstances and policy upon the feasibility of investing in education. We explore, in turn, three scenarios as step-by-step increases in: the availability of student bursaries; the wage premium working class students can expect; and the availability of student loans.

The impact of bursaries is summarised in Table 5. Columns 2 and 3 show for comparison the baseline results for students from middle class and working class social origins, respectively. The remaining columns show a stepwise increase the amount of bursaries obtained by the average working class student. This represent an increase in direct subsidy and therefore reduces the opportunity cost per academic year. This goes from £4,914 in the baseline to £3,979 in the ultimate case, where bursaries have doubled. This more than doubles the net present value of the labour market benefit of a degree, but still leaves a significant gap vis-à-vis middle class students. To obtain an equivalent net present value as middle class students would require the level of bursaries to be more than tripled.

Table 5 about here.

Table 6 shows the impact of an increase in the average expected wage premium for working class students. The ultimate result of this simulation is a near total elimination of the class based wage penalty (far right column). Interestingly, this would lead to higher education being more attractive to working class students than middle class students, as we assume they would maintain preferential treatment in terms of access to bursaries and student loans.

Table 6 about here.

Table 7 shows the impact of increasing the total amount of student loans available to working class students, thereby reducing the funding cost of studies. The estimated baseline cost of capital is 7.3% but if the maximum amount of student loans available were to double this would reduce funding costs to 4.7%. This would drastically reduce the gap in the expected net present value between working class and middle class students, but fail to eliminate it completely. Debt aversion could, of course, partially offset any positive impact on HE participation of increasing the level of student funding to working class students. This effect will be stronger the higher is debt aversion for working class students – a possibility that requires further investigation.

Table 7 about here.

5 Conclusions

This paper re-examines the debate on why there is a persistent gap in participation rates between people from different social origin. Whilst it is clear from the evidence that this is a complicated issue, we seek traction by focussing on a sub-question in this conundrum: whether education is a feasible investment from purely a monetary perspective and whether this varies by social origin. We re-examine data from a comprehensive income expenditure study of Scottish students (Warhurst *et al*, 2009). This clearly shows that socioeconomic background influences the expected benefits of participating in HE and the financial strain experienced by students, with working class students expecting fewer benefits as graduates and expressing greater financial stress. The data shows that this is the case despite working class students having better access to grants and student loans and in a system where there are no tuition fees. Recent evidence suggests that working-class graduates receive a lower return to HE than their higher SES peers. Using the Quarterly Labour Force Survey we estimate an 11% working class wage penalty. This amounts to nearly a half of the average wage premium enjoyed by middle class graduates. We have not considered here additional sources of pay penalty such as sex, ethnicity and disability. It is not clear how the combination of these characteristics in an individual would impact on their overall wage premium. The possibility certainly exists that such effects would be reinforcing resulting in even lower returns to HE.

We conducted an investment appraisal for a four-year undergraduate degree, combining data on income, expenditures, financing and the wage premia of students. This reveals far more favourable returns for middle class students than working class students. This is primarily driven by differences in the wage premia that can be expected for different groups. This is partially off-set by working class students' better access to student bursaries and loans, but middle class students benefit from more informal financial support, e.g. from parents. We simulate the impact of increases in student support and availability of student loans. Bursaries would need to increase by a factor of 3.5 to fully offset the disadvantage of working class students and the availability of 100% student loan funding comes close to achieving this. We further show that if working class students faced no wage penalty, they would, other things being equal, be better off going to university than middle class students, given their better access to bursaries and student loans.

Whilst we have good data on income, expenditures and composition of student funding we have limited information on the cost of credit channels available to different groups of students. For this we have had to borrow parameters and assume uniform parameters for both groups. This is likely to understate differences between social groups.

On balance, the results suggest that it can be an economically rational decision for some working-class young people to forgo participation in HE. From the point of view of the wider debate on HE participation this shows that basic pecuniary costs and benefits contribute to differences across social classes. The influence of non-pecuniary costs and benefits is likely to exacerbate these differences. Indeed the SIED data also revealed more middle class students expect to benefit from a degree in terms of non-pecuniary benefits such as choice of jobs, employment conditions, social lives, control over work and job satisfaction. Furthermore, previous sociological work has identified a range of non-pecuniary barriers experienced by working class students.

