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University tuition fees for undergraduates were abolished in Ireland in 1996. This paper examines the effect of this reform on the socio-economic gradient to determine whether the reform was successful in achieving its objective of promoting educational equality that is improving the chances of low socio-economic status(SES) students progressing to university. It finds that the reform clearly did not have that effect. It is also shown that the university/SES gradient can be explained by differential performance at second level. Students from white collar backgrounds do significantly better in their final second level exams than the children of blue-collar workers. The results are very similar to recent findings for the UK. The results show that the effect of SES on school performance is generally stronger for those at the lower end of the conditional distribution of academic attainment.

Keywords: tuition costs, university, fees, socio-economic background, educational attainment
JEL: codes: I21,I22

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1.Introduction

The transition from secondary to higher education is an important milestone for an individual and one that generally brings substantial financial and other benefits. Understanding the barriers to making this transition is therefore important and has been widely studied by economists and others. The potential rôle of tuition costs is important because it is an instrument that governments can seek to manipulate.

This paper is concerned with one large reform to tuition costs in an economy, Ireland, where there has been a longstanding concern that people from a low socio-economic status (SES) background are heavily under-represented in higher education in general and universities in particular. This has been well established in several official reports for example Clancy (1988, 2001) and most recently O'Connell *et al* (2006). This generates a high inter-generational correlation in educational attainment and clearly constrains social mobility. Leaving aside concerns about equity, it also implies an efficiency loss to the economy. The educational immobility between generations in Ireland is high relative to many other countries: in a cross-country study of inter-generational educational mobility using data on OECD countries Chevalier *et al* (2009) find that the association between education levels of individuals and their parents was highest in Ireland[1]. While the scale of the problem is well known, there is a lack of research which establishes why low SES groups do not progress to higher education. There are some qualitative studies on the subject as well as numerous policy evaluations and reviews[2]. However these cannot (nor do they claim to) establish what the causal mechanisms behind educational disadvantage are, still less to quantify them. Hence they are of limited assistance in the design of policy.

That said, the government operates several programs to deal with educational disadvantage in schools under the heading "Delivering Equality of Opportunity in Schools" (DEIS). These

[1] Using a different methodology and different data, Asplund *et al.* (2008) also find that for a subset of OECD countries the association between higher education and parental education is highest in Ireland. Throughout the paper, references to Ireland exclude Northern Ireland which is part of the United Kingdom.

[2] For example Lynch & Riordan (1996), Osbourne & Leith (2000), Department of Education & Science (2001, 2003).

programmes provide differential support to schools that have been designated as disadvantaged. The effects of these programs have not in general been studied using methods that would allow one to infer whether they have been effective or not.

This paper examines one of the most significant changes to higher education in Ireland in recent decades, the abolition of undergraduate university fees for Irish and EU students in 1996. To understand the consequences of this reform it is also instructive to examine the factors which predict academic success at secondary level, specifically in the national exams taken by students who remain in school until the end of the secondary system.

In the absence of previous comparable studies for Ireland, it is worthwhile looking at the international literature. The effects of SES on access for higher education and the impact of changes in educational financing are two of the most widely studied questions in the economics of education. There is, not surprisingly, a wide range of findings which are difficult to summarize succinctly. In an influential study Carneiro & Heckman (2002) find that only a small proportion (around 8%) of US school leavers were credit constrained when it came to attending higher education. Applying the same methodology to UK data, Dearden *et al.* (2004) also find that credit constraints are comparatively unimportant. So these papers would tend to suggest that it is long run factors that are important and hence changes in tuition costs are unlikely to be important. Using a different approach, a recent study for the UK, Chowdry *et al.* (2010) finds that most of the differences in participation in higher education across socio-economic groups can be explained by school attainment. In a Canadian study, Levin (1990) finds that a policy of low tuition fees has not resulted in substantial changes in the composition of the university population though a more recent study finds for Canada found that increases in tuition costs has substantial negative effects on enrolment, see Neill (2009). Recent evidence for Denmark suggests that student aid has a small effect on student enrolment; see Nielsen, Sørensen and Taber (2000).

However this is not to imply money does not matter in general. A review of US studies, by Deming & Dynarski (2009), finds that financial aid to students can be effective at increasing participation at (& retention in) university depending on how the programme is designed. So it is far from clear, *a priori*, what to expect from the abolition of university fees and it will, in general, depend on local circumstances and institutions.

2. Institutional Background

The Irish educational system consists of six years of primary school (often preceded by two years of pre-school) followed by secondary school which lasts five or six years. After three years of secondary school (usually at the age of 15 or 16), students take the Junior Certificate, a nationwide exam, usually in 8 or 9 subjects. A fairly small proportion of students leave at this stage[3]. The senior cycle of secondary school, leading the Leaving Certificate is usually completed in three years. It is a baccalaureate type exam. The students' grades on the best six subjects are summarized in a single points score with a maximum of 100 points per subject for a possible maximum of 600 points.

