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Abstract

There is a well established socioeconomic gradient in educational attainment, despite much effort in recent decades to address this inequality. This study evaluates a university access program that provides financial, academic and social support to low socioeconomic status (SES) students using a natural experiment which exploits the time variation in the expansion of the program across schools. The program has parallels with US affirmative actions programs, although preferential treatment is based on SES rather than ethnicity. Evaluating the effectiveness of programs targeting disadvantaged students in Ireland is particularly salient given the high rate of return to education and the lack of intergenerational mobility in educational attainment. Overall, we identify positive treatment effects on first year exam performance, progression to second year and final year graduation rates, with the impact often stronger for higher ability students. We find similar patterns of results for students that entered through the regular system and the 'affirmative action' group i.e. the students that entered with lower high school grades. The program affects the performance of both male and female students, albeit in different ways. This study suggests that access programs can be an effective means of improving academic outcomes for socio-economically disadvantaged students.

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There is a pronounced socioeconomic gradient in educational attainment, particularly at university level (see Digest of Education Statistics, 2007 for USA; Eurostudent, 2005 for Europe). Poor attainment by low socioeconomic status (SES) groups limits inter-generational mobility and reinforces socioeconomic inequalities. As there are many possible causes for such inequalities, including institutional barriers, low quality schooling, credit constraints or lack of parental investment, policies designed to address them vary considerably in their emphasis. Recent work has suggested the relative unimportance of credit constraints for university education in the US and the UK (Carneiro and Heckman, 2003; Dearden, McGranahan, and Sianesi, 2004) and emphasized the higher returns to early intervention in improving educational outcomes (Cunha and Heckman, 2007; Heckman, Moon, Pinto, Savelyev, and Yavitz, 2009b). Nonetheless, the most prevalent educational policy in most countries is targeted intervention programs by universities and colleges to boost enrolment and retention by disadvantaged social groups.

While access programs are becoming increasingly diverse in their approach to tackling the barriers to progression and promoting success at university, the majority of programs focus exclusively on providing financial supports to students. Thus much of the literature, as demonstrated in a review by Deming and Dynarski (2009), concentrates on the effectiveness of financial aid programs such as the Pell Grant and the HOPE scholarships. There are also some programs that couple financial aid with other forms of outreach initiatives such as academic and social supports. Yet evidence of the effectiveness of these more multifaceted programs is lacking, with only a few rigorous studies adopting experimental designs or convincing natural experiments (see, for example, Angrist, Lang, Oreopoulos, 2009; Brock and Richburg-Hayes, 2006; Scrivener, Bloom, LeBlanc, Paxson, Rouse and Sommo, 2008).

This study contributes to this literature by using a quasi-experimental design to evaluate a comprehensive university access program (AP) which operates at a large Irish university with over 20,000 undergraduates and postgraduates. The AP identifies students in disadvantaged high schools that are linked to the program based on a set of eligibility criteria. The program operates a range of pre- and post- university entry support mechanisms which provide financial aid, as well as academic and social support. Evaluating the effectiveness of access initiatives targeting disadvantaged students in Ireland is particularly salient given that the rate of return to education is higher than in other European countries and comparable to the US (Trostel, Walker and Woolley, 2002). Furthermore, educational inequality is high in Ireland where, out of twenty OECD countries, the correlation between father's education attainment and their children's education is greatest (Chevalier, Denny and McMahon, 2009), indicating that there is a need for policies to improve intergenerational mobility.

There is a well developed literature that shows the positive effects of financial aid on enrolment to university (for example, Cornwell, Mustard, and Sridhar, 2006; Kane, 2003; Dynarski, 2003). The magnitude of this effect is typically around a 5% or less increase in enrolment for a $1,000 reduction in student costs (Deming and Dynarski, 2009). Financial aid can also have a positive effect on university completion rates and graduating on time (e.g. Scott-Clayton, 2009; Dynarski, 2000). There is also some evidence that academic support programs, without financial aid, can be effective. Lesik (2007) finds a positive relationship between a remedial mathematics program and student retention using a regression discontinuity design. In addition, Scrivener et al. (2008) identify a positive treatment effect on first semester academic performance in an experimental evaluation of the Open Doors program in a US community college which provided improved counselling and monitoring of students.

However there have been relatively few studies that examine programs such as the AP discussed here, that combine financial aid with academic and social supports. Exceptions include Angrist, Lang and Oreopoulos (2009) which conducted an experimental evaluation of the Student Achievement and Retention (STAR) project in a Canadian university. Students were randomly assigned to three groups which received academic support, financial incentives or a combination of the two. The program was found to reduce the probability of first year withdrawal by 10% and had positive effects on GPA. These effects were greater for students who received the combined financial and academic supports, yet the effects were for women only.

Another study by Brock and Richburg-Hayes (2006) evaluates the impact of a Louisiana needs-based scholarship program on course completion and exam performance of low-income parents attending community college. Students were randomised into a treatment and control group. In addition to the regular financial aid received by the control group, the treatment group students were given scholarships of $2,000 per annum if they attended at least half-time and attained, on average, a C grade. While both groups could avail of counselling services, the treatment group were obliged to attend student counselling in order to receive the financial aid. The program had multiple positive effects, in particular the treatment group were more likely to be full-time college students, passed more college courses and earned more credits, and were more likely to register for their second and third years of college.

In addition to the financial, academic and social elements of the Irish access program, another key aspect is that preferential entry to university is given to some students i.e. some AP students enter university with grades that are lower than the regular minimum grades necessary to be offered a place at university. Although this preferential treatment is not based on ethnicity, there are some parallels with US and Indian affirmation action (“positive discrimination”)

programs (Deshpande, 2006). Affirmative action programs based on ethnicity have proved controversial in recent years (see Fryer and Loury (2005) for an interesting discussion). One criticism is that race-based affirmative action is seen to favour economically well-off minority students. This has led to calls for the ethnicity criteria to be replaced with socio-economic criteria. The Irish AP, which is based on socio-economic criteria alone, may therefore be informative for policymakers considering a switch away from such race-based criteria.

In the absence of a randomized control trial, our analysis relies on a natural experiment which exploits the gradual and non-systematic expansion of the program over time. The identification strategy compares students from high schools which were chosen to be part of the program in the early years to those that were chosen to join the program in later years. As there was no systematic difference in the characteristics of the high schools which joined the program at different times, a comparison of students from these schools allow us to identify the treatment effect. Our analysis examines multiple outcomes including first year exam performance, progression rates to the second year of study, and the probability of graduating. In addition, we model the impact of the program on final degree classification which is often overlooked in the literature, despite some studies finding a high rate of return to university grades (see Jones and Jackson, 1990; Schweri, 2004; Bratti, Naylor and Smith, 2007).

Overall, we find positive program effects on first year exam results, progression to second year, and graduation rate, with the impact often stronger for higher ability students. Unlike the Angrist et al. study, we identify effects for both male and female students. We find similar patterns of results for treated students that entered through the normal entry system and the 'affirmative action' group i.e. the treated students entering with lower grades. Note that the

analysis is based on university administrative data, therefore all results are conditional on the student having applied and been accepted into the university.

The paper is organised as follows: Section II describes the access program in detail. Section III discusses the methodology employed and data used in the analysis. Section IV presents the main results of the analysis and a description of the sensitivity analysis conducted. Section V discusses the results and concludes.

II. Description of the Access Program

The program has been operating since 1997 and aims to increase university participation and improve the academic performance of students from socio-economically disadvantaged backgrounds through a range of pre- and post- entry support mechanisms. Much of its pre-entry activities involve outreach activities with disadvantaged schools at both primary (4-12 years) and second level (12-18 years) which focus on raising student aspirations and creating an awareness of further education. These activities include field trips to the university where students attend sample lectures, participate in science labs, as well as a variety of sports and social activities. The AP also organizes pre-entry orientation programs and shadowing days where high school students follow a university student through a day at university. The program also provides direct academic support to high school students for the university entrance exam in the form of one-to-one tuition and revision workshops. On a community level the AP gives presentations to parents and contributes to community-based events. The number of pre-entry activities provided to schools varied overtime, with an average of three activities in 1999 and 2000, seven in 2001 and

2002, and six in 2003 and 2004.[1] The aim of these pre-entry activities is to increase the number of applications to university by disadvantaged students.

The AP also provides information to the students about its alternative entry mechanisms into university. The regular Irish university admissions system is a nationally administered clearing mechanism based on supply and demand for university places across all of the third level institutions. Prior to taking the final state exams at about age 18, high school students rank their top ten preferred degree courses. Their chosen courses may be at different universities and/or be different courses at the same university. Several months later they take their final state exams. These exam grades are converted to a points-scale from 0-600 in increments of 5 points and are used to rank the students. 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.[2] Further offers are made on the basis of grades until all places have been filled. 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. The supply of places on degree courses seldom changes from year to year. The minimum points necessary for a place on a course, which is set by the grades of the last person admitted, can fluctuate from year to year.

Under the AP, two types of students are treated. "Merit Treatment" students are admitted to university through the nationally administered admissions system described above. About 45% (from a total of 100-140 students per annum) of AP students attain sufficient grades to meet

[1] The activities include: shadowing days, voluntary tutoring, Take 5, Uni 4 U summer school, 5th Year summer school, achievement awards, educational funding, Uni in Community, Leaving Certificate Exam workshop, Discovering University, Discovering Maths, and the HEAR Scheme.

[2] Offers are made on the basis of actual grades attained in the final state exams and not on grades predicted by teachers, etc. Applications are anonymous and personal statements, references from teachers, subject specific aptitude tests, interviews, etc. are not used in this system. See Gormley and Murphy (2006) for a more detailed description of the university admissions system in Ireland.

the minimum points level for regular university entry and are allocated a place on their preferred course in the usual manner.

"Discount Treatment" students (the remaining 55% of the total) receive preferential treatment in attaining their university place such that they receive a concession of up to 20% on the competitive entry points for the course set by the national admissions system. Thus a certain number of places on each course is reserved for students who do not meet the minimum points level required for that course. To be offered one of these places they must meet certain basic requirements (e.g. a medical student must have studied science at high school) and provide further information regarding their socio-economic circumstances (discussed below) as well as references from their high school teachers[3]. The number of minimum reserved places on each course is based on the size of each faculty in the university and is relatively fixed. If there is a surplus of suitable and eligible applicants for these places, the limited places are awarded on the basis of points attained in the final school exams.

Note that AP students are not guaranteed a place in the university. Essentially, the number of points they receive in the school exam and their preferred course choice determines whether they are classified as Merit or Discount students. Discount students are not necessarily of a lower ability than Merit students, rather, they may have applied for a course that required higher minimum points.

Post-entry, both Merit and Discount AP students receive the same supports. Students receive an extra top-up grant which supplements the regular means tested government grant[4] and

[3] These references are only considered in tie-break situations i.e. where two or more students with the same points are competing for a place on the same course. Therefore, this subjective information is not used by the AP office in the majority of cases.

[4] The majority of AP students are in receipt of the means tested government grant which is valued at €2900 ($4265 USD) and €3300 ($4854 USD) per annum in 2008 prices.

in most cases, doubles the amount of financial aid they would otherwise receive. This grant totalled between €2200 ($3236 in 2008 prices) and €3400 ($5000 in 2008 prices) per annum during the period under analysis. In addition, they receive book vouchers and course materials such as laptops, lab coats, etc. The AP students are also provided with a number of post-entry supports geared towards liaising with students once they have commenced their studies. They participate in a pre-term orientation week where they live on campus with other AP students to encourage early social and academic integration. To help maintain their academic standards while at university, they also receive free additional tuition, if required, in the form of one-to-one and group tutorials. Finally, the AP students can avail of social supports, if required, from student advisors in the AP office.

In order to be eligible for the program, for both Merit and Discount students, must meet four criteria. First, eligibility is means tested such that parental income has to be below a certain threshold which shadows the eligibility for the regular means tested government grant which is available to all students whose family income falls under these thresholds (and unlike the AP, it is available to all low SES students regardless of the high school attended). As family income is not available in the data, one of the selection criteria for choosing the Control group is based on receipt of the regular grant. Second, in order to be eligible for the AP, neither parent must have graduated from university. Third, the student's parents must be a member of the following socio-economic groups: unskilled manual, semi-skilled manual, skills non-manual, and non-farming

agricultural workers.[5] Students whose parents are professionals, employers or managers are not eligible for the AP. As measures of parental education are not available in the data, socio-economic status is used as a proxy for parental education.[6] Finally, the student must be attending a high school which is designated as 'disadvantaged'. This criterion is key to the identification strategy and is discussed in detail below.

III. Data and Methods

A. *Identification Strategy*

The identification strategy is similar to that in Lavy and Schlosser (2005) which relies on the expansion in the number of schools participating in a remedial educational program in Israel. Hence the identification strategy exploits the gradual, and non-systematic, expansion of the program into high schools over time.

The key eligibility criterion of the AP is whether a student attended a disadvantaged high school linked to the AP prior to entering university. When the program began in the late 1990's, certain high schools were identified from the Government's list of officially designated disadvantaged high schools and became linked to the AP. Schools are included on the Government's list based on a range of socio-economic and educational indicators such as local unemployment rates, measures of poverty and information on basic literacy and numeracy levels

[5] There is some evidence that farmers and self employed people circumvent the rules on grant eligibility (Department of Education, 1993) so by including these groups we could have control student who are better-off financially than the treatment group. Furthermore, as rural schools tended to join the program at a later stage, we do not wish to conflate the effect of coming from a rural background with that of the program. Therefore farmers are excluded from the Control group. It is not possible to identify self employed people using the socioeconomic categories observed in the data.

[6] It is possible that there are parents with university level education in the remaining social-economic groups (i.e. unskilled manual, semi-skilled manual, skills non-manual, and non-farming agricultural workers), although we assume that this is not the case in general.

in the area. Over time more schools from this list were linked to the program when funding allowed.[7] The data available for the analysis covers 1999 to 2004, therefore schools linked to the AP in 1999 or before represent an "always" covered group i.e. students from these schools, who have satisfied the other eligible criteria, are always in the treatment group in the analysis. Those schools who were included in the program for the first time in 2005, or after, represent a "never" linked group.[8]

Essentially, the analysis compares the treated students who participated in the AP, to students who met all of the other eligibility criteria discussed above, except their schools had not yet become linked to the AP at the time they came to university. However, these students' schools eventually became linked to the program. The Treatment group is therefore all Merit and Discount students who attended a disadvantaged school linked to the program and entered the university between 1999 and 2004. We conduct the analysis using both groups pooled together and for the Discount and Merit students separately. The Control group consists of students who were in receipt of a state grant, members of one of the six identified lower social-economic groups, and attended a disadvantaged school which was not linked to the program at university entry, but later became linked to the program.

B. *Assumptions of the Identification Strategy*

The identification strategy is based on the assumption that there was a random selection of schools into the program. One concern with the expansion of the program is whether the date at which schools became linked to the program depended on the characteristics of the school. If

[7] No school which joined the access program has been dropped or exited from the program.
[8] The period covered by the data could not be extended in either direction due to changes in data storage systems and the adoption of a new North American style GPA system to replace a traditional British style grading system in 2005.

there was a non-random selection of schools, this may bias the results as the Treatment group (those who joined earlier) and the Control group (those who joined later) may systematically differ. However for several reasons we believe this is not the case. First, there was no self-selection of the schools into the program as the schools were chosen by the AP to join the scheme. Second, there is little overt heterogeneity in the quality of high schools linked to the AP. The Government list from which the schools are drawn is not a ranking and thus each school is regarded as being equally disadvantaged in that they all receive the same level of additional government funding compared to regular schools. When the program first began, the AP worked with schools that were geographically close of the university, and when funding allowed, the program expanded to include schools in different regions. Thus the expansion of the program was geographically, rather than socioeconomically, based. In addition, the expansion of the program to new schools was dependent on funding from the Irish government, the EU and from other philanthropic bodies, and as such can be viewed as an exogenous source of variation in the treatment group. These factors reduce the likelihood that the schools which joined the AP at different times were systemically different.

A further source of exogenous variation in the expansion of the AP was the introduction of a national access scheme in 2001 to co-ordinate the allocation of places for access students amongst nearly all Irish universities. Prior to the introduction of this scheme, the university in this study was generally linked with schools in its own defined catchment area. Students who met the eligibility criteria, but attended schools linked with other universities, could not take part in this particular access program, yet they could attend the university without being treated. After 2001, students from schools in the catchment area of other universities could apply for the AP at this university. Essentially this policy change linked 125 new schools to the AP, however these

schools did not receive the pre-entry supports[9]. This major administrative change occurred during the period covered by the data and represents an exogenous policy change that greatly expanded the number of linked high schools.

To provide evidence that the date on which a school joined the AP is not a function of its individual characteristics e.g. school quality, Table 1 presents two local labour market characteristics of the electoral district of the link schools prior to them becoming linked.[10] The table indicates that there is no clear relationship between the characteristics of the school's neighbourhood and the year in which the school joined the program. Apart from 1999 when the local unemployment rate and proportion leaving school before age 18 is higher than subsequent years, there is no systematic variation in the rates over time. This suggests that Control group students did not attend schools in neighbourhoods that are significantly better or worse than the treated schools which became linked earlier.

Under normal circumstances, a student must have attended the same linked school for a total of five years before applying to the university to avail of the program, however exceptions are made for recent immigrants or returned emigrants. Despite this, there may be a concern that parents chose to send their children to high schools that were linked to the program in order to avail of the AP supports, and the alternative entry mechanism in particular. In Ireland, there are no geographical restrictions on school choice (i.e. no catchment areas), so in principle, there could be self-selection into an AP linked school if, for example, families who send their children to an AP linked schools have some unobservable characteristics which also affect student outcomes. A priori this is unlikely for two reasons, firstly, AP schools are typically clustered into

[9] Although they may have been treated by the university which was originally linked to their school. The majority of Irish access programs offer similar pre-entry supports to those provided by this AP.
[10] Aggregate exam results for each school are not available to the researchers, therefore local labour market and educational attainment data is used as a proxy.

disadvantaged neighbourhoods, so the switch to an AP school would require the student to travel a significant distance to another school, secondly, many low SES parents are unaware of the AP status of the school prior to school entry, as much of the AP supports do not begin until the later grades.

C. *Self Selection & the Control Group*

As we only observe students who attend this university, our analysis is conditional on enrolment. A consequence of this is that our Control group, who are socio-demographically similar to the Treatment group, may be a self-selected group as they choose to attend university without the safety net of the access program. Such students may perhaps be unobservably more able or more motivated. Table 2 reports the average university entry grades for the Treatment and Control students. While the grades of the Control students are slightly higher than the Treatment students, by between 2% and 10% (9 and 48 points), there are no systematic changes in the ability of either the Treatment and Control group over time, suggesting that the composition of the groups are not changing.

In addition, Figure 1 shows the university faculty of the Treatment and Control group before and after the 2001 introduction of the national access scheme. It shows that firstly, there is little difference between the faculty of choice for the Control group before and after 2001 suggesting that the introduction of the reform did not change the faculty choice of the Control group, and secondly, there is little difference in the faculty of the Treatment and Control groups, with slightly more AP students studying Commerce and Law after 2001.

While these data suggest that the Control group do not differ in quality, over time, in any observable way it is still possible that they differ with regard to unobservables. If this is the case,

the treatment effect may be an underestimate of the true treatment effect. To account for this, we control for both ability (school grades) and faculty in our models.

D. *Pre- and Post-entry Effects on Treatment Group*

A potentially important issue is that our results are conditional on treatment students having entered the university. Hence, the initial pool of applicants to university is not observed and so we do not model selection into the university. It is possible that both school grades and faculty of choice are influenced by the pre-entry supports provided by the AP (such as the outreach activities and academic support), and hence there may be a correlation between unobservables that affect the outcome and the probability of treatment. As we only evaluate university based outcomes, such as drop-out and exam performance, it is conceivable that the results may be driven by such selection effects in either a positive or negative direction. On the one hand, the pre-entry supports may increase the student's university entry exam grades either directly (through additional tuition) or indirectly (by improving motivation). On the other hand, there could be a complacency effect in that the student reduces their effort in their entry exam in the belief that they may be able to enter university with lower required grades. This impact of this selection effect on the results will depend on which effect dominates. It is also possible that the pre-entry supports were not effective at improving entry exam grades and thus progression to university. In this case, any observed treatment effects on university outcomes could be attributed to the post entry supports and selection into university would not be an issue.

As the distribution of the pre-entry supports is not uniform across all linked schools we can investigate these potential effects. Some schools receive more pre-entry activities than others, while some schools only receive the alternative entry mechanism support. In general,

schools that are located in the cities, receive more supports than the rural schools. In addition, the number of services provided to schools typically increased over time. To investigate the impact of the variations in pre-entry supports, we will estimate our results separately for students that attended schools which received full pre-entry support and those that attended schools which only received limited pre-entry support.

E. *Identifying Suitable Controls for Discount Students*

As we are comparing Discount students to students who have higher university entrance exam grades, a potential concern is that our Treatment and Control groups are not comparable. However this is not necessarily the case as there is an overlap in the support of the entrance exam grades for these groups. Table 3 shows that the distribution of university entrance exam grades intersects for Control students and all but the lowest achieving Discount students. In some cases we have Control students with the same university entrance exam grades as Discount students in the same course but who entered the university in a year where the minimum points level had been lower. For example, there are Discount students who entered the Agricultural Science degree in 2001 with 320 points when the minimum required for the general student body was 330, and the following year a Control student entered with 320 points as the minimum required had fallen to 310.

Note that all of our estimates control for the faculty of the student, rather than the individual degree course within that faculty (which will have similar modes of teaching and assessment) which also allows us to identify Discount and Control students with the same grades, e.g. in a given year within the Medicine Faculty we have Control students doing

Physiotherapy (minimum 500 points) with 505 points and Discount students doing Radiography (minimum 520 points) with 505 points.

However for the Arts degree course, which is the lowest entry course and the largest course, there are Discount students who have lower points than anyone else in the university and few Control students with similar level of points. Table 3 shows that, in particular, there are large differences in the number of Discount and Control students in the lowest points category. While this will not affect the results for higher achieving student (>400 points), it may downwardly bias the results for the low point students if we are comparing the low point Discount students to Control students who mostly have higher points.

F. *Method*

Rather than using a standard 'differences in differences' method which would require controlling for school fixed effects by including dummy variables for each school, we estimate a simple 'differences' model. This issue arises as there are over 300 linked schools involved in the AP and only 322 students in the Treatment group. While we report differences-in-differences results in the appendix, which includes individual school dummies to identify school fixed effects, we do not report them in the main results as our relatively small sample size places restrictions on our ability to control for initial conditions.[11]

For the binary outcomes, such as progressing to second year, graduating and graduating on time, we estimate linear probability models and for the categorical outcomes, such as first year exam results and final degree classification, we estimate ordered probit models. These

[11] Due to the very nature of the program some schools only send a very small number of students, if any, in a given year to the university.

models control for faculty, year of university entry, and number of points attained in university entry exams[12], however only the results for the main outcomes of interest are presented.[13]

G. *Description of Data*

We use pooled cross sections of student level administrative data containing information on all students entering the university from 1999 to 2004 inclusive. The data contain information such as student outcomes at university, pre-university academic performance, high-school attended, grant status, the student's age, gender, treatment status, and markers of eligibility such as the socio-economic group of the student's family. Some school-level information was matched to the individual student-level data using a school identifier. For example, census information on labour market conditions, such as average years of schooling and unemployment rates in the electoral district of a particular school were included. School level information regarding exam results and other school "quality" variables could not be included as this information is not available to researchers in Ireland.[14,15]

Broadly speaking, our outcomes of interest measure different facets of academic performance in the first year of university as well as the overall performance of the student in

[12] Throughout these models we have controlled for university entrance exam points linearly, however, broadly speaking the pattern of results holds when controlling for university entrance exam points using different non-linear functions.
[13] The full set of results are available upon request.
[14] Fewer than 15% of observations could not be matched. This includes students with missing school information, overseas students, those from Northern Ireland, and those from schools which have since closed. We only examine students when making their first attempt at a course in the university. Those who switched courses or repeated a year have had their later observation dropped. Unfortunately, it is not possible to detect students who have transferred from other universities.
[15] The working sample excludes those who have no school-level data and students who entered the university directly rather than through the university central clearing system for school leavers (e.g. disabled students, certain mature students, transfers from vocational courses, etc). A very small number of students who died during their time at the university have been excluded from the analysis.

their degree course.[16] Table 4 shows the grade classification in first year exams and proportion of students progressing to the second year for Discount and Merit AP students, Control group students and the general student population. The first year exam results are categorised using the first, second upper, second lower and third categories traditionally used in Ireland and Britain rather than using the exact grades or a North American-style GPA system. A comparison of the British/Irish and North American grading system is provided in Appendix Table A1. Table 4 identifies a striking difference in the performance of Discount and Merit groups, with Merit students typically outperforming the Discount students. 10% of Merit students attain a first class honour, compared to only 3% of Discount students and 9% in the general student body. While about 20% of both Merit and Discount students attain a third class honours. The first year summer exam failure rate of ~50% is very high for the Discount students whereas Merit students perform quite favourably compared to the Control group and the general student population. Progression to second year is defined as passing either the summer exams or the repeat exams. Table 4 shows that both Treatment groups have lower progression rates to second year than the Control group and general student population. It is worth noting that the progression rate of Discount students, while lower than the other groups, is just over 80% despite that only half of these students pass the exams at their first sitting.

The analysis also examines the probability of graduating, graduating on time and final degree classification. The sample size at this point is smaller as many of the students who had entered university in the later years had not been in the university long enough, at the time of data collection, to complete their degree in the normal time-frame. Table 4 shows that graduation

[16] We do not to look at outcomes in the second year, third year, etc., of a degree course as courses are of different durations and some courses use pre-final year exam results for final degree grades whereas others do not. In addition, the majority of dropping-out (~80%) in Ireland occurs between first and second year, which is a far higher than the UK figure of 56% (Smith and Naylor, 2001).

rates for Merit students are higher than the Control and the general population groups and that Discount students have graduation rates similar to both of these groups. Graduating late will have explicit costs of studying for at least an extra year. In Ireland, there is an extra disincentive to not delay graduation as tuition fees, which are normally waived for Irish students, are payable for repeated years of a degree course. There are also implicit costs of forgone graduate earnings. Table 4 shows that, of those who do graduate, the proportion of those graduating on time is slightly higher amongst both Treatment groups.[17] For those who do graduate, final degree classification for Discount students compares slightly less favourably than for Control students. However it is striking that around one-fifth of Merit students receive a first class honours.

Tables 5, 6 & 7 show the socio-demographic and academic characteristics of the students broken down by the four categories. Table 5 shows, of the total number students in the sample, the percentage admitted to the university each year. The Control group and the general student population are more evenly spread across the years than either Treatment groups due to the expansion of the AP. The number of treated students, both Discount and Merit, represent less than 2% of the total admissions to the university each year.

Table 6 shows that females are over-represented in the AP relative to the general student population. All students in the Control and both Treatment groups receive the regular means-tested government grant as the income eligibility rules for the AP are the same. For similar reasons, the distribution of students across parental socio-economic groups is restricted to lower socio-economic groups for the Control and both Treatment groups and is quite unlike the distribution of the general student population. Table 6 shows that the parents of the Control group are mostly salaried and skilled-manual workers and students in the Treatment groups are

[17] Unfortunately it is not possible in this data to distinguish between students who repeat years because of failing exams or illness or by choice.

more likely to have parents in less skilled groups whereas the managerial and professional category is the largest group among the general student body.

Table 7 shows the distribution of students across the university's faculties. The Control group and the Discount group are more heavily concentrated in the Arts and Science faculties compared to the general student body as these faculties have lower minimum entry standards than the other faculties. The distribution of the Merit group more closely resembles the distribution of the general study population, with the exception being a greater number in the Commerce faculty. The next section estimates the causal impact of the AP on these outcomes.

IV. Results

The impact of the program on the first and final year outcomes for both the Discount and Merit groups is presented in Table 8. The same Control group is used in each analysis. Separate results are also presented for students who attained 400 points or less in their university entrance exam, and for students who achieved more than 400 points, to determine if the AP has differential effects across high and low ability students. 400 points is roughly the 75^{th} percentile of attainment in the final state exam taken by school leavers and is sufficient to enter the two largest faculties in the university, Arts and Science, with more prestigious courses like Law and Medicine requiring well in excess of 500 points.

A. *First Year Exams*

Table 8 shows that the AP has a positive effect on first year grades, such that the entire distribution for first year exams is shifted upwards for both types of Treatment students. While there is no effect on achieving a first class grade, Discount and Merit students are nearly 5%

more likely to attain either an upper second class grade or a lower second class grade than students from the Control group. Merit students are less likely to achieve a third class honour grade. The marginal effect of the program on passing the Autumn repeat exams is negative for Merit students. However it should be noted that in this ordered model we have ranked 'passing in the repeat exams' as a worse outcome than passing in the summer exams, but better than failing overall. Therefore, the negative marginal effect of the program on passing in the repeat exams can be explained by the program reducing the need to sit repeat exams, and hence does not necessarily contradict the positive effect on passing the repeat exams. Both Discount and Merit students are also less likely to fail their first year exams. Merit students are 3.9% and Discount students 4.6% less likely to fail their summer exams relative to the Control group. Table 8 also shows the impact of the AP on first year exam results for high (>400 points) and low point (<400 point) students. It shows that the exam result effects are been driven by the high point students alone, with none of the results for the lower point group being significant. Therefore the program is primarily generating exam benefits for the higher ability students.

Table 8 also shows that the program increases the probability of progressing to second year for Discount students by 11.2%, while having on effect on Merit students. When the results were estimated separately for high (>400 points) and low point (≤ 400 points) students, the effect of program participation remains positive and significant for both high and low ability Discount students. Low point Discount students are 15.8% more likely, and high point Discount students are 11.1% more likely, to progress to second year.

B. *Overall Degree*

Table 9 presents the impact of the AP on the probability of graduating from a degree course. It shows that, overall, program participation has a large positive impact on graduation rates for both Merit and Discount students. Merit students are 9.7% more likely to graduate from their degree program, while Discount students are 14.8% more likely to graduate. However, Table 9 also shows that the AP has no statistically significant impact on the probability that students will graduate on time. A similar result is found in regards final degree classification. The Ap has no statistical impact on the final exam performance of Discount students and for Merit students there is only one significant result: they are 6.1% more like to attain an upper second class honours grade. Therefore, while the program has some long term effects, they are mainly related to helping the student to reach the final year, rather than their overall degree performance. Due to sample size limitation it is not feasible to divide the final year outcomes into high and low point students.

C. *Selection Effects*

As discussed above, one may argue that the AP's pre-entry treatment may be changing the pre-entry academic achievements of the students. The pre-entry activities, such as summer schools and extra tutorials, may directly improve performance in the university entrance exam, thus upwardly biasing the treatment effects observed above. As the pre-entry activities were primarily conducted at urban schools, we re-estimate the results for students who attended limited pre-entry support schools and full pre-entry support schools[18].

[18] Information regarding the number and type of pre-entry activities is available for all linked schools in each year. A school which received 3 or more activities is considered receiving full pre-entry supports, while a school receiving less than 3 is considered a limited supports school.

The results presented in Table 10 show that there are few differences in the treatment effects for the students that attended either the limited or full pre-entry support schools. The program has some impact on the first year exam grades of Discount students from limited support schools and Merit students from full support schools. However, the program has no impact on the progression rates to second year for students from either school type. For final year outcomes, the program only has a positive impact on graduation rates for the students who attended the limited pre-entry support schools, yet only affects students in the high support schools in terms of final degree classification. Therefore there is little evidence that students from the high support schools are systematically better than the students from the limited support schools suggesting that the pre-entry activities are having a minimal effect on the pre-entry academic performance of the students and that the main results are not driven by selection bias.

D. *Robustness, Sensitivity and Extensions*

While the main analysis does not control for school fixed effects due to the large number of dummy variables that would need to be included in the analysis, Table 11 reports the results of the estimation including approximately 160 high school dummies. In general, these models show that we largely replicate the original analysis, albeit with less precision.[19]

As an alternative to using school dummy variables to pick up school fixed effects we could alternatively use some measure of school quality. However school quality variables are not

[19] Another underlying assumption of the analysis is that the average change in the outcome is presumed to be the same for both the control and, counterfactually, for the treatment group if they had not participated in the AP. We are currently assuming that the school level inputs are constant overtime. However, as discussed above, data on the quality of schools are not available for Ireland, therefore we cannot verify this assumption. For a violation of this assumption to bias our results greatly, the quality and distribution of school level inputs would have to have changed significantly in a short period of time (within 5 years). While we cannot observe this directly, it is unlikely to be the case.

publicly available in Ireland so it is difficult to ascertain the heterogeneity in the quality of schools linked to the program. In one of the few sources available to us, The Sunday Times Guide to Secondary Schools in Ireland, nearly all of the ~300 schools[20] linked to the AP are in the bottom 300 places when ranked by the proportion of students that enrol in university. In order to control for different levels of socio-economic disadvantage in the neighbourhood of the student, Table 12 shows the impact of the program when controlling for labour market conditions in the locality of the high school. The results are largely in line with the original analysis in terms of size and significance suggesting that there was no systematic selection of the high schools over time into the AP which would bias the results.

Table 12 also shows the analysis by splitting the sample into males and females to determine whether the AP has differential impacts by gender as found by Angrist et al. (2009). Overall, we find that the AP has differing effects on males and females depending on the outcome under consideration. In regards first year exam outcomes, the program primarily has an impact on female students in regards exam performance and both male and female Discount students in regards progression to second year. While the program has a positive effects on the probability of graduation both for females and males, it has a negative effect for males in regards final degree classification. However, the sample sizes at this point are perhaps too small to draw solid conclusions of a weaker/stronger result for one particular gender. These results are contrary to Angrist et al. (2009) which conclude that the STAR program, which is similar to the AP considered in this study, only has effects for females.

A number of additional alternative specifications were considered. We did not find the treatment effect to vary by the faculty of the student. Furthermore, we investigated the existence

[20] Not all of the schools sent students to this particular university in the study period.

of peer effects in relation to the program; however we could not identify an effect based on having a high proportion of fellow AP students in a particular course or students from a similar social background. For all of these alternative specifications, sample size may inhibit the detection of an effect.

E. *Impact of Variations in Financial Aid Package*

Unlike Angrist et al. (2009), our natural experiment does not allow us to identify the relative effects of the individual financial, academic and social supports. However variation in the levels of financial aid over time allows us to identify the effects of changes in aid on student outcomes. The amount of financial aid made available to each student changed during the period covered by the data due to funding availability. Furthermore the value of the regular state means tested grant, which the majority of AP students additionally receive, also changed over time. The sum of the total value of the AP's aid package was particularly high in 2000, 2001 and 2003 with an average of €6313 (expressed in 2008 prices) per annum. While the average in 1999, 2002 and 2004 was relatively lower at €5407 per annum. Therefore there were substantial variations in aid across time.

To determine the impact of changes in financial aid on first year exam results, an ordered probit was estimated using the access program students only. The marginal effects on exam performance of having entered university in a "higher value" year relative to entering in a "lower value" year are shown in Table 13. Although the estimated results follow a pattern suggesting that the extra funding was beneficial, the first year outcomes for students who received the high value package were not statistically different from the students who received the lower value package. Furthermore no significant effects of the extra funding were detected when alternative

models were estimated.[21] Clearly this does not suggest that AP's financial package has no effect on student performance, however it does imply that increasing the value of the package from an average of €5407 to €6313 per annum (a difference of €906) did not lead to changes in student achievements. The analysis rests on the assumption that there were no other differences in the AP's activities in these high value years that may influence outcomes. It also assumes that the unobserved characteristics of students in the high value years did not differ from students in low value years.

F. *Expansion of the AP*

The AP is currently operating on a relatively small scale, representing less than 5% of all university entrants. The effectiveness of the program, as demonstrated in this study, calls into question the possibility of expanding the program to include more students. Currently the program does not accommodate low income students who attend high schools which are not classified as disadvantaged, and hence are not linked to the program. Table 14 shows the treatment effects of the program when comparing both Treatment groups to an alternative Control group of low income students attending non disadvantaged schools. The results show that the Treatment students typically outperform this new Control group in regards improved first year exam performance and progression rates to second year. Thus as these results are largely positive it suggests that expanding the program to non disadvantaged schools may be beneficial.

[21] The results of these alternative models are available on request from the authors.

V. Conclusion

The study examines the effectiveness of a multidimensional access program (AP) operating at a large Irish university. While there is some evidence that such programs can be effective (e.g. Angrist et al. 2009; Brock and Richburg Hayes 2006), there is a dearth of research in this area, particular in a non-North American setting. Overall the results indicate that participation in the Irish AP has well determined and significant positive benefits for low SES students.

The results illustrate that program has a positive effect on progressing to second year for both low and high ability Discount students. Withdrawal from a degree may have long lasting self-esteem and stigmatizing effects particularly if the student has miscalculated their relative ability to finish the program. The program also improves the exam performance of both Discount and Merit treated students, in that it increases the probability of achieving an honours and reducing the probability of either passing or failing. Yet these results are primarily driven by female students and higher ability students. AP students who attained more than 400 points in their university entrance exam are more likely to achieve a second class honours grade and less likely to receive a third class honours or fail their first year exams. The AP appears to shift the entire distribution of grades upwards for the high point program participants.

The positive effects of the AP on the students' final year outcomes suggest that the program has a persistent effect throughout university. The program increases the graduation rate for both Discount and Merit students by between 10 and 15%. These effects are very large and represent the cumulative effect of the program in reducing drop-out at each stage of university life. However, while the program helps the students to make it to graduation, it has no impact on their final degree result classification or the probability that they will graduate on time.

In general, the results show differential effects for high and low ability, with students achieving over 400 points in their university entrance exam having improved performance in the first year exams. This result was not expected *ex ante* as it was hypothesized that the supports of the AP would act as a substitute for the low ability students, in that the additional classes and financial aid would compensate for their low ability. Yet the contrary results suggest that the high ability students may be better able to take full advantage of the services offered by the AP, such as the free additional tutorials, and as such the AP acts as a complement for these students, rather than a substitute.

Given that we find the program has a positive impact overall on the students that received preferential entry treatment (i.e. those that were allowed enter with a lower score in the university entry exam), affirmative action or positive discrimination does not appear to compromise academic standards. Although the program utilizes a quota for lower socio-economic students, it maintains academic standards through its screening process which uses more information on prior academic performance than the standard screening procedure for the general population. This suggests that relying on university entrance exam grades lone may not be an accurate marker for university success. However there are administrative and cost burdens to both the university and the applicants with such a process that may prohibit its extension to the general population. Note that the positive discrimination made by the AP occurs on a relatively small scale both in terms of the absolute number of students admitted and the level of grade remission that an individual student receives. While eligibility for US affirmative action programs typically depend on ethnicity, this study shows the effectiveness of a program based instead on socio-economic status.

The study also finds that a high level of financial aid may not be the main contributor of university success as variation in aid over time does not adversely impact on student performance. However there are limits as to how much one can extrapolate from this result. Firstly it should be noted that the sample size used for this analysis is quite low as only AP students can be included; therefore the estimated results may not be precise. Secondly, based on the data available, it is not possible to speculate with any degree of confidence if an increase by more than around €900 would have had any effect. Nor is it possible to estimate if a reduction in the value of the financial package below an amount of around €5400 would have any effect on average student performances. However in reducing the amount of financial aid to students, consideration should be given to the possible effects of such a reduction on student employment as students may enter part-time employment to offset a reduction in financial aid (although there is currently no consensus in the literature on the effects of student employment on academic outcomes).

The program is currently operating on quite a small scale, therefore given its positive effects, one may speculate on whether it should be expanded to different populations. One of the criteria for participation in the program is parental education: students must be the first generation of their family to attend university education. Given the overall positive effects of the program, this initiative has the potential to reduce the comparatively high inter-generational correlation in education found in Ireland. Our additional analysis suggests that the current AP students perform better than other disadvantaged students who meet in the income, education and social class eligibility criteria but do not participate in the access program as their school is not linked. In other words, for these students, coming from an "advantaged" school does not

compensate for not entering the AP. It therefore follows that allowing such students to participate in the access program, may help to further address the inequality.

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Descriptive Statistics

Table 1 Labour Market Characteristics in AP School Localities by Year of Linkage

Year of linkage to AP	Number of schools entering program	Proportion in locality unemployed in 1996	Proportion in locality leaving education before age 18 in 1996
1999 or before	21	0.11 (0.03)	0.90 (0.06)
2000	6	0.06 (0.02)	0.87 (0.08)
2001	125	0.09 (0.04)	0.86 (0.09)
2002	30	0.09 (0.03)	0.88 (0.06)
2003	68	0.08 (0.03)	0.87 (0.05)
2004 or later	60	0.09 (0.03)	0.89 (0.06)

Note: Mean, standard deviation (in parentheses) and sample size reported. The figures represent the average labour market conditions, as reported in the 1996 Census, in the locality of the schools which joined the AP between 1999 and 2005. The number of observations (at school level) are weighted by number of students from school in final sample. No school has left the access program having been chosen to join it.

Table 2 Average University Entrance Exam Grades for Control and Treatment Group by Year of Linkage

Year of linkage	Control	Treatment
1999	438	429
	(54)	(69)
2000	446	398
	(64)	(70)
2001	433	388
	(50)	(44)
2002	425	416
	(55)	(74)
2003	436	400
	(64)	(65)
2004	424	399
	(61)	(65)
Average	434	404
	(58)	(66)

Note: Mean, standard deviation (in parentheses) reported. The average university entrance exam grades are based on final school exams consisting of 6 exams worth 100 points each, for a maximum score of 600 points.

Figure 1 University Faculty by Control and Treatment Group Before and After the 2001 Reform

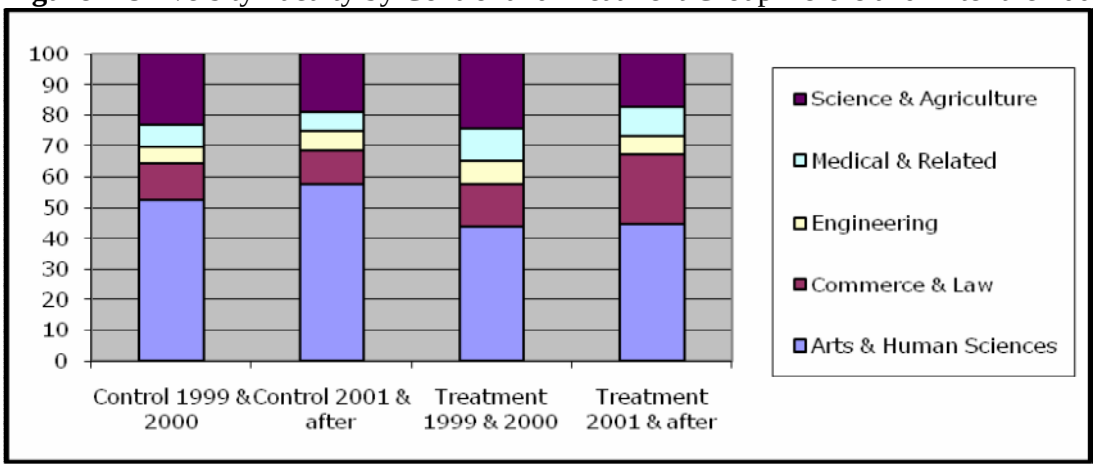

Table 3 University Entrance Exam Grades

Points categories	**General Student Population**	**Control group Students**	**Discount AP students**	**Merit AP students**
	%	%	%	%
300-350	3.12	3.12	37.28	9.4
355-400	21.38	31.43	34.32	33.56
405-450	27.75	34.81	8.28	23.49
455-500	23.06	16.62	15.98	20.13
505-550	15.65	8.57	4.14	9.4
555-600	9.05	5.45	0	4.03
Sample size	16,337	385	173	149

Note: The Control group includes grant holders, went to link schools before they became linked, year of link available, parents not managers, professionals or farmers.

Table 4 Outcome Variables

Outcome Variables	**General Student Population**	**Control group Students**	**Discount AP students**	**Merit AP students**
First Year Outcomes:	%	%	%	%
First Class in Summer Exams	8.89	2.99	2.98	10.34
Upper Second Class in Summer Exams	16.31	13.04	10.12	13.1
Lower Second Class in Summer Exams	21.68	23.1	14.29	28.28
Third Class in Summer Exams	23.77	31.52	22.62	21.38
Fail in Summer Exams	29.35	29.35	50	26.9
Passed Autumn Exams	69.32	69.23	68.75	57.58
Progressed to Second Year	88.35	88.01	82.74	86.21
Sample size	16,337	385	173	149
Final Degree:				
Graduated	77.5	79.53	77.42	88.89
Graduating on time	89.48	88.65	92.86	92.21
First Class Honours Degree	13.78	8.51	4.29	20.51
Upper Second Class Honours Degree	29.07	25.96	18.57	29.49
Lower Second Class Honours Degree	38.1	45.11	45.71	30.77
Third Class Honours Degree	19.05	20	31.43	19.23
Sample size	11,921	298	93	90

Note: The Control group includes grant holders, went to link schools before they became linked, year of link available, parents not managers, professionals or farmers.

Table 5 Year Student Entered University

Year	**General Student Population**	**Control group Students**	**Discount AP students**	**Merit AP students**
	%	%	%	%
1999	16.56	18.96	6.36	10.07
2000	16.81	15.84	10.98	8.05
2001	16.55	21.3	9.83	9.4
2002	17.02	16.62	15.03	24.16
2003	16.01	12.47	22.54	20.13
2004	17.05	14.81	35.26	28.19
Sample size	16,337	385	173	149

Note: The Control group includes grant holders, went to link schools before they became linked, year of link available, parents not managers, professionals or farmers.

Table 6 Socio-demographic Characteristics

Socio-demographic characteristics	General Student Population	Control group Students	Discount AP students	Merit AP students
	%	%	%	%
Male	45.98	34.55	36.42	40.27
In receipt of means tested State grant	16.94	100	100	100
Socio-economic group of father:				
Farmers	10.77	0.0	0.0	0.0
Agricultural Workers	1.03	1.56	1.15	1.41
Higher Professionals	32.34	0.0	0.0	0.0
Lower Professionals	8.38	0.0	0.0	0.0
Managers and Employers	21.93	0.0	0.0	0.0
Salaried Employees	16.24	32.21	25.29	19.72
Intermediate Workers	1.74	5.97	12.64	8.45
Other non-manual	1.17	7.01	10.34	15.49
Skilled manual	4.98	34.03	24.14	16.9
Semi-skilled manual	0.9	12.21	12.64	16.9
Non-skilled manual	0.52	7.01	13.79	21.13
Sample size	16,337	385	173	149

Note: The Control group includes grant holders, went to link schools before they became linked, year of link available, parents not managers, professionals or farmers.

Table 7 University Faculty

University Faculty	General Student Population	Control group Students	Discount AP students	Merit AP students
	%	%	%	%
Agriculture	5.29	3.38	0.58	4.7
Arts	40.72	50.65	34.1	43.62
Commerce	12.74	6.75	20.81	8.05
Engineering and Architecture	9.46	6.23	6.36	6.04
Interfaculty	4.41	2.86	5.2	1.34
Law	2.99	1.3	2.89	2.01
Medicine	5.85	4.42	13.87	2.01
Science	12.95	17.14	6.36	27.52
Veterinary Medicine	1.81	2.08	1.16	1.34
Human Sciences	3.78	5.19	8.67	3.36
Sample size	16,337	385	173	149

Note: The Control group includes grant holders, went to link schools before they became linked, year of link available, parents not managers, professionals or farmers.

Table 8 Impact of Access Program on First Year Outcomes

	Base			Grades <400			Grades >400		
	All	Discount	Merit	All	Discount	Merit	All	Discount	Merit
First Year Exam Results[a]									
First Class Honours	**0.014****	0.008	0.015	0.001	N/A	0.001	**0.045****	0.039	0.034
	(0.007)	(0.006)	(0.009)	(0.008)	(N/A)	(0.002)	**(0.021)**	(0.031)	(0.022)
Second Class Honours Upper	**0.050*****	**0.047***	**0.048****	0.007	0.002	0.005	**0.086*****	**0.107***	**0.073****
	(0.018)	**(0.027)**	**(0.022)**	(0.009)	(0.009)	(0.011)	**(0.027)**	**(0.063)**	**(0.031)**
Second Class Honours Lower	**0.055*****	**0.051***	**0.046****	0.026	0.009	0.018	**0.023****	**0.024****	**0.024****
	(0.019)	**(0.028)**	**(0.019)**	(0.032)	(0.042)	(0.037)	**(0.010)**	**(0.011)**	**(0.010)**
Pass/Third Class	**-0.013***	-0.008	**-0.028***	0.018	0.007	0.009	**-0.059*****	-0.067	**-0.061****
	(0.007)	(0.008)	**(0.015)**	(0.023)	(0.034)	(0.018)	**(0.020)**	(0.045)	**(0.029)**
Pass in Autumn repeats	**-0.054*****	**-0.052**	**-0.041****	-0.015	-0.005	-0.010	**-0.056*****	**-0.065***	**-0.039****
	(0.019)	**(0.029)**	**(0.019)**	(0.018)	(0.026)	(0.021)	**(0.020)**	**(0.036)**	**(0.018)**
Fail	**-0.053*****	**-0.046***	**-0.039****	-0.037	-0.013	-0.023	**-0.040*****	**-0.039****	**-0.031****
	(0.019)	**(0.024)**	**(0.017)**	(0.047)	(0.060)	(0.046)	**(0.015)**	**(0.019)**	**(0.014)**
Sample size	680	535	512	303	241	183	377	294	329
Progression to Second Year[b]	**0.053****	**0.112****	0.029	0.096	**0.158***	0.070	0.040	**0.111***	0.008
	(0.026)	**(0.044)**	(0.030)	(0.058)	**(0.083)**	(0.069)	(0.038)	**(0.060)**	(0.043)
Sample size	706	557	533	321	257	196	385	300	337

Notes: [a] Estimated using ordered probit. [b] Estimated using linear probability model. Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is participation in the access program. Discount students are those who entered the university with reduced entry grades. Merit students are those who entered the university without reduced entry grades. The Control group include financially eligible students (i.e. grant holders), whose parents are not professionals or employers and who attended schools that subsequently became linked to the AP. Those from farming backgrounds are excluded. All models include: faculty, year of university entry and university entry exam grades.

Table 9 Impact of Access Program on Final Year Outcomes

	All	Discount	Merit
Probability of graduating[a]	**0.100*** **	**0.148** **	**0.097*** **
	(0.032)	**(0.064)**	**(0.035)**
Sample size	481	391	388
	0.019	0.017	0.014
Probability of graduating on time[a]	(0.032)	(0.057)	(0.036)
Sample size	382	305	310
Final degree classification[b]			
First Class Honours	0.027	-0.007	0.041
	(0.019)	(0.018)	(0.032)
Second Class Honours Upper	0.053	-0.024	**0.061***
	(0.032)	(0.063)	**(0.037)**
Second Class Honours Lower	-0.026	0.006	-0.043
	(0.018)	(0.014)	(0.033)
Pass/Third Class	-0.055	0.025	-0.060
	(0.034)	(0.068)	(0.036)
Sample size	383	305	313

Notes: [a] Estimated with linear probability model. [b] Estimated with ordered probit conditional on sitting final exams. Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is participation in the access program. Discount students are those who entered the university with reduced entry grades. Merit students are those who entered the university without reduced entry grades. The Control group include financially eligible students (i.e. grant holders), whose parents are not professionals or employers and who attended schools that subsequently became linked to the AP. Those from farming backgrounds are excluded. All models include: faculty, year of university entry and university entry exam grades.

Table 10 Impact of Access Program on Student Performance for Students from Limited and Full Pre-Entry Support Schools

	Limited Pre-Entry Supports			Full Pre-Entry Supports		
	All	Discount	Merit	All	Discount	Merit
First year Exams[a]						
First Class Honours	0.020*	0.025	0.016	0.009	0.002	0.013
	(0.010)	(0.019)	(0.014)	(0.007)	(0.006)	(0.012)
Second Class Honours Upper	0.045**	0.058	0.033	0.034	0.016	**0.051***
	(0.022)	(0.037)	(0.027)	(0.022)	(0.035)	**(0.031)**
Second Class Honours Lower	0.038**	**0.046***	0.028	0.035	0.016	**0.035***
	(0.017)	**(0.024)**	(0.020)	(0.023)	(0.035)	**(0.021)**
Pass/Third Class	-0.022	-0.031	-0.019	-0.008	-0.002	-0.031
	(0.014)	(0.027)	(0.019)	(0.006)	(0.005)	(0.019)
Pass in Autumn repeats	-0.045**	**-0.057***	-0.032	-0.035	-0.018	**-0.037***
	(0.020)	**(0.034)**	(0.024)	(0.023)	(0.040)	**(0.022)**
Fail	-0.035**	**-0.041****	-0.026	-0.033	-0.015	-0.032
	(0.015)	**(0.020)**	(0.019)	(0.024)	(0.032)	(0.021)
Sample size	496	447	448	381	285	261
Progression to Second Year[b]	0.033	0.049	0.022	-0.021	0.027	-0.035
	(0.036)	(0.061)	(0.054)	(0.035)	(0.063)	(0.038)
Sample Size	517	467	466	391	292	269
Probability of graduating[b]	0.028	-0.068	**0.095***	0.036	0.119	0.032
	(0.056)	(0.101)	**(0.049)**	(0.040)	(0.093)	(0.044)
Sample size	364	341	344	271	204	198
Final degree classification[a]						
First Class Honours	0.001	0.018	-0.006	0.050**	-0.003	**0.083***
	(0.018)	(0.035)	(0.023)	(0.023)	(0.019)	**(0.044)**
Second Class Honours Upper	0.003	0.043	-0.014	0.103***	-0.012	**0.126*****
	(0.043)	(0.074)	(0.056)	(0.037)	(0.076)	**(0.046)**
Second Class Honours Lower	-0.001	-0.025	0.007	-0.039**	0.002	**-0.088***
	(0.022)	(0.052)	(0.027)	(0.019)	(0.011)	**(0.046)**
Pass/Third Class	-0.002	-0.035	0.013	-0.114***	0.013	**-0.121*****
	(0.039)	(0.057)	(0.052)	(0.043)	(0.084)	**(0.045)**
Sample size	303	281	290	223	167	166

Notes: [a] Estimated with ordered probit. [b] Estimated with linear probability models. Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is participation in the access program. Discount students are those who entered the university with reduced entry grades. Merit students are those who entered the university without reduced entry grades. The Control group include financially eligible students (i.e. grant holders), whose parents are not professionals or employers and who attended schools that subsequently became linked to the AP. Those from farming backgrounds are excluded. All models include: faculty, year of university entry and university entry exam grades.

Table 11 Impact of Access Program on Student Performance Including Controls for School Fixed Effects

Base + School Dummies	All	Discount	Merit
First Year Exam Performance[a]			
First Class Honours	0.005	0.002	0.005
	(0.003)	(0.002)	(0.004)
Second Class Honours Upper	0.039*	0.056	0.040
	(0.022)	(0.038)	(0.029)
Second Class Honours Lower	0.061*	0.097	0.060
	(0.036)	(0.060)	(0.042)
Pass in Autumn repeats	-0.016	-0.019	-0.034
	(0.011)	(0.020)	(0.029)
Pass/Third Class	-0.055*	-0.092	-0.045
	(0.031)	(0.058)	(0.030)
Fail	-0.035*	-0.043*	-0.026
	(0.019)	(0.023)	(0.016)
Sample size	680	535	512
Progression to second year[b]	0.070	0.114	0.045
	(0.046)	(0.078)	(0.058)
Sample size	706	557	533
Probability of graduating[b]	0.151***	0.248**	0.043
	(0.050)	(0.114)	(0.058)
Sample size	480	390	387
Final degree classification[a]			
First Class Honours	-0.001	0.000	-0.001
	(0.007)	(0.003)	(0.009)
Second Class Honours Upper	-0.011	0.014	-0.010
	(0.060)	(0.092)	(0.084)
Second Class Honours Lower	0.002	0.004	0.004
	(0.011)	(0.021)	(0.034)
Pass/Third Class	0.010	-0.018	0.007
	(0.056)	(0.116)	(0.059)
Sample size	383	305	313

Notes: [a] Estimated using ordered probit. [b] Estimated using linear probability models. Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is participation in the access program. Discount students are those who entered the university with reduced entry grades. Merit students are those who entered the university without reduced entry grades. The Control group include financially eligible students (i.e. grant holders), whose parents are not professionals or employers and who attended schools that subsequently became linked to the AP. Those from farming backgrounds are excluded. All models include: faculty, year of university entry and university entry exam grades. Dummy variables for ~160 high schools are also included in the analysis.

Table 12 Impact of Access Program on Student Performance by Labour Market Conditions & Gender

	Controlling for Labour Market Conditions			Male			Female		
	All	Discount	Merit	All	Discount	Merit	All	Discount	Merit
First Year Exam Performance[a]									
First Class Honours	0.015**	0.008	0.018*	0.020	-0.003	0.032	0.008**	0.011	0.006
	(0.007)	(0.006)	(0.010)	(0.016)	(0.006)	(0.028)	(0.004)	(0.008)	(0.004)
Second Class Honours Upper	0.055***	0.048*	0.056**	0.052	-0.021	0.067	0.044***	0.066**	0.036*
	(0.018)	(0.027)	(0.022)	(0.036)	(0.047)	(0.043)	(0.015)	(0.029)	(0.020)
Second Class Honours Lower	0.063***	0.055*	0.053***	0.035	-0.015	0.033*	0.070**	0.103**	0.050*
	(0.020)	(0.029)	(0.019)	(0.022)	(0.034)	(0.019)	(0.027)	(0.043)	(0.027)
Pass/Third Class	-0.015**	-0.009	-0.036**	-0.020	0.004	-0.048	-0.007	-0.012	-0.018
	(0.007)	(0.009)	(0.017)	(0.017)	(0.009)	(0.034)	(0.007)	(0.015)	(0.013)
Pass in Autumn repeats	-0.062***	-0.057*	-0.049***	-0.045	0.021	-0.042	-0.059***	-0.088**	-0.039*
	(0.019)	((0.031)	(0.019)	(0.030)	(0.047)	(0.028)	(0.022)	(0.038)	(0.021)
Fail	-0.056***	-0.046**	-0.043***	-0.042	0.014	-0.043	-0.057***	-0.080***	-0.035**
	(0.018)	(0.023)	(0.016)	(0.029)	(0.032)	(0.026)	(0.019)	(0.029)	(0.017)
Sample size	662	520	496	245	186	184	435	349	328
Progression to second year[b]	0.053**	0.102**	0.037	0.021	0.138*	-0.039	0.065**	0.090*	0.059
	(0.027)	(0.046)	(0.030)	(0.044)	(0.075)	(0.057)	(0.031)	(0.053)	(0.036)
Sample size	688	542	517	255	195	192	451	362	341
Probability of graduating[b]	0.091***	0.133**	0.088**	0.114*	0.185*	0.066	0.102***	0.122	0.119***
	(0.033)	(0.067)	(0.037)	(0.061)	(0.102)	(0.081)	(0.039)	(0.082)	(0.046)
Sample size	466	377	374	157	127	122	324	264	266
Final degree classification[a]									
First Class Honours	0.033	-0.002	0.047	0.031	-0.041*	0.119	0.016	0.028	0.006
	(0.020)	(0.020)	(0.034)	(0.049)	(0.022)	(0.102)	(0.015)	(0.031)	(0.016)
Second Class Honours Upper	0.064*	-0.005	0.067*	0.050	-0.201**	0.112*	0.045	0.090	0.014
	(0.034)	(0.067)	(0.038)	(0.072)	(0.082)	(0.062)	(0.037)	(0.079)	(0.037)
Second Class Honours Lower	-0.032	0.002	-0.050	-0.031	0.006	-0.136	-0.018	-0.042	-0.007
	(0.020)	(0.019)	(0.036)	(0.051)	(0.048)	(0.116)	(0.017)	(0.050)	(0.018)
Pass/Third Class	-0.065*	0.005	-0.064*	-0.049	0.236*	-0.095**	-0.043	-0.076	-0.013
	(0.035)	(0.068)	(0.037)	(0.071)	(0.124)	(0.047)	(0.036)	(0.060)	(0.035)

Sample size	373	296	304	129	104	99	254	201	214

Notes: [a] Estimated using ordered probit. [b] Estimated using linear probability models. Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is participation in the access program. Discount students are those who entered the university with reduced entry grades. Merit students are those who entered the university without reduced entry grades. The Control group include financially eligible students (i.e. grant holders), whose parents are not professionals or employers and who attended schools that subsequently became linked to the AP. Those from farming backgrounds are excluded. All models include: faculty, year of university entry and university entry exam grades.

Table 13 Impact of Variation in Financial Aid on First Year Exam Performance

In first sitting of exams	*New ERA students*
First Class Honours	0.027
	(0.019)
Second Class Honours Upper	0.057
	(0.040)
Second Class Honours Lower	0.064
	(0.049)
Pass/3rd Class in Summer	-0.007
	(0.009)
Pass in Autumn repeats	-0.070
	(0.051)
Fail	-0.071
	(0.050)
Sample size	313

Note: Estimated marginal effects in ordered probit model. Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is being in first year during a high value financial support year (2000, 2001, 2003). The base specification includes faculty and university entry exam grades.

Table 14 Impact of Access Program on Student Performance: AP students versus Disadvantages Studnts in Non-disadvantaged schools

	All
First Year Exam Performance[a]	
First Class Honours	0.020**
	(0.009)
Second Class Honours Upper	0.051**
	(0.020)
Second Class Honours Lower	0.031***
	(0.010)
Pass/Third Class	-0.022**
	(0.010)
Fail	-0.080***
	(0.028)
Sample size	1364
Progression to second year[b]	0.060***
	(0.023)
Sample size	1425

Notes: [a] Estimated using ordered probit. [b] Estimated using linear probability models [a] Marginal effects and standard errors (in parenthesis) reported. Significance levels: *** 1%, ** 5%, * 10%. The treatment effect is participation in the access program. Discount students are those who entered the university with reduced entry grades. Merit students are those who entered the university without reduced entry grades. The Control group include financially eligible students (i.e. grant holders), whose parents are not professionals or employers and who attended schools that subsequently became linked to the AP. Those from farming backgrounds are excluded. All models include: faculty, year of university entry and university entry exam grades.

Appendix

Appendix Table A1 Comparison of British/Irish and North American Grading Systems

US: GPA	**British/Irish: Award**
Greater than or equal to 3.68	First Class Honours
From 3.08 to 3.67 inclusive	Second Class Honours, Grade 1
From 2.48 to 3.07 inclusive	Second Class Honours, Grade 2
From 2.00 to 2.47 inclusive	Pass