As mentioned above, we do not focus here on differential attitudes to debt across social classes. This is clearly another potential explanation of why working class students may choose not to go on to HE and it therefore requires further investigation. The possibility of the cost of credit varying across different social classes is another factor which requires further analysis as does the interaction of different characteristics (sex, ethnicity, disability etc) on the total wage premium of a given individual.

Levelling socioeconomic gaps in attainment at earlier stages of the school system is a worthwhile project in its own right. However, it is doubtful this will suffice on its own to redress the socioeconomic gap in HE participation, unless it will also act to alleviate class-based wage penalties, which is highly uncertain. Furthermore, levelling socioeconomic gaps in school attainment is likely to take a long time and, in the interim, standard public policy tools such as income-contingent grants, which would alter the terms of the investment decision, could be usefully applied to address needs of young students now and thereby reduce that part of the HE participation gap attributable to the causes posited here.

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Figure 1 Distribution of earnings expectations by social class (N=4794)



Figure 2 Affordability indicators by social origin (N=4795).

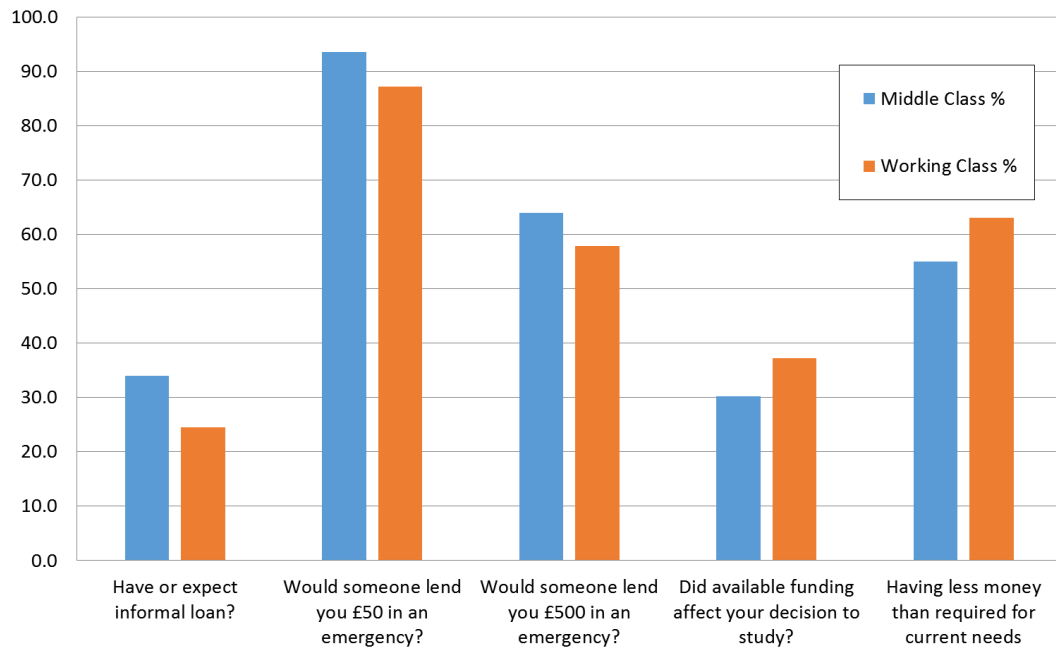


Figure 3 Control group: Affordability indicators by social origin (N=4795).