Application to universities in Ireland is through a centralized clearing house, the Central Applications Office (CAO). Students make one application on which they list their top 10 choices of degree programme. This application is made in the final year of secondary school and before they take the LC. Offers for a place on a particular course at a particular university are made to the highest scoring students who applied for that course at that university as their first preference.[4] Further offers are made on the basis of grades until all places have been filled – some students will turn down their initial offers. Students who are not offered their first ranked course are then considered for their second ranked course and the process continues until all places are allocated. As the number of students applying for places generally exceeds the supply the system is characterized by a high level of excess demand and particularly for more prestigious courses.

Figure 1 graphs the total number of applications made for higher education courses made via the CAO. From 1979 to 1990 (inclusive) only applications for degree courses in universities were made through the CAO. For these years one can see that the number of applicants is a multiple of the number of acceptances (which is essentially the number of places available). Not all students who apply will subsequently achieve the minimum points required to enter

[3] The "retention rate", the proportion of the cohort which starts secondary school and remains to take the Leaving Certificate, has risen steadily since the 1960s. In 1960 the rate was 20% and was about 75% in 1995. Thereafter, growth has leveled off at just over 80%, see Department of Education (2008) Figure F.

[4] Details of the scoring system are at www.cao.ie/index.php?page=scoring. As of 2009, entrance to medical schools depends also depends on an aptitude test.

university so that actual excess demand may be somewhat less that the gap between the number of applications and the number of acceptances. Nevertheless, the basic picture would not be changed if one allows for this. After 1990, the CAO also dealt with applications for degree and non-degree (i.e. diploma) courses in non-university institutions hence the increase in both the number of applications and acceptances. While this complicates the picture somewhat the basic fact, of a high level of excess demand for higher education places, is unchanged.

The minimum level of points required to enter particular programs varies widely both across subject and, to a lesser extent, across institution. To enter medicine (or veterinary medicine) in any university typically requires around 570 points, business, law and engineering degrees are usually in the 440-520 range with humanities and social sciences in the 330-400 range. In general it does not matter through which LC subjects a student acquires their points: it is simply the total that counts although some programmes, like Engineering and Medicine, require minimum levels of attainment in some LC science subjects such as mathematics.

There are seven universities in Ireland as well as a medical school, the Royal College of Surgeons in Ireland (RCSI). There are fourteen institutes of technology and almost twenty other specialist higher education institutions including teacher training[5]. In 2004 the universities and institutes of technology accounted for 47.3% and 41.9% respectively of new entrants to higher education[6]. This paper is concerned only with entrance to the universities as they form a distinct group. Institutes of technology provide a diverse range of courses in more vocational areas and award a mixture of degrees, diplomas and other certification. Some, but not all, students enter the institutes of technology through the same centralized clearing house as the universities.

The government operates a Higher Education grant scheme, administered by local governments, which provides a means tested benefit to students attending higher education. Prior to the abolition of fees, it covered fees and a contribution to living expenses. These grants were available for both undergraduate and postgraduate study. There are four levels of financial aid which are contingent on parental income, the number of dependent children

[5] See O'Connell et al. (2006) figure 1.3 p.17 for a list.

[6] ibid Table 2.1 p.22. In the period which this paper studies, the mid-1990s, the relative proportions were similar.

in the household and distance from university. There are two levels of aid, an "adjacent rate" if the student lives within 24 kilometres of the university/institute and a "non-adjacent rate" if they are further away. The latter is 2.5 times the adjacent rate. The income thresholds are revised periodically to take account of inflation as are the levels of maintenance grant.

When considering the effects of any reforms to higher education in Ireland it needs to be borne in mind that the system has expanded considerably and fairly steadily in recent decades. In 1980, 20% of those at school leaving age were admitted to higher education. By 1992, this had risen to 36% and had reached 54% by 2003. The growth has now tapered off considerably[7]. This growth in numbers is a consequence of a policy of expanding the numbers of places, see Figure 1 for example.

In 1995, the government decided to abolish undergraduate fees for Irish and other EU students, although students doing part-time degrees were still liable for fees. The reform is generally referred to as the "free fees" initiative. Fees were cut by 50% in 1995 and eliminated thereafter. In addition a tax covenant scheme whereby family members of fee paying students could effectively write off these fees against tax was abolished. The universities received a block grant in lieu of the fee income. This policy was outlined in a government White Paper in which it was asserted that "These decisions are a major step forward in the promotion of equality. They remove important financial and psychological barriers to participation at third level." (Department of Education & Science (1995), p106).

At the time of the reform, university fees varied between degree programs significantly (and to a lesser extent between universities) with fees in subjects like medicine, science and engineering higher than humanities, business and law[8]. These fee differentials remain for non-EU students applying. An irony associated with the timing of this policy is its pro-cyclicality: at the time the Irish economy had been growing rapidly with personal incomes rising generally.

A priori, given the high level of excess demand (with the number of applicants around twice the number of places) a reform which would stimulate demand seems unlikely to be effective. Moreover it achieves this by changing the relative price *against* the population who are

[7] These numbers are from O'Connell *et al*. (2006) Figure 1.2 p.16.

[8] See Clancy & Kehoe (1999) Table 1, p.45 for example. Students who have to repeat an academic year are also liable for fees.

under-represented. The reform also clearly generates a deadweight loss: individuals who were willing to pay for an investment now benefitted from the investment at the taxpayers' expense. An argument in favour of the policy that has been made was that the fees acted as a barrier to individuals whose parents' income was just above the threshold to qualify for the Higher Education grant, largely from low income white-collar backgrounds. Raising the threshold would obviously have been a more efficient solution to this problem to the extent that it existed.

This paper uses pooled cross-section survey data on school leavers to see whether the reform in question changed the SES gradient with respective to university progression. It also examines a closely related question the extent to which family background, including SES, predicts educational attainment at second level immediately prior to leaving school.

3.Data and methods

The data used to conduct the analysis is the ESRI School Leavers Survey. This is a random sample of individuals, collected annually, who were sampled approximately 9 months after they leave school[9]. The sample size varies between 2000 to 3000. The analysis here uses case deletion which reduces the effective sample size. Since the reform occurs in 1996, we use data for years 1994-1998 to abstract from any trends that may be occurring. Data for the years 1991-1993 are also available, however the results are not substantially changed if all years are included. After the period, the survey was discontinued although its collection has been resumed subsequently.

Because individuals are sampled 9 months after leaving school, those who start university after this will not be recorded as university students. Universities have "mature student" programs to encourage access by those who have left school a few years previously. In addition, one university has an evening degree although prospective students must have left school several years before they can enter this program. However in Ireland these forms of progression to university are relatively unusual and account for a small proportion of

[9] For more details on this data source see, for example, Byrne *et al.* (2009).

university students. Compared to the US, for example, Ireland is not a "second chance" society with most students entering university directly after school. Unlike the UK, "gap years", a year taken off between secondary school and university, are comparatively rare.

3. Results

To investigate the possible effect of the abolition of fees on progression to university, I estimate a set of probit models using pooled cross-section data for a five year period spanning the reform. As noted above, higher education in Ireland is and has been characterized by significant excess demand. So increases in aggregate participation are uninformative about any changes in demand. Having investigated the participation decision, an analysis of the determinants of attainment at second level is presented since this sheds a great deal of light on how SES impacts on university progression.

The first model estimates the probability of student i in year t going to university as a function of their SES (a set of dummy variables) and a number of covariates, X including wave specific dummy variables. Note the data consists of pooled cross sections & is not a panel so "i" indexes different individuals in each wave. The probability of an individual starting university, conditional on the right hand side variables is:

$$\Pr(\boldsymbol{uni}_{it} = 1) = \boldsymbol{G}(\boldsymbol{\lambda}_1 \boldsymbol{SES}_{it} + \boldsymbol{\beta}_1 \boldsymbol{X}_{it}) \qquad (1)$$

The vector of parameters λ_1 give the SES gradient. I then augment this model by including several measures of educational attainment in the nation-wide university entrance exam, the Leaving Certificate. What is important here is how this changes the estimates of the SES gradient i.e. how differs λ_2 from λ_1.

$$\Pr(\boldsymbol{uni}_{it} = 1) = \boldsymbol{G}(\boldsymbol{\lambda}_2 \boldsymbol{SES}_{it} + \boldsymbol{\delta}_2 \boldsymbol{Attain}_{it} + \boldsymbol{\beta}_2 \boldsymbol{X}_{it}) \qquad (2)$$

Finally, I interact the SES variables with a year specific dummy variable (FF_t) reflecting the timing of the reform. The parameters in α_3 provide an estimate of the extent to which the SES gradient has changed post-reform.

$$\Pr(\boldsymbol{uni}_{it}=1)=\boldsymbol{G}(\lambda_3\boldsymbol{SES}_{it}+\delta_3\boldsymbol{Attain}_{it}+\boldsymbol{\alpha}_3\boldsymbol{FF}_t*\boldsymbol{SES}_{it}+\boldsymbol{\beta}_3\boldsymbol{X}_{it}) \qquad (3)$$

The models are estimated by probit: using logit leads to the same conclusions.

3.1 Modelling the probability of going to university

This section models the probability of a school leaver progressing to university. The dependent variable is a dummy for whether an individual went to university or not. As the paper is concerned with only one transition the issue of dynamic selectivity bias highlighted by Cameron & Heckman (1998) does not arise. Table 1(a) and 1(b) contain cross-tabulations of the dependent variable against two measures of the father's economic circumstances, a 6 category classification of SES and a binary indicator for whether he was unemployed. Descriptive statistics for the regression sample are in Table 2. One can see from a glance at Table 1(a) that the proportion of respondents going to university is higher for those with higher SES backgrounds, the Pearson test rejects the null of independence: $\chi^2(5)=237$ (p=.000). Table 1(b) shows a positive association between going to university and one's father being employed. The Pearson test again rejects the null of independence: $\chi^2(5)=33.12$ (p=.000).

Table 3 presents the results from four probit models with different specifications. The coefficients are marginal effects evaluated at the means of the covariates. The first column models attending university as a function of the student's socio-economic background measured in terms of their father's occupation and labour market status and a small number of other characteristics but excluding any measure of performance in school[10]. The first three coefficients show the socio-economic gradient: a student whose father is a professional is

[10] All models include a full set of regional dummies (i.e. where the students are from) and year dummies which will control for any aggregate changes such as the expansion of the university sector in general.

about 30% (i.e. 30 percentage points) more likely to attend university than one who's father is semi- or unskilled. For the child of a father in the "other white collar" category the probability of attending university is 11% higher. That such a gradient exists is not surprising since the higher attendance at university by those of higher SES has been documented exhaustively in a series of reports published by the Higher Education Authority and initially compiled by Patrick Clancy starting in 1982, see Clancy (1982,2001) for example and O'Connell *et al.* (2004).

However multivariate analyses of this relationship are much less common and there does not appear to be papers which allow for school performance as this one does. It is worth noting that there is no statistically significant difference between the three lower SES categories: the children of skilled, semi-skilled and un-skilled manual workers – the latter two being the omitted category. In general, the earnings of the fathers in these three groups could differ quite significantly thus if credit constraints were in operation we would expect to find some differences in the proportion of their children attending university. By contrast, those whose fathers are unemployed are about 7% less likely to go to university, which may indicate the presence of credit constraints. However it is important to bear in mind that those from low income backgrounds are likely to be in receipt of the Higher Education grant which may have had the effect of neutralizing any credit constraints[11].

The second model adds measures of the student's performance in the Leaving Certificate which is the nationwide baccalaureate type exam which is required for entry to university. I include the number of LC points achieved and the number of honours grades (an A, B or C on a higher level exam) and the number of fails (E or lower on any exam). Alternatively one could have included some non-linearity in the total number of points such as a polynomial or a linear spline function however the results of interest are not sensitive to this choice. As expected, the probability of attending university is increasing in the points score and the number of honours and is decreasing in the number of fails. What is important here is the impact of these variables on the coefficients for father's SES and labour market status: they are clearly much smaller & less well determined than in the previous model. A joint test for

[11] At the time of the reform, for example about 30% of undergraduates at University College Dublin, Ireland's largest university, were in receipt of the High Education Grant (author's calculations). Aggregate data on the take-up of this grant is not available but is likely to be a similar percentage.

their statistical significance is borderline $\chi^2(4)=9.33$ (p=.0533). It is notable that once one includes these Leaving Certificate variables the coefficient on the female dummy variable is no longer statistically significance i.e. all of the differences between the sexes in terms of going to university can also be explained by the fact that girls do better in school.

It is clear that the coefficients on SES are a fraction of what they were in the previous model (column 1). The third model addresses the possible impact of the abolition of university fees by including a set of interactions between a "free fees" dummy variable with the four measures of the father's economic circumstances (the three SES dummies & father's unemployment). The "free fees" dummy variable indicates if the respondent entered university after 1995. The results show that the inclusion of these variables does not substantially change the results of interest. A test for the joint significance of the four interactions is $\chi^2(4)=5.23$ (p=.2644). A test for the joint significance of the original four direct effects is now $\chi^2(4)=3.06$ (p=.5477) while a test for the joint significance of all eight coefficients is $\chi^2(8)=14.40$ (p=.0718).

Since students were liable for 50% of fees in 1995 an alternative specification of the reform is as a step function equal to 0 before 1995, 0.5 in 1995 and 1 thereafter. Repeating the estimates in Table 3 but using this step function to generate the interactions does not change noticeably: the p values for the three tests reported above are .2027, .6957 and .0561 respectively. Since it is possible that secondary school students in 1996 might not have had time to adjust their plans to the abolition of fees, the final column repeats the model in column 3 but omitting that year. It is obvious that this too does not change the results to any noticeable degree.

The results and these robustness tests demonstrate clearly that the policy of abolishing university fees did nothing with regard to improving access to university amongst low SES students which was a stated objective of the policy. Bearing in mind that most low income students would typically not have been paying university fees (since most would be in receipt of the Higher Education grant) one would not expect a reform which largely benefitted better off students to somehow benefit low SES students.

3.2 Modelling the predictors of secondary school academic success

Given the evident importance of Leaving Certificate success for university and its implication for the SES gradient it is worth investigating what are the predictors of this success so in this section I model the determinants of LC points using linear regression. One could also apply this or similar approaches to the number of honours or fails grades achieved but it would add little of substance to the general findings. Before looking at the results of the estimation, it is worth graphing the distribution of Leaving Certificate point to get an idea of what one might expect, see Figure 2.

The location of the graph is as one would predict, the points distribution for those whose fathers are professional is to the right followed by that of other non-manuals relative to that of manual workers. However the graph reveals another interesting feature: the distribution for those from manual backgrounds is skewed right. That is, not only are their points lower than average but very few get high points (which would be required for entry into the most sought-after degree programmes such as medicine). For the other two groups, the reverse is true with the distributions skewed to the left: the chances of a student from a white-collar background achieving low points are quite low. Why this is so is unclear. Whether this is due to how the respective schools operate or their parents is a moot point.

On the basis of the results in Table 3 and Figure 1 one expects to find an SES gradient with respect to points. Column 1 of Table 4 shows the results of a simple linear regression using the same covariates as in Table 3[12]. What is striking is the size of the coefficients on father's SES: the child of a professional can expect to get about 92 points (about .76 of a standard deviation) more Leaving Certificate points than the child of a manual worker. For the children of other non-manual workers the advantage is smaller, but sizeable, at around 47 points. The child of an unemployed man can expect to get about 30 points fewer. This clearly explains why, in Table 3, once one controls for Leaving Certificate points, the direct effect of SES essentially disappears.

[12] The interactions with the reform are not included since one would not expect the relationship to change with the abolition of university fees.

A linear regression models the conditional mean of the distribution so in this case it tells us how an average student with particular characteristics can be expected to perform in the LC. However the mean is not the only parameter of interest. Koenker & Basset (1978) developed quantile regression to model conditional quantile functions. It generalizes Least Absolute Deviations which models the conditional median function. While this technique is now widely used in applied labour economics, especially in the study of earnings, care needs to be taken in the interpretation of the results. In particular it needs to be remembered that the different quantile functions refer to the conditional, not the unconditional distribution, of Y. The interpretation here follows that of Arias *et al.* (2001) which models earnings. To recall, the model is

$$Y = \beta X + \varepsilon \qquad (4)$$

In this case, Y is a measure of educational attainment at the end of secondary school (LC points) and X is a design matrix of covariates (including a constant) with associated parameter vector β. The disturbance term, ε , reflects unobserved factors that generate high levels of points as well as any measurement error which is assumed to be classical. Unobserved factors could include the innate ability of the students or perhaps school quality. Since our model is necessarily simple, many factors could enter here. So in modelling the conditional distribution of Y given X one is modelling the distribution of ε. Hence one can think of the higher conditional quantiles as corresponding to "lucky" students in that they have some unobserved characteristic(s) which generates higher scores in the exams. This paper interprets ε as partly reflecting unobserved ability but it could also reflect other unobserved factors such as school quality.

Columns 2 to 4 of Table 4 present estimates of conditional quantile functions corresponding to the 25^{th}, 50^{th} and 75^{th} percentiles. One could have estimated a larger number of functions, for example corresponding to the deciles, but the basic picture does not change so for reasons of parsimony three conditional quantile functions suffice.

The coefficients on fathers' SES are higher at the lower quantiles, with a big difference for the effect of having a father who is professional at the 25^{th} percentile compared to the 75^{th} percentile (113.03 vs. 74.04). Therefore if a student at the 25^{th} percentile of the conditional

distribution is, other things being equal, less able that someone at the 75th then having a high SES father have a greater impact on their points at the margin (relative to the omitted category). Intuitively this could be because the high ability student requires less help or is able to achieve his/her potential with less assistance. Alternatively it may be the case that parents choose to provide greater assistance to their less able children.

The same pattern applies for most of the other parental characteristics such as the penalty associated with having a deceased parent or a disabled father. That is, a student who is "unlucky" - in the sense of being at a lower conditional quantile of attainment- will suffer a greater penalty if they are unfortunate enough to have a deceased parent or a disabled father. The size of these penalties, of the order of 50-70 points, is significant in that it would have sizeable impact on what degree program a student could enrol in. One way of interpreting this, perhaps, is that those at the lower quantiles are more vulnerable to these disadvantages.

4. Conclusions and implications for policy

For young people from a low SES background in Ireland who wish to progress to university the dice are firmly loaded against them[13]. They will, on average, perform much worse in school and this is why they are less likely to be successful when it comes to attending university. The extent of this disadvantage may have lessened somewhat in recent decades as the supply of places in higher education has risen considerably. Hence policies that do not directly address the underperformance at secondary level (i.e. high school) are unlikely to have a major impact on the problem.

The main purpose of this paper was to investigate the effect, if any, of the abolition of university fees in Ireland in the mid-1990s. This reform, and the possibility of reversing it, has come under renewed discussion in recent years partly because of financial pressures on the universities as well as a desire for greater financial autonomy by them. However a defence of the reform that is commonly offered is that, somehow, it lead to greater access by groups that have been traditionally under-represented in higher education in general and university

[13] The latest figures, for the academic years beginning 2007 & 2008 actually show a small increase in the share of students coming from *higher* SES backgrounds, HEA(2010) Table 7.4.

in particular. On the face of it, this is highly unlikely to be true since prior to the reform many low income students did not pay fees because they received a means tested grant covering both tuition costs and a contribution to their living expenses. In effect, the reform withdrew the one advantage that low income students had relative to high income students. Defenders of the policy might to a general increase in access by low income group over-time. This is not serious evidence and ignores, in particular, the secular increase in the supply of places as universities and other higher education institutions expanded, see the numbers cited on page 5 above and Figure 1. Indeed while the absolute numbers from low SES groups rose, as a share they remained constant[14]. The research design used here, a micro-econometric analysis using a large representative sample, over a period spanning the introduction of the reform is clearly superior methodologically[15].

The results are clear and striking: the socio-economic gradient with regard to attending university can essentially be explained by differential performance at secondary school level. The gap between the sexes in progressing to university is also explained by the fact that girls do better in secondary school. In Ireland, the abolition of fees did not change the effect of SES on university entrance which was effectively zero before and after the reform once one controls for exam performance. The only obvious effect of the policy was to provide a windfall gain to middle-class parents who no longer had to pay fees[16].

The results reported here are very similar to those reported for the United Kingdom in Chowdry *et al.* (2009) who find that controlling for educational attainment at second level largely explains the SES gradient with respect to third level education. As Nicholas Barr put it succinctly: "It's attainment, stupid" (quoted in Gill (2009)). However in evaluating the absence of a direct SES effect conditional on school attainment it does not follow that "money doesn't

[14] Department of Education & Science (2003), Table 2.6

[15] Sweetman (2004) also evaluates this reform but does not consider the role of high school attainment which is crucial here.

[16] There is considerable anecdotal evidence that this increased demand for fee paying secondary schools as those parents who were formerly liable for university fees reinvested it in private schools (there is no publicly available data for this period on this trend). If this indeed was the case then, in the long run, the gradient of school attainment with respect to SES, shown in Table 3, could be even steeper, crowding out low SES students from higher education even more.

matter". Low income students would typically be in receipt of a means tested grant and this may simply have neutralized the effect of any credit constraints.

The policy implication that one can draw from this, and a theme that is emerging generally in the literature, is the importance of early interventions: disadvantage sets in early in life. Quite how early is unclear with some authors, notably James Heckman and co-authors, pointing to the necessity of very early interventions in life, see Doyle *et al* (2009) for a recent overview. So while this paper demonstrates that performance at the final secondary school exam is the proximate explanation for the SES gradient with respect to university it is not able to pinpoint the ultimate explanation i.e. what accounts for the differential performance at secondary level. It may be due to the differential effects of secondary schools however this cannot be assumed. It could, for that matter, be due to differences in primary schooling. Students from higher SES backgrounds make greater use of private tuition in preparing for the Leaving Certificate but, paradoxically, it appears to have no beneficial effect, see Smyth (2009). Perhaps it has nothing to do with schools at all but evolve from the home environment and parental investment in particular. Most likely, it is a combination of these. So while this paper can help rule out some explanations, it cannot identify exactly where the disadvantage sets in. One would need much better data for this.

This is not to say that early disadvantage cannot be remediated later to some extent. Irish universities operate "Access Programmes" which are interventions targeted at schools in disadvantaged neighbourhoods schools with a view to increasing the numbers of their students attending university and supporting those who do make it to university. Denny *et al* (2010) evaluates one of these programmes and finds well determined positive effects on students who received the intervention. The scale of these programmes are relatively small however, between 1999 and 2004 about 2% of the incoming undergraduates in University College Dublin, Ireland's largest university, were part of this programme[17]. The results also reiterate what might seem an obvious point namely that for policies to be successful they need to be targeted at the intended beneficiaries.

[17] See Denny *et al.* (2010) Table 3.

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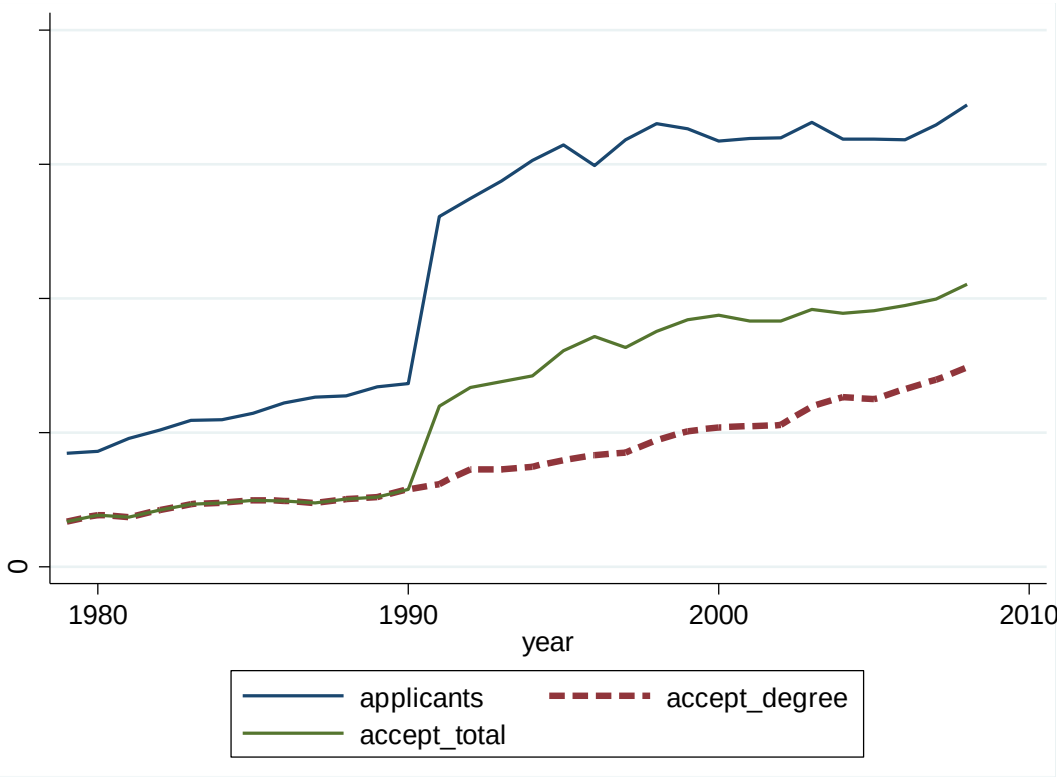
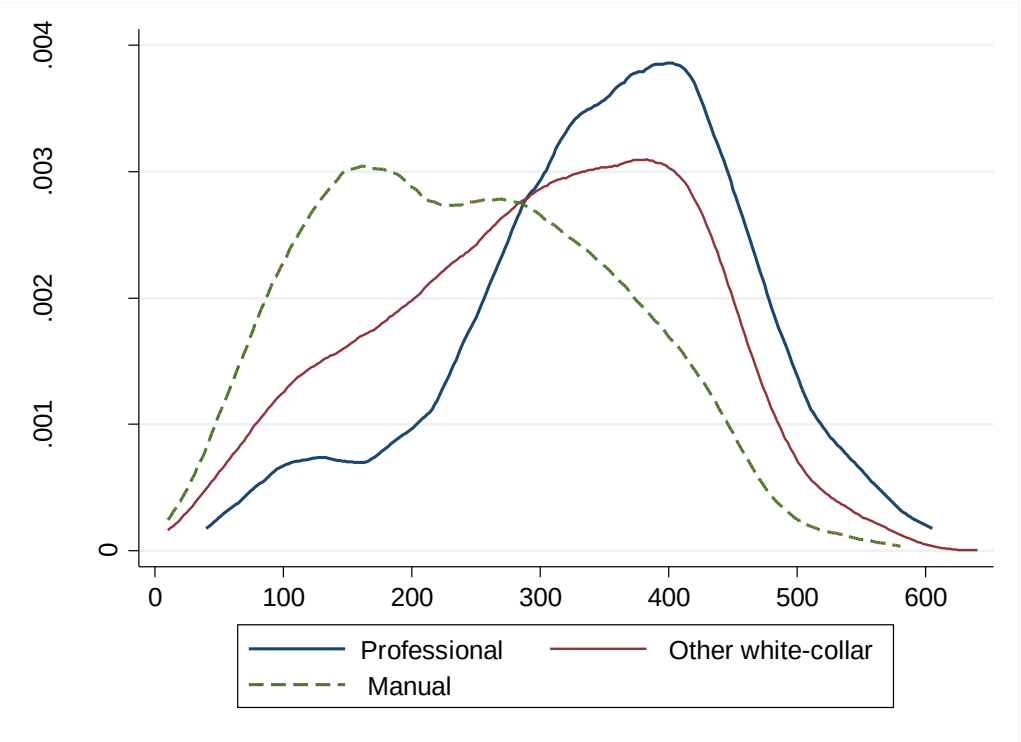
Figure 1: Trend in higher level applicants & acceptances for higher education



Source: Central Applications Office (2008), Table 1

Figure 2: Distribution of Leaving Certificate points by father's SES



Note: kernel density functions, Epanenikov kernels

Table 1(a) Father's SES & going to university

	At university	Not at university	Total
Father professional	129	147	276
	11.73	3.79	5.54
Father managerial & technical	542	1410	1952
	49.27	36.31	39.17
Father lower non-manual	111	314	425
	10.09	8.09	8.53
Father skilled manual	194	1262	1456
	17.64	32.50	29.22
Father semi-skilled	108	689	797
	9.82	17.74	15.99
Father unskilled manual	16	61	77
	1.45	1.57	1.55
Total	1,100	3883	4983

Note: Column %'s below absolute numbers

Table 1(b) Father unemployed & going to university

	At university	Not at university	Total
Father employed	1062	3548	4610
	96.55	91.37	92.51
Father unemployed	38	335	373
	3.45	8.63	7.49
Total	1,100	3883	4983

Note: Column %'s below absolute numbers

Table 2: Descriptive statistics for regression sample

	Mean	Std dev
university	0.221	0.415
points	275	121
No. of honours	2.72	2.33
No. of fails	0.304	0.677
Father professional	0.055	0.229
Father other white collar	0.477	0.500
Father skilled manual	0.292	0.455
Father unemployed	0.075	0.263
"Free fees"* Father professional	0.027	0.162
"Free fees"* Father other white collar	0.244	0.430
"Free fees"* Father skilled manual	0.143	0.350
"Free fees"* Father unemployed	0.041	0.198
Father disabled	0.020	0.142
Mother disabled	0.010	0.101
Parent dead (either)	0.046	0.210
Agee	18.62	0.986
Urban	0.472	0.500
Woman	0.509	0.500

Note : n=4983. "other white collar" consists of the 2nd & 3rd categories in Table 1(a). The omitted category is the 5th & 6th categories: semi- & un-skilled manual father.

Table 3: probit models of attending university

	(1)	(2)	(3)	(4)
Points/100		0.0553***	0.0551***	0.0539***
		(7.07)	(7.04)	(6.49)
No. of honours		0.0445***	0.0447***	0.0397***
		(9.87)	(9.88)	(8.24)
No. of fails		-0.0325*	-0.0320*	-0.0276*
		(2.38)	(2.34)	(1.95)
Father professional	0.305***	0.0413	0.0231	0.0212
	(8.03)	(1.85)	(0.80)	(0.79)
Father other white collar	0.114***	0.00688	0.0160	0.0138
	(6.67)	(0.63)	(0.97)	(0.91)
Father skilled manual	-0.0104	-0.00813	0.00743	0.0067
	(0.56)	(0.68)	(0.39)	(0.38)
Father unemployed	-0.0747***	-0.00669	-0.0210	-0.0198
	(3.79)	(0.41)	(1.15)	(1.19)
“Free fees”*Father professional			0.0312	0.0114
			(0.74)	(0.30)
“Free fees”*Father other white collar			-0.0157	-0.0187
			(0.79)	(0.95)
“Free fees”*Father skilled manual			-0.0251	-0.0142
			(1.28)	(0.63)
“Free fees”*Father unemployed			0.0467	0.0440
			(0.91)	(0.75)
Father disabled	-0.0747*	-0.00913	-0.00970	-0.0109
	(2.21)	(0.31)	(0.33)	(0.37)
Mother disabled	-0.0655	-0.0404*	-0.0390	-0.0416*
	(1.42)	(2.04)	(1.92)	(2.57)
Parent dead	-0.0265	0.0347	0.0340	0.0489
	(1.03)	(1.43)	(1.410)	(1.74)

age	-0.0738***	-0.0196***	-0.0195***	-0.0165***
	(11.44)	(4.49)	(4.47)	(3.75)
urban	0.183***	0.0479***	0.0476***	0.0488***
	(10.61)	(4.14)	(4.12)	(3.85)
woman	0.0576***	-0.00179	-0.0018	-0.0027
	(5.09)	(0.25)	(0.25)	(0.35)
Pseudo r-sq	0.1385	0.4810	0.4820	0.4829

Note: n=4983 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Absolute *t* statistics in parentheses . Year & region dummies not shown. Model 4 excludes 1996, n=3900. Estimation is by probit: marginal effects shown. For father's SES, three dummies are used "Father professional" corresponding to the 1st category in Table 1(a) "Other white collar" corresponding to the next two and "Father skilled worker" corresponding to the 4th category. The omitted category is semi & unskilled manual, the 5th and 6th categories.

Table 4: Determinants of Leaving Certificate points

	OLS	Quantile regressions		
		.25	.50	.75
Father professional	92.19***	113.30***	96.00***	74.04***
	(12.73)	(10.59)	(9.59)	(8.48)
" other white collar	46.88***	51.67***	54.00***	42.12***
	(10.49)	(7.32)	(7.23)	(7.59)
" skilled manual	-2.691	-3.333	-8.000	-6.442
	(0.57)	(0.49)	(1.09)	(1.13)
" unemployed	-30.23***	-35.00***	-35.00***	-30.67**
	(4.83)	(5.05)	(4.25)	(2.98)
Father disabled	-50.58***	-60.00***	-70.00***	-44.33*
	(4.18)	(5.20)	(4.21)	(2.29)
Mother disabled	-23.65	-36.67	-34.00	-46.92
	(1.43)	(1.92)	(1.52)	(1.15)
Parent dead	-33.53***	-46.67***	-41.00***	-26.35*
	(4.42)	(4.81)	(3.89)	(2.12)
age	-16.33***	-11.67***	-20.00***	-21.83***
	(10.23)	(4.79)	(8.67)	(9.89)
urban	56.18***	73.33***	70.00***	55.96***
	(11.89)	(10.01)	(10.58)	(9.40)
woman	26.64***	21.67***	31.00***	27.40***
	(8.44)	(4.94)	(6.45)	(6.72)
r-squared	0.1584	0.0806	0.1079	0.1076

Note: N=4983. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Absolute *t* statistics in parentheses. The 1st column is a OLS regression, standard errors are robust to heteroscedasticity based on the Huber/White estimates. Columns 2-4 are quantile regressions. Coefficients for region & year dummies are not shown. T ratios for the quantile regressions are based on bootstrapped standard errors, 500 replications.