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ABSTRACT

Higher Education Funding Reforms: A Comprehensive Analysis of Educational and Labor Market Outcomes in England

This paper investigates the impact of changes in the funding of higher education in England on students' choices and outcomes. Over the last two decades – through three major reforms in 1998, 2006 and 2012 – undergraduate university education in public universities moved from being free to students and state funded to charging substantial tuition fees to all students. This was done in conjunction with the government offering generous means-tested maintenance grants and loans. Using detailed longitudinal micro-data that follows all students attending state schools in England (more than 90 percent of all school-aged children) from lower education to higher education, we document the socio-economic distributional effects of the 2006 and 2012 policy reforms on a comprehensive set of outcomes, including enrolment, relocation decisions, selection of institution, program of study, and performance within university. For a subset of students, we track them after completing higher education, allowing us to study the labor market effects of the policy reforms. Despite the substantial higher education funding reforms, we do not find large aggregate effect on student enrolment or on other margins. Moreover, the small negative impacts found on the enrolment were largely borne on those in higher parts of the wealth distribution – reducing the enrolment gap across socio-economic groups.

JEL Classification: I22, I23, I29, J30

Keywords: higher education, tuition fees, means-tested support, career choices, career outcomes

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1. Introduction

Higher education funding has become one of the most highly debated public policies of recent times. The extent of cross-country variation in the levels of tuition fees charged and the degree of (and conditions for) means-tested financial support is remarkable (OECD, 2011). From no tuition fees and generous financial support in Nordic countries; moderate tuition fees and low levels of financial support across many continental European countries; to high tuition fees and generous financial support in parts of the US and UK. Over the last 20 years, many OECD countries have observed reforms in their funding schemes, while many others are considering future reforms.

One of the most significant reforms in recent times has been the one that took place in the UK. Until 1998, (full-time) undergraduate education in public universities in England and Wales was free of charge to students. However, in response to the declining quality of university education and rising costs, the government reformed the funding of higher education. The initial reform introduced in 1998, was later updated in 2006 and 2012. The reforms had three components: first, the introduction of tuition fees – initially means-tested at £1,000 per year, increasing to £3,000 per year in 2006 for all students and then eventually increasing to £9,000 in 2012; second, the introduction of a loan system that allowed students to (annually) borrow up to the fee amount; and finally, support to low-income students, including means-tested grants of up to £3,700 per year and means-tested loans of up to £5,000 per year. Together these reforms aimed to shift the burden of higher education funding from the taxpayer to the beneficiary – the students themselves.

In this paper, we use detailed longitudinal micro-data on all students in state schools in England to evaluate the short-run and long-run effects of the 2006 and 2012 reforms. The paper aims to provide a comprehensive analysis of the educational and labor market consequences of the English higher education reforms, focusing on its socio-economic distributional effects. Following several cohorts of high school aged students, we can link the data to those entering university and then, eventually – for a sizeable subset of students – track them into the labor market. We then analyze the impact on enrolment, as well as on a number of other margins. Since students might alter their choices relating to higher education that might then have an impact on outcomes, it is important to understand if the reform impacted other dimensions of higher education choices. For instance, the reforms may have implications related to how students sort – both in higher education but also on the labor market. In particular, their choice of institution, its location, and program of study, as well as behavior when in university – such as dropout, year-repetition, and program switching. Finally, we link the impact of the reform to

later outcomes in the labor market, including their employment status, type of contract and earnings.

Over the last two decades, the UK has reduced the amount of direct public expenditure on higher education from 80 percent to around 25 percent (see Figure 1). These changes have not been without controversy. The reforms were introduced in 1998 under a center-left government – the Labour Party – and the subsequent increases occurred under the Conservative Party in 2006 and 2012. However, in recent years opposition parties have decreed in their party manifestos that they would phase out or reverse the reform fees.¹ The suggestion being that these reforms – by shifting towards a fee-paying system – may reduce university access for those from lower-income households. The reformed system, however, also vastly increased means-tested support and reduced the financing constraints to students, making it unclear what the overall effects of the reforms would be for students from less financially advantaged background. For instance, compared with other OECD countries, the UK became the most generous in providing access to public loans, scholarships and grants (see Figure 2).

From a simple theoretical point of view, the predicted effects of higher education reforms on university participation and other outcomes are not entirely clear. For higher socio-economic groups, the absence of means-tested support, suggests that there is an unambiguous increase in the cost of education. However, for medium and lower socio-economic groups, there is an ambiguous effect. Although all students were obliged to pay tuition fees, there was progressivity in upfront costs through increases in means-tested grants. Moreover, there was a release in financing constraints with access to additional loans and protection against personal bankruptcy due to student loans.

We find only very modest effects of reforms on both, the “intensive” and “extensive” margins, which contrast with the large budget savings. Regarding the extensive – participation – margin, we find a reduction in the participation gap among those entering university from higher and lower socio-economic groups. Overall, there is a small decrease in participation in response to the reforms of around one percent under the 2006 reform and no significant effect of the 2012 reform. Moreover, the modest reductions are only present for the highest socio-economic group, while the participation effect on students from medium and lower socio-economic groups is neutral or even slightly positive. On the other outcomes, we continue to see

¹ In the Liberal Democrats manifesto of 2010, it was stated that “We have a financially responsible plan to phase fees out over six years, so that the change is affordable even in these difficult economic times, and without cutting university income.” More recently, the Labour Party manifesto stated that “Labour will reintroduce maintenance grants for university students [scrapped in 2016/17], and we will abolish university tuition fees.”

only small effects. There is a reduction in the distance travelled, suggesting that students seem to compensate increased tuition costs by reducing costs on other dimensions. However, although students from less wealthy households are generally more likely to attend university closer to home, following the reforms they are actually more likely to move further away. The effect on university choice and performance within university is quite mixed – improved completion rates among all students but also increased dropout rates for those from lower socio-economic backgrounds. Finally, we observe marginally improved labor outcomes – in terms of employment status, type of contract, earnings – for those from higher-income households and marginally worse for those from lower-income households.

Overall, however, the most compelling finding is that these extensive reforms in funding higher education had only a small overall economic impact on student enrolment and other outcomes, with little (wealth) distributional effect. The heterogeneous effects do suggest that introducing progressivity in fees and releasing financing constraints have some differential effect across socio-economic groups. However, the findings are mixed and small. For instance, for students from less wealthy households the reforms had relatively little effect on enrolment and on their geographic mobility; however, it has a relatively more negative effect on program completion and on labor market outcomes, such as employment prospects, contract type and earnings.

The education literature has largely focused on the effect of an increase (or decrease) in tuition fees on university enrolment. In the US, studies have shown that a \$1,000 increase in fees decreases enrolment between zero and three percentage points and \$1,000 increase in financial support increases enrolment between zero and six percentage points (Dynarski, 2003; McPherson and Schapiro, 1991; Kane, 1995; Cameron and Heckman, 2001).² Similarly, in Europe, a €1,000 increase in fees decreases the enrolment rate by 0.5 to 4.7 percentage points (Kelchtermans and Verboven, 2010, for Netherlands; Hubner, 2012, for Germany and Nielsen,

² Dynarski (2003) uses a differences-in-differences approach to investigate the effects of an elimination of a student benefit programme in the US in 1982 on university attendance. The findings suggest an increase of \$1,000 in the grant triggered an increased probability of attending college by around 3.6 pp. McPherson and Schapiro (1991) also focus on the US case and find that increases in the net cost of attendance have a negative and statistically significant effect on enrolment rates for white low-income families: a \$1,000 increase in the net costs decreases enrolment by 6.8 percentage points (for both public and private institutions) and by 6 percentage points (for private institutions). Kane (1995) further analyses the role of increases in public tuition in the US on enrolment through exploiting different sources of variation in university costs. He finds that a \$1,000 drop in tuition fees produces about a 4 pp increase in college enrolment. Cameron and Heckman (2001) find that a \$1,000 increase in Pell grant entitlements triggers less than a 1% increase in enrolments, while a \$ 1,000 increase in tuition fees produces a drop of around 6% in enrolments in 2 year colleges, but no effect on enrolment in 4 year colleges.

Sorensen and Taber, 2010 for Denmark).³ For the UK, Dearden, Fitzsimons and Wyness (2014) show that £1,000 increase in financial support increased enrolment by 3.95 percentage points, while Sa (2014) shows that £1,000 increase in tuition fees decreased applications to university by 1.6 percent. More recently, Murphy, Scott-Clayton and Wyness (2017), investigate the system as a whole and descriptively show that the shift to a fee paying system in England resulted in increased funding per head, rising enrolments, and a narrowing of the participation gap between advantaged and disadvantaged students.⁴

Our paper also relates to a literature that studies the effects of changes in the level of other university related outcomes. For instance, Garibaldi et al. (2012) show that an increase by €1,000 in fees decreases probability of late graduation by 5.2 percentage points in Italy. Angrist, Lang and Oreopoulos (2009) show that financial incentives to improve academic performance had a modest effect in Canada. Several studies have highlighted the importance of distance on university enrolment (Card, 1995) and university choice (Long, 2004; Gibbons and Vignoles, 2012).⁵ Finally, there is a growing empirical and theoretical literature that aims to understand the optimal way to finance higher education (see, for instance, Lincoln and Walker, 1993; Salmi, 2003; Jacobs and Wijnbergen, 2007; Del Rey, 2012). The idea being that a well-designed system could, potentially, be both efficient and equitable.

By focusing on a wide series of outcomes, our study offers the first comprehensive analysis on several dimensions of higher education reforms in England. Our paper contributes to the growing literature on higher education financing by providing insight into the impact of the reforms on enrolment, as well as a variety of other outcomes, including geographical

³ Kelchtermans and Verboven (2010) analyse the university participation decision, where and what to study in the region of Flanders. The nested model estimates show that a uniform increase in tuition fees had a small effect on overall participation (only around 0.5 pp), but differential tuition fees imply large substitutions effects across institutions and fields of study. Hubner (2012) explores the effect of the introduction of tuition fees in sixteen German states in 2007 on enrolment rates. The differences-in-differences results show that the introduction of the fees at an annual rate of €1,000 reduced enrolment by 2.7 pp, and once the spill-overs are controlled for the estimated effected increases to around 4.7 pp. Nielsen, Sorensen and Taber (2010) estimate the effect on university enrolment of a change in student aid due to a Danish reform affecting students starting university in 1988 and find that a \$1,000 increase in the stipend increased enrolment rates by 1.35 pp.

⁴ Dearden, Fitzsimons and Wyness (2014) use data from the British Labour Force Survey between 1993 and 2006 on university participation to analyse the impacts of tuition fees and maintenance grants on university enrolment. They find that a £1,000 increase in fees leads to a drop in participation of 3.9 pp. Sa (2014) uses aggregate data to explore variation over time, comparing England and Scotland, to study the effects of changes in tuition on university applications and participation rates. The study shows that an increase in tuition fees decreases the number of university applications, especially for courses with higher earning potential. Enrolment rates also drop, but no evidence of a stronger effect for disadvantaged students is found. Murphy, Scott-Clayton and Wyness (2017) describe in detail the main policy reforms since 1998 and using the British Labour Force Survey between 1992 and 2016, show changes in participation by parents' income.

⁵ Card (1995) proposes that distance is an important determinant of college participation in the US. Gibbons and Vignoles (2012) find that geographical distance has a significant effect on university choice in England, although it does not affect the decision to enrol.

mobility, university choice, choice of field of study, completion rates and labor market outcomes. Using detailed longitudinal data, we follow students from school to university and study the enrolment impacts of reforms, which involved both higher tuition fees and improved access to more financial support for students from lower economic backgrounds. Our rich data allows us to analyse two different reforms – 2006 and 2012 – and also to understand their heterogeneous effects across socio-economic groups.

2. Institutional Framework

In this section, we describe the higher education reforms that took place in England. To help understand the context, we then briefly describe the education system and the process to enter university.

2.1. Higher Education Reforms

Until 1998, students studying for an undergraduate degree – typically three year programs – could attend university free of charge. Starting in the academic year 1998, the government introduced a package reform that included the introduction of tuition fees. Students were obliged to pay a maximum of £1,000 per year, at the beginning of each academic year. However, the amount paid was means-tested, such that the amount paid by each student depended on their family income. In particular, students were exempt from paying fees if the family income was less than £23,000 per year. For students from households where the family income was between £23,001 and £35,000, a reduced amount was paid, while those whose families earned more than £35,001 were charged the full fee. The tuition fee requirements and available support by income group for all regimes are summarized in Table 1.

The Higher Education Act 2004, effective from 2006, changed the tuition regime again with three major changes: first, all students – irrespective of household income – were obliged to pay tuition fees; second, universities were given discretion over the level of tuition fees charged; third, the maximum amount of tuition fee trebled to £3,000 per year (inflation indexed).⁶ Most universities charged the maximum fee permitted of £3,000. In 2010, further reforms were announced. With respect to tuition fees, the most important change being that fees would increase to a maximum of £9,000 per year from 2012.

⁶ Devolution meant that Scotland, Northern Ireland and Wales pursued different policies.

From 2006, tuition fees were no longer means-tested, however, the reforms introduced several systems of support to less financially advantaged students to pay for tuition fees. The most prominent being that all students were eligible to apply for tuition fee loans from a government-backed student loans company – independent of their economic situation. These loans would cover the entire cost of tuition fees and were payable, in instalments, *after graduation* and once their income level exceeded a certain amount. In 2006, this was set at £15,000 and the income threshold for repayments increased to £21,000 in 2012. The loans were repayable with some interest, however, these were very small – 1.25 percent in 2006 and in 2012, the interest rate was set at the maximum of RPI plus 3 percent for graduates earning more than £41,000.⁷

In conjunction with the tuition-fees loan system, the reforms introduced means-tested related support. Means-tested maintenance grants, which stood at around a maximum of £949 in 1998, were then increased substantially to a maximum of £2,700 in 2006 and £3,250 in 2012. Means-tested loans offered zero real interest rate loan of up around £2,400 in 1998, which increased to a maximum of around £4,000 in 2006 and to £5,200 in 2012. Maintenance loans increased for all throughout the reforms, although they were relatively smaller for students who benefited from maintenance grants.

Table 1 summarizes all the fees and the financial support available to students based on their family income level under each of the three fee regimes. We present figures for the first year in which tuition fees were introduced (1998), the first year in which the tuition fees increased up to £3,000 (2006) and the first year with the tuition fees were trebled up to £9,000 (2012).

2.2.English Education System

Full-time education in England is compulsory for all children aged between 5 and 16 years old. The public education system – which covers around 93 percent of children – is organized into five Key Stages (KS). KS set the educational knowledge expected of students at various ages. Evaluations begin with KS 1, when students are aged around 7 years old, and marking the end of compulsory education, KS 4 is taken when students are around 16 years old. KS 4 is the national level examination also known under the name General Certificate of Secondary Education (GCSE). Most students take exams in around ten different subjects.

⁷ In 2006, students would pay 9 percent of the value of the annual income in excess of £15,000. In 2012, students would still pay 9 percent of the value of their annual income, which was in excess of £21,000, but for students earning less than £41,000 the interest rate was smaller, equal to the RPI.

Students have the freedom to choose which, and how many, subjects to take for GCSE, but all students are required to take GCSE English and Math.

At the end of compulsory education, students decide to either finish formal education or continue their studies for two more years, choosing between a vocational or an academic track. For students aiming to go to university, the most common path is to take the final Key Stage – KS 5 – in three or four subjects. These are national level exams, known as the General Certificate of Education Advanced Level (A-levels). The choice of subjects tends to be closely related to the students’ university degree preferences and university admissions are largely determined by the test scores obtained at the A-levels.⁸

When applying to a British university, students choose specific fields of study and their degree can vary in length based on the location and the subjects studied, with most lasting three years in England.⁹ In our study, we focus only on English universities as most of English students – around 95 percent – enroll in an English universities (see Figure 3).

3. Data and Descriptive Statistics

In this section, we first describe the main data sources used in the analysis. We then proceed by presenting some summary statistics and describing the main outcome variables.

3.1.Data

We use individual-level data linking information from three main data sets: The National Pupil Database (NPD), the Higher Education Statistical Agency (HESA) and the Destination of Higher Education Leavers (DLHE). The data covers students who enrolled into university between 2004 and 2013, allowing to us follow cohorts of students affected by the 2006 and 2012 higher education reforms. Around 500,000 students completed compulsory school in English state school each year between 2002 and 2011.

The NPD is provided by the English Department for Education and comprises of an administrative data set of all students enrolled in state schools in England – this represent around 93 percent of all English pupils, the remaining being enrolled in independent schools. We focus on students enrolled in secondary education and use mainly information contained in

⁸ Some universities like Cambridge or Oxford also ask prospective students to attend an interview as part of the admission process.

⁹ The application process is centralised and each students applies through UCAS to up to five university-field of study groups. Applications are analysed separately by each institution-department and offers are made conditional on the grades obtained at the A-level exam, which is taken after the university admission process is ended. Students need to choose their top two preferences of the offers received before sitting the A-level and if they meet the grade requirements they can enrol into university. Students that did not meet the thresholds imposed by either of their two options may still find a free spot at university, which did not fill in all their positions by going into clearing.

the Pupil Level Annual School Census (PLASC), which is one of the many data sets included in the NPD. In particular, we use detailed information on the geographical residence of pupils (we have information at lower layer super output area level, totaling around 32,400 areas), variables related to demographic characteristics (for instance, gender and ethnic origins), as well as students' grades obtained at the GCSE.¹⁰ Although the data does not include information on parents' income, the NPD dataset includes information on students' social economic status. In particular, it includes a measure of wealth – the Income Domain Affecting Children Index (IDACI). This indicator is a continuous variable between 0 and 1 that measures the percentage of children aged 0 to 15 years old living in income-deprived families in lower layer super output area.¹¹ For each cohort of pupils finishing their compulsory school, we group pupils into three wealth categories using the terciles of the IDACI score (when in secondary school).¹²

We link the NPD data to the HESA data. The latter contains information about the university and field of study pursued by English students graduating a state secondary school. In total, there are 116 universities.¹³ We have detailed information on fields of study, which we classify into five groups: Medicine, Dentistry and Allied Subjects; STEM; Social Sciences; Languages and History; Arts, Education, Other (See Appendix B for a detailed description). We use the Guardian League Table to define the ranking of the university. We use the yearly published league table ranking around 120 British universities between 2004 and 2013.¹⁴ The HESA data includes information about students' behavior during university. More specifically, we can observe the length of degree completion, whether they dropout from university, whether they switch degree and/or university. The data allows us to measure the degree classification, indicating their performance on the program.

¹⁰ The lower layer super output area covers areas with minimum 1,000 (400) and maximum 3,000 (1,200) individuals (households). There are in total 32,482 lower layer super output areas in England in the period we consider.

¹¹ It should be noted that a household is considered to be income deprived if the household income (before housing costs and without housing benefits) is below 60% of the national median income and if they are receiving any form of income support or benefits. Source: Association of Public Health Observatories, 2012 Deprivation scores. Website: <http://www.makingthelink.net/data-source/deprivation-scores>

¹² Using data on model-based estimates of weekly household income level at middle output area level (provided by the ONS) we calculated that in 2007 the first tercile of the IDACI score (i.e. the wealthiest students in our data) were residents in areas with an average weekly household income of around £800, while those in the second tercile were residents in areas average weekly income of around £660 and those in the third tercile were students living in areas with average weekly incomes of £560.

¹³ In order to control for changes in the supply of places due to university merges, openings or closures, a balanced panel of universities that reported a positive number of enrolled students at undergraduate level over the period 2004/05-2013/14 is considered, totalling 116 universities.

¹⁴ A comprehensive set of criteria is used in the construction of the ranking, including measures of the expenditure per student, staff-student ratio, job prospects, value-added, entry tariff, course satisfaction, teaching quality, feedback

We further link the NPD and HESA data to the DLHE. The DLHE is a survey collecting individual level information on leavers of higher education six months after graduation. The available data allows us to track most of the students who finished their undergraduate degrees between 2006 and 2011 – covering the 2006 reform, but not the 2012 reform. It collects data on the personal characteristics of leavers, the details of their current employment – such as, employment status, the type of contract, earnings – and the further studies they pursued after finalizing their undergraduate studies. The response rate among UK domiciled students is reasonably high (around 80 percent).

This linked data set allows us to follow all students in English states schools from secondary education to post-compulsory education and, in many cases, the labor market. Our analysis is based on information on 10 cohorts of English students who started their undergraduate degree between 2004 and 2013.

3.2.Descriptive Statistics

In Tables 2a and 2b we present the main characteristics of the students in the sample before and after each reform – the 2006 and 2012 reform, respectively. In Table 2a, the first three columns refer to the period before the reform (i.e., the academic years 2004 and 2005) and the first four years under the new fee regime (i.e., the academic years 2006 to 2009). Panel A presents the demographic characteristics and the academic performance of students at the exam taken at the end of compulsory education, the GCSE. On average around 500,000 students sit the GCSE in an academic year. Overall, these characteristics are relatively unchanged before and after the reform. Comparing the ratio of female students before and after the reform, it seems that there has not been a significant change in the gender composition, with around 49 percent of the students being females. Moreover, approximately 86 percent of students are White, with a constant share both before and after the change in tuition fees. As all pupils are required to take GCSEs in English and Math, we focus on these two measures of academic performance. Our summary statistics suggest that there is no change in the average grade for GCSE English before and after the 2006 change in tuition fees, and for Math, the average grade is slightly lower after the reform.

Panel B presents the main outcome variables in our analysis. In the regression analysis, we will quantify, more specifically, the changes before and after each reform. Here, however, we will define the variables and explain how each is measured. The first outcome variable is the *enrolment probability*, which is defined as a categorical variable equal to 1 if a student is

enrolled at age 18 as a first year undergraduate in an English university and 0 otherwise. We see that around 23 percent of students from state schools enroll in university – this seems unchanged before and after the reform.

We next present the outcomes used to measure the geographical mobility of students, focusing only on those who pursue an undergraduate degree in an English university. Our main outcome variable is the *geographical distance*, which is measured as the log kilometer distance between a student's home address at age 16 and the university attended. In order to calculate this distance, we use the coordinates of the centroid of the lower layer super output area, which is the most disaggregated geographical location we have access to, and the geographical coordinates of the university's postcode. We look at two additional geographic measures: whether the student is enrolled in a university located within the *same commuting area* as their home; and the wealth of the area in which the university attended is located, which we define as *rich university*. We use average house prices, measured in each lower layer super output area in the third quarter of each year, which is provided by the ONS.¹⁵ We divide the house prices by quartiles and define the outcome variable as the probability to live in an area with house prices above the median. On average, students who enrolled before the change in tuition fees attend universities that are located at a similar distance from home when compared with those who enroll after the reform, travelling around 47 km. Around 21 percent of students are enrolled in the same commuting areas, independent of the time when they enrolled. The probability that students enrolled in a university located in an affluent area, however, fall from (52 percent) before the reform to (47 percent) after the reform.

Regarding university related outcomes, we construct a measure of university ranking using the Guardian League Tables (as described in the previous section). We focus on enrolment into a *top 10 university* or *top 20 university* – based on the ranking for the previous year (i.e., year of application). We see that around 9 percent study in a top 10 university before the reform, compared with only 7 percent after, while approximately 19 percent students study in a top 20 university, both before and after the 2006 reform.

Our data contains 20 fields of study, but in order to increase the precision of our estimation we group them in 5 wider groups: *Medicine*, *STEM*, *Social Sciences*, *Languages*, and *Arts and Education*. We see that around 30 percent enroll in Social Sciences, followed by

¹⁵ The ONS provides median house prices by middle layer super output area for each quarter. We link this data to the lower layer super output area using the mapping data set provided by the ONS. In order to keep prices constant, we also use the 2004 retail price index.

those in Medicine, Dentistry and Allied subjects and STEM degrees, with shares of around 23 percent and 20 percent, respectively (see Appendix B for a detailed description).

Using the DHLE survey, we also analyze the long-run effects of the 2006 reform. We focus on current status: *employed, unemployed, further studies*. Conditional on being employed, we look at the type of contract: *permanent* versus *temporary*, as well as their earnings – *ln (annual earnings)*. We find that around 63 percent students are employed, around 7 percent are unemployed and 24 percent are pursuing further studies, independent of the fee regime under which they study. Moreover, among those employed, 64 percent are on a permanent contract and 86 percent work full time, earning around £18,900 annually.

Table 2b replicates the structure of Table 2a, to provide the descriptive analysis of the before and after 2012 reform. The first three columns refer to the period before the reform (i.e. the academic years 2008-2011) and the first two years under the new fee regime (i.e. the academic years 2012 and 2013). Panel A provides the characteristics of all students who sat their GCSEs between 2005 and 2009.

Comparing the ratio of female students before and after the reform, it seems that there has not been a change in the gender composition, with around 49 percent of the students being females. Moreover, approximately 85 percent of students are White before the 2012 reform and only 83 percent are White after the 2012 reform. Our summary statistics suggest that there is an increase in both the GCSE in English and in Math test score for those who sat the GCSEs after the 2012 reform.

Panel B presents the outcome variables we are considering in the analysis. The first outcome variable is the enrolment probability and there seems to be a slight drop in the enrolment rate from 27 percent before the new tuition fees regime to 24 percent after the change in tuition fees up to £9,000. Regarding the geographical mobility, on average, students who enrolled before the change in tuition fees attend universities that are located at the same distance from home compared to the ones who enrolled after the reform – travelling around 52km. Furthermore, around 17 percent of students are enrolled in a university located within the same commuting area as their home, independent of the time when they enrolled.

Around 7 percent study in a top 10 university before the reform, and 9 percent study in a top 10 university after the reform. However, after the 2012 reform, the share of students studying in a top 20 university, increased from 15 percent to 17 percent. Regarding the field of study pursued, 30 percent enroll in Social Sciences, followed by those in Medicine, Dentistry and Allied subjects and STEM degrees, with shares of around 24 percent and 21 percent, respectively.

4. Empirical Strategy

We estimate the effect of the higher education reforms on a comprehensive set of outcomes. Using a detailed set of controls, we match cohorts of students that enroll in university in the academic year that they turn 18 years old before each reform, with cohorts of students who have enrolled after the reform. In particular, we estimate separately for each of the 2006 and 2012 reforms:

$$y_{it} = \alpha_0 + \alpha_1 T_{it} + \mathbf{X}_i \alpha_2 + \alpha_3 \ln Cohort\ Size_{it} + time\ trends + FE_r + FE_s + \varepsilon_{it} \quad (1)$$

where y_{it} is the outcome variable (for instance, the probability to enroll into higher education, logarithm of the geographical distance between home and university, university choice, field of study choice, length to completion of program, dropout rate, labor market outcomes). T_{it} is a categorical variable equal to 1 if individual i is enrolled as a first year student in year t after a change in the funding reform and 0 if they are enrolled in on the years before the implementation of the reform. For the 2006 reform, T_{it} takes the value 1 if the academic year t is 2006 to 2009, inclusive, and 0 for years 2004 and 2005. For the 2012 reform, we define T_{it} equal to 0 if the academic year t is either 2008 to 2011, inclusive, and equal to 1 if the academic year t is 2012 or 2013. \mathbf{X}_i represents a vector of individual characteristics (including, gender, ethnicity, wealth index, grades in GCSE English and Math). In $Cohort\ Size_{it}$, controls for changes in the cohort size. We control for time trends, as well as their higher orders. We then include detailed fixed effects at the neighborhood level (FE_r), as well as at the school level (FE_s).

To estimate the differential effect of the reforms on different socio-economic groups, we estimate:

$$y_{it} = \beta_0 + \sum_{g=1}^3 (T * \lambda_g)_{it} + \mathbf{X}_i \beta_4 + \beta_4 \ln CS_i + time\ trends + FE_s + FE_r + \varepsilon_{it} \quad (2)$$

where g represents different terciles of the IDACI score (when the student is in high school). These categories correspond well to the income distribution across neighborhoods in England.

¹⁶ Those in the lowest wealth index category correspond to an average household income of less than or equal to £29,000; those in the middle wealth index category correspond to an

¹⁶Calculated using ONS data on model-based estimates of weekly household income level at middle output area level in 2007.

average household income of around £34,000; and, those in the high wealth index correspond to an average household income of around £43,000 or above.

Overall, the impacts of the reforms are identified by closely matching students from different cohorts before and after the reforms. For instance, since we can identify students at the school level, we can match within school. We conduct several robustness checks – for instance, using different year cut-offs before and after the reform and performing placebo checks – to verify that our main effects hold. These are available on request.

5. Results: 2006 Reform

In this section, we present the main results for the 2006 reform. We begin by investigating the impact of the reform on enrolment among all students, as well as differentially by socio-economic group. We then analyze the impact on other margins among those who enroll. It is important to understand if the reform impacted other dimensions of higher education choices. Students might alter their choices relating to higher education that might then have an impact on outcomes because of their implications related to sorting – both in higher education but also on the labor market. In particular, their choice of institution, its location, and program of study, as well as behavior when in university – such as dropout, year-repetition, and program switching. Finally, we link the impact of the reform to later outcomes in the labor market, including their employment status, type of contract and earnings.

5.1. Enrolment to University

Table 3 presents the results that estimate equation (1) – the effect of the change in the higher education funding in England on enrolment rates. The baseline estimate (Column [1]), without any controls, shows that the 2006 reform actually increased the enrolment rates by 0.6 percent. However, once we control for time trends and changes in cohort size, the overall effect is negative but insignificant (Columns [2] and [3]). Controlling for individual characteristics and neighborhood fixed effects (Columns [4] and [5]), we find that the reform had a small, negative effect on enrolment to university (-0.7 percent). Including school fixed effect, which would essentially compare different cohorts of students from the same school, does not change the estimate (Column [6]). Regarding the other coefficients, it seems that females and top performing students in English and Math are more likely to enroll in university, while White students and those from lower income backgrounds are less likely to pursue an undergraduate degree.

In Table 4 we re-estimate equation (1) separately by socio-economics groups. Interestingly, although the overall effect continues to be very small – the heterogeneity of the effect goes in the direction of having a stronger negative effect on the higher socio-economic group than the middle or lower. The estimated effect is around a 1.6 percent fall in enrolment among the highest group (Column [4]), -0.4 percent for the middle group (Column [5]) and a coefficient that is close to zero for the lowest group (Column [6]). This is likely to reflect that, while tuition fees increase the costs associated with attending university, the means-tested grants and loans protect those from the lower socio-economic groups. In particular, the provision of support, seems to have offsets the effect of tuition fees on university participation. However, it is again important to emphasis that, overall, the effects are small – even along the wealth distribution.

To better understand the change in the enrolment gap across socio-economic groups, in Table 5 we estimate equation (2), which interacts the wealth index with regime change. The analysis indicates that, relative the highest wealth group, the impact of the reform has been weaker on the lower wealth incomes (as shown in Table 4). In turn, suggesting that the 2006 higher education funding reform reduced the gap in enrolment across wealth groups.

Overall, we find that the introduction of charging tuition fees of £3,000 per year to all student, combined with increased means-tested grants and loans reduced enrolment by around less than one percent. Moreover, much of this reduction is borne on those from a higher socio-economic background. One potential explanation for these heterogeneous effects could be that, although the new funding schemes increased the tuition fees considerably, the financing constraints associated with higher education for those from lower socio-economic backgrounds were reduced. In particular, students were given access to means-tested grants of up to £2,700 per year and loans of around £4,000 per year. The non-upfront payment of tuition fees might, in part explain the small magnitudes.

5.2. Geographical Mobility

Although the 2006 reform seems to have had only a small effect on enrolment, it is important to understand the impact on other dimensions. We start by looking at the impact on study-location choice. First, we focus on the geographical distance between a student's home and the university enrolled in. Second, we estimate the effects on the probability to study in a university located within the same commuting area and, finally, we estimate the effect on the likelihood to pursue a degree in an institution located in an affluent area.

Table 6 presents the effects of the changes in the funding of the higher education on various measures of geographical mobility. Columns [1] to [3] present the effects on the linear geographical distance between a student's home (as reported at age 16) and the university enrolled in (expressed in kilometers). Our estimates indicate that the distance to university fell by around 2.7 percent. However, there exists a differential effect when we look across socio-economic groups (Columns [2] and [3]). In particular, while those from a higher socio-economic background are less likely to enroll into a university located further away from home after the reform, the students from less wealthy households are more likely to pursue a degree into a university located further away from home, with a higher magnitude for those in the bottom income distribution. In turn, the gap by wealth in geographical mobility seems to be closing.

In order to understand better the effects of the reforms on students' geographical mobility, we further consider the effects of the new reforms on the likelihood to study in a university located in the same commuting area. Columns [5] to [6] show that the changes in the funding reforms increase a student's probability to pursue a degree in a university located in the same commuting area as a student's home (0.7 percent), with stark differences in the areas students located, depending on economic background. In particular, after the reform, students in the top part of the distribution are more likely to study within the same commuting area than before, while those from the middle and the bottom of the distribution are more likely to study in a university located outside of the commuting areas. These findings are in line with the ones reported earlier, showing that students are more likely to respond to the changes in the funding of higher education by enrolling into universities closer to home.

Finally, we look at university location based on the degree of affluence, as measured by local house prices. This is an interesting aspect to consider since we would expect affluent areas to have stronger local labour markets, which might benefit students when they graduate from university. However, these areas are also likely to be more expensive to live in the short-run as a student. This, therefore, generates a trade-off between short-term costs and (potentially) long-run gains. We define the outcome as the probability to attend a university located in an area with house prices above the median. Columns [7] to [9] of Table 6 show that, on average, it is students from higher socio-economic backgrounds are more likely to locate for university in more affluent areas. However, the 2006 reform did not alter this gap – in particular, it did not deter those from lower socio-economic backgrounds from attending a university in a more affluent location.

Overall, this section provides suggestive evidence of a fall in the wealth gap associated with geographic mobility as a result of the 2006 reform.

5.3. University and Program Choice

In this section, we investigate how the 2006 higher education reform affected the type of university and field of study pursued by students, as well as how it influences students' behavior within university.

5.3.1. University Quality

Using the standardized Guardian League ranking of the university (described in detail in Section 3), we investigate the change in the likelihood to attend a better ranked university as a result of the reform change. Column [1] of Table 7 shows that the 2006 reform had a small positive effect on attending a better ranked university – suggesting small changes in the supply of university places. However, there was a small decrease of attending a higher ranked university among those in the lowest socio-economic background (Column [3]). There seems to be, however, some non-monotonicity in attendance by ranking. While enrolment among this group decreased in top 20 institutions (Columns [8] and [9]), it actually increased in top 10 universities (Columns [5] and [6]). Overall, however, once again the magnitudes and economic significance are small.

5.3.2. Field of Study

Table 8 reports the effects of the 2006 reform on field of study choice. The outcome variable of interest is the probability to pursue one of the main five fields of study defined in Section 3 – Medicine, STEM, Social Sciences, Languages, Arts. Anticipating that tuition fees must later be repaid, students might be inclined to select programs that are associated with higher labor market payoffs or that are more vocational. Overall, we find small effects. It seems that the 2006 had no overall impact on enrolment in Medicine (Column [1]) or STEM programs (Column [3]), increased enrolment into Language (Column [7]) related programs and reduced enrolment in Social Sciences (Column [5]) and Arts (Column [9]). Focusing on the gaps across socio-economic groups, we find quite mixed results. Our findings suggest that, relative to higher socio-economic groups, the 2006 higher education reform increased the probability of students from lower socio-economic backgrounds to pursue Medicine related degree by around one percent (Column [2]). However, the reform reduced the probability of this group to pursue a STEM degree by a similar amount (Column [4]). Relative to other groups, after the reform, the

middle wealth group are less likely to enroll in a Social Science program (Column [6]). The middle and lower socio-economic groups are more likely to enroll in Languages (Column [8]) and, finally, the highest socio-economic group is less likely to enroll in the Arts and Education programs (Column [10]).

5.3.3. Performance within University

We now turn to student behavior in the institution enrolled. In particular, the likelihood of completing the degree program, as well as the length to complete and whether students switch programs. The results are reported in Table 9. Column [1] shows the effects of the 2006 reform on the number of years to complete a degree. Overall, it seems that the length to program increases slightly (1.4 percent). Across the income distribution (Columns [2] and [3]), the gap in completion narrows after the reform, since for the lowest socio-economic group the length of degree is shorter relative to the highest socio-economic group. However, this might, in part be driven by differential selection, since dropout rates among the lower socio-economic groups increases relative to the highest (Columns [8] and [9]). An indication that sorting might have been affected by the reforms relates to the increase in program switching following the reform. In Columns [4] to [6], we see that while there was no overall effect of the reform on students switching program, students from the middle and lowest socio-economic backgrounds are slightly more likely to switch degree programs and those from the highest group are less likely to switch.

To sum up, it seems that once enrolled into an undergraduate degree, students from the lower part of the wealth distribution are more likely to dropout and even switch degree. However, again, the magnitudes are small.

5.4. Labor Market Outcomes

In this section, we connect the effects of the 2006 higher education reform to labor market outcomes. Using the DLHE data, which follows students after they complete their studies in higher education, we investigate the long run effects of the funding changes. We focus on the current work status of the students, measured six months after graduation. If they are working, we look at the type of contract, as well as their earnings.

Table 10 shows that, overall, the reform has a small negative impact on entering employment (0.8 percent) but a small positive effect on engaging in further education (1.3 percent) (Columns [1] and [9], respectively), with no significant impact on unemployment (Column [5]). However, across the distribution there are some differences. In particular, for the

lowest socio-economic group, we do see a relatively lower likelihood of employment (Column [2]) and a higher likelihood of unemployment (Column [6]), as well as a lower likelihood to enter into further education (Column [10]). This suggests an increase in the gap in employment prospects for low versus high wealth groups.

Similarly, Table 11 suggests that, conditional on being employed, the 2006 reform had little overall effect on the types of contract – temporary or permanent (Columns [5] to [12]), however, we do see a reduced likelihood that students will be full-time employed (1.8 percent) (Column [1]). Moreover, the effect is stronger for the lower socio-economic group (Column [2]). This is further reflected in earnings of students after the reform change (Table 12). Overall, earnings increase very slightly (Column [1]). However, the increase is only for the highest socio-economic group (1.5 percent) and there is a negative effect on the middle and lowest group (relative fall by 1.5 and 2.5 percent, respectively).

Although the impact of the 2006 reform on labor related outcomes are small, there do seem to be some differences across the distribution. These differences might be related to the differential behavior with respect to higher education related choices. However, all results are robust to the inclusion of field of study fixed effects and university fixed effects (Columns [3], [4], [7], [8], [11], [12]).

6. Results: 2012 Reform

Although it is too early to study the medium to long-run impacts of the 2012 higher education funding reform, in this section, we briefly analyze some of the short-run impacts – such as enrolment impact, geographical mobility and university choice.

6.1. Enrolment to University

Table 13 presents the results from estimating equation (1) for the 2012 reform. The structure of the table is similar to Table 3. While the estimated effects of the 2012 reform are negative for all estimations, the most saturated estimate, presented in Column [7], indicates that the regime change did not have a statistically significant effect on the enrolment rate.

Overall, the analysis of the two reforms suggests that the change in the funding of higher education had a differential effect depending of the reform: while the 2006 reform dropped enrolment rates by 0.7 percent, the 2012 reform does not seem to have affected the enrolment rates. One potential explanation could be that the 2006 regime prompted a reaction from students affected by the reform. However, as the 2012 regime had a similar format as the 2006 and mainly introduced new levels of the support available, students seem to have already

adapted to the new regime format and follow similar patterns of university enrolment to those before the 2012 reform. Table 14 shows the heterogeneous effects by wealth groups for the 2012 reform. Overall it seems that for the highest socio-economic group, the effect of the reform was the largest, reducing participation by around -0.6 percent (Column [2]). For the middle and lowest group (Columns [4] and [6]), however, there is no statistically significant impact (-0.1 percent and 0.2 percent, respectively). Finally, Table 15 presents findings from estimating equation (2), replicating Table (5) but for the 2012 reform. When comparing across wealth groups, it seems that the new reform closed the gap in the probability to enroll in university by around 1 percent. The closure of this gap is somewhat larger than the 2006 reform (Table 5).

6.2. Geographical Mobility

Table 16 reports the estimates of the effect of the 2012 reform on various measures of geographical mobility. Columns [1] to [3] look at the impact of the reform on the distance between a student's home and the university attended. Similar to the 2006 reform, the results suggest that the 2012 reform had a differential effect by socio-economic groups: while students from the highest socio-economic group enrolled into universities closer to home, the lower groups pursued degree into a university located farther away from home. Columns [4] to [6] present the results for the effects of the new reform on the likelihood to study in a university located in the same commuting area. Our estimates are in lines with the previous ones and with those found after the 2006 reform. In particular, following the reform, students from higher socio-economic backgrounds are relatively more likely to attend a university located within the same commuting area, while those from lower socio-economic backgrounds the less likely. Finally, Columns [5] and [6] investigate whether the reform affected the likelihood to attend a university located in an affluent area. Our findings show that the 2012 reform decrease the likelihood to attend a university located in a rich area for all students, independent of their economic background, with a larger effect found for those in the lower parts of the wealth distribution.

6.3. University and Program Choice

Table 17 shows that, following the 2012 reform, overall, students are likely to attend a better ranked university (Column [1]). This is similar across wealth groups. This effect can be seen when looking at the likelihood to enroll into a top 10 or 20 university (Column [4] and [7]). Table 18 shows how the choice of fields of study changed due to the 2012 reform. The

format of the table is similar to Table 8. Overall, there seems to have been little effect of the reform on field of study choice. As with the 2006 reform, the effects on Medicine and STEM are statistically insignificant, and there is a small increase in pursuing Language based programs, and a small decrease in pursuing Social Sciences. Across the wealth distribution, the effects are small and mostly insignificant.

7. Conclusion

Despite its growing interest, the intended (and unintended) consequences of the introduction of, and increase in, tuition fees have been unclear. In this paper, we estimate the short and long run effects of major reforms in higher education financing that took place in recent years in England in 2006 and 2012. Overall, we find small negative effects on participation. In particular, the change from charging (means-tested) £1,000 per year to £3,000 a year to all students, reduced participation 0.7 percent. The changing from £3,000 to £9,000 per year, had an insignificant negative effect on participation of -0.2 percent. Moreover, any decreases are borne mostly on those from the higher parts of the distribution. With respect to other margins: geographic mobility, university choice, field of study choice, length to completion of the program, (short-run) labor market impacts, we also find small effects. For instance, it seems that students do select universities that are marginally closer to home and, hence, suggesting they readjust on dimensions other than participation. However, again, these differences do not seem to negatively impact students from lower socio-economic backgrounds more.

The modest effects of the English higher education funding reforms on the “intensive” and “extensive” margins contrast with the large budget savings. Part of the explanation for why the effects are small might relate to the structure of the system, which allows students to enrol at no ex-ante financial cost – reducing the barriers to entry. Moreover, by introducing progressivity in fees through a system of means-tested grants and loans, students from lower-income household additionally experience a release financing constraints.

However, one key question is whether these reforms are cost effective in the longer run. Higher education is a risky investment and the student loans to which students in England have access to include some insurance. In particular, graduates repay tuition fees only once they have attained a predetermined income threshold. With respect to the 2006 and 2012 reform, this stood at a threshold of around £15,000 and £21,000, respectively. Moreover, any remaining debt would be written-off after 30 years. This suggests that some graduates will never be able to repay their loan in full. Although it is still too early to estimate the repayment rates for those

affected by the 2012 reform, studies have projected estimate that, under the 2012 regime, 73 percent of graduates will not repay their debt in full within the repayment period, compared with only 32 percent under the 2006 regime (Crawford and Jin, 2014). However, with respect to equity, the system of free higher education is likely to be regressive since more than 50 percent of high school graduates do not go to university and those come, disproportionately, from low-income households. In the absence of a graduate tax (in the form of deferred repayments), higher education is typically absorbed into general taxation. An important next step would be to understand if, and by how much, the change in the tax system redistributes from lower to higher income individuals.

The results suggest that the reforms did not negatively impact university enrolment among students from lower socio-economic groups. It might be that a budget-neutral reform that increases fees and channels these funds to means-tested support can, potentially be effective. Moreover, actions that reduce financing constraints and that link repayment to future income can be a cost-effective way to foster university education. However, it is important to look deeper at the wealth distribution – while the system might have adversely affected students on the margin from entering university, the system could potentially be improved to promote attendance among those lower in the distribution.

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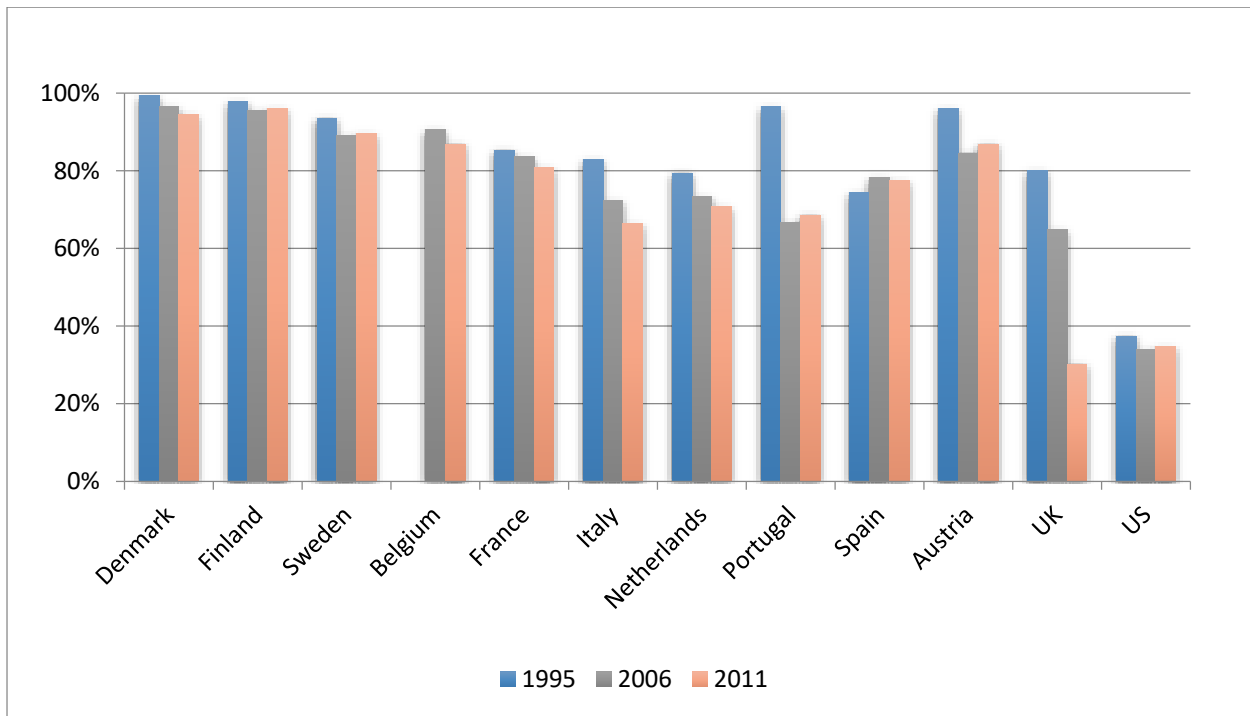
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Figures and Tables

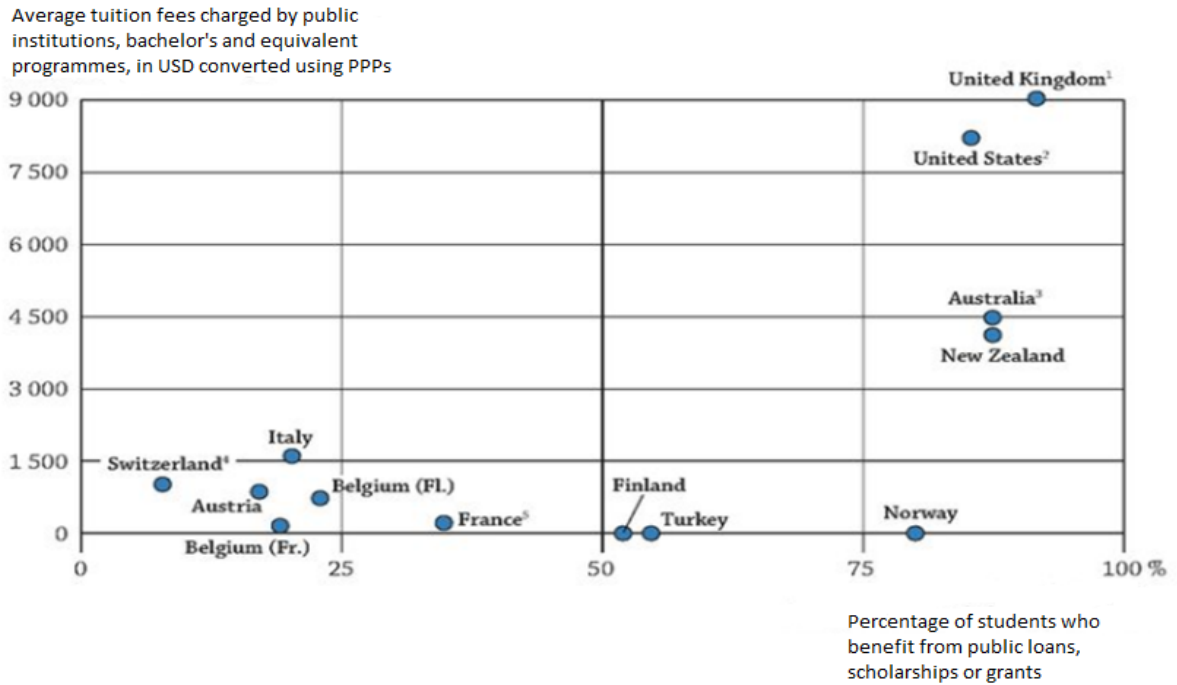
FIGURE 1: SHARE OF HIGHER EDUCATION COSTS COVERED BY PUBLIC EXPENDITURE



Notes: The graph shows the trends in the share of higher education costs, covered by public expenditure across different countries.