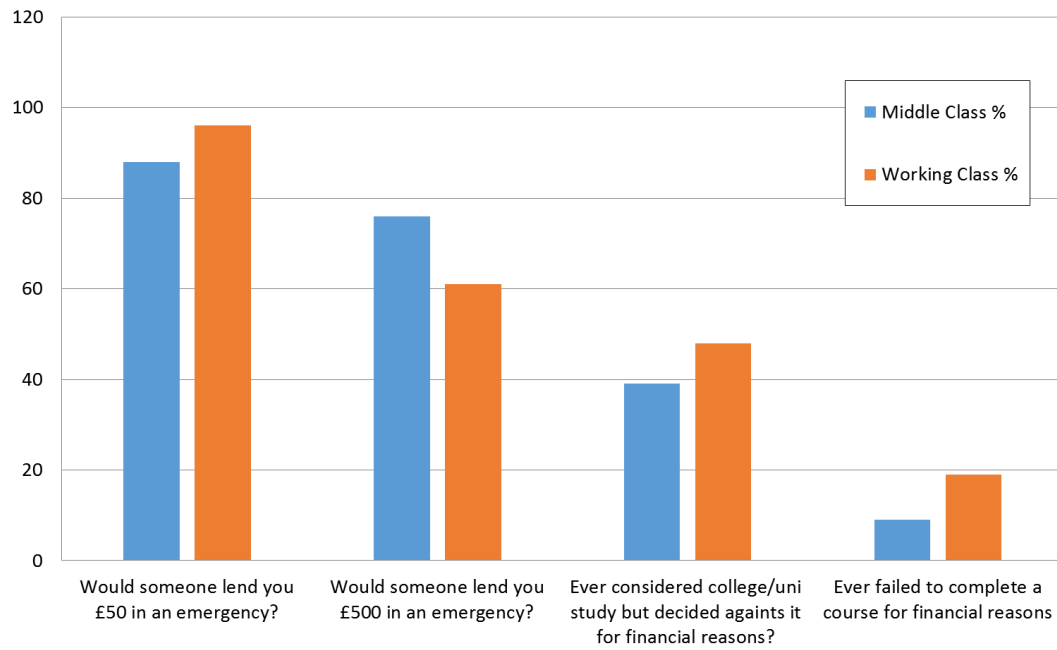


Table 1 Opportunity cost of studying for an academic year by social origin.

		Average	Working class	Middle class
Wage income of non-student comparison group (term time equivalent)	+	8,409	8,714	7,902
Household transfers	-	453	268	623
Term time earnings	-	1,945	2,052	1,914
Grants and bursaries	-	759	935	539
Other income (including benefits)	-	570	545	556
Opportunity cost of studies	=	4,682	4,914	4,270

Table 2 Sources of student funding by social origin.

	Average		Working class		Middle class	
	% of funding	% rate	% of funding	% rate	% of funding	% rate
Student loan	31%	1.5%	33%	1.5%	28%	1.5%
Reduced consumption	44%	13%	41%	13%	49%	13%
Commercial credit	25%	5.9%	26%	5.9%	23%	5.9%
WACC	100.0%	7.7%	100.0%	7.3%	100.0%	8.1%

Table 3 Wage premia associated with higher education qualifications.

Variable	Coefficient	Standard error
AGE	0.082 ***	0.004
AGE2	-0.001 ***	0.000
SEClow	-0.108 ***	0.018
NVQ5academic	0.399 ***	0.024
NVQ4academic	0.243 ***	0.020
SEX	-0.208 ***	0.015
DISABILITY	-0.108 ***	0.025
VISMIN	-0.133 ***	0.024
PUBLICSECTOR	0.039 *	0.016
SCOTLAND	0.002	0.026
SOUTHEAST	0.171 ***	0.017
_cons	0.917 ***	0.081
N	4566	
R-squared	0.2946	

*** (**, *) indicates statistical significance at the 1%, (5%, 10%) levels.

Table 4 Estimated NPV and IRR of investing in a 4 year honours degree for students of different social origins.

	Average	Working class	Middle class
Opportunity cost	£4,682	£4,914	£4,270
Average wage premium %	20%	20%	20%
Average annual wage premium £	£2,762	£1,934	£3,156
WACC	7.7%	7.3%	8.1%
Years of studies	4	4	4
Expected time in labour market	44	44	44
Net Present Value (NPV)	£10,032	£2,487	£13,462
Internal Rate of Return (IRR)	12.2%	8.4%	14.8%

Table 7 Impact of a simulated increase in availability of student loans for the financial returns to higher education for students from working-class social origin.

	Baseline estimate: middle class	Baseline estimate: working class	WC +20% Student Loan	WC +40% Student Loan	WC +60% Student Loan	WC + 80% Student Loan	WC + 100% Student Loan
Opportunity cost per academic year	-4,270	-4,914	-4,914	-4,914	-4,914	-4,914	-4,914
WP	0.243	0.135	0.135	0.135	0.135	0.135	0.135
Annual benefit	3,156	1,934	1,934	1,934	1,934	1,934	1,934
NPV	£13,461.97	£2,486.95	£3,936.24	£5,594.64	£7,497.91	£9,688.92	£12,219.30
IRR	14.8%	8.4%	8.4%	8.4%	8.4%	8.4%	8.4%
WACC	8.1%	7.3%	6.8%	6.3%	5.7%	5.2%	4.7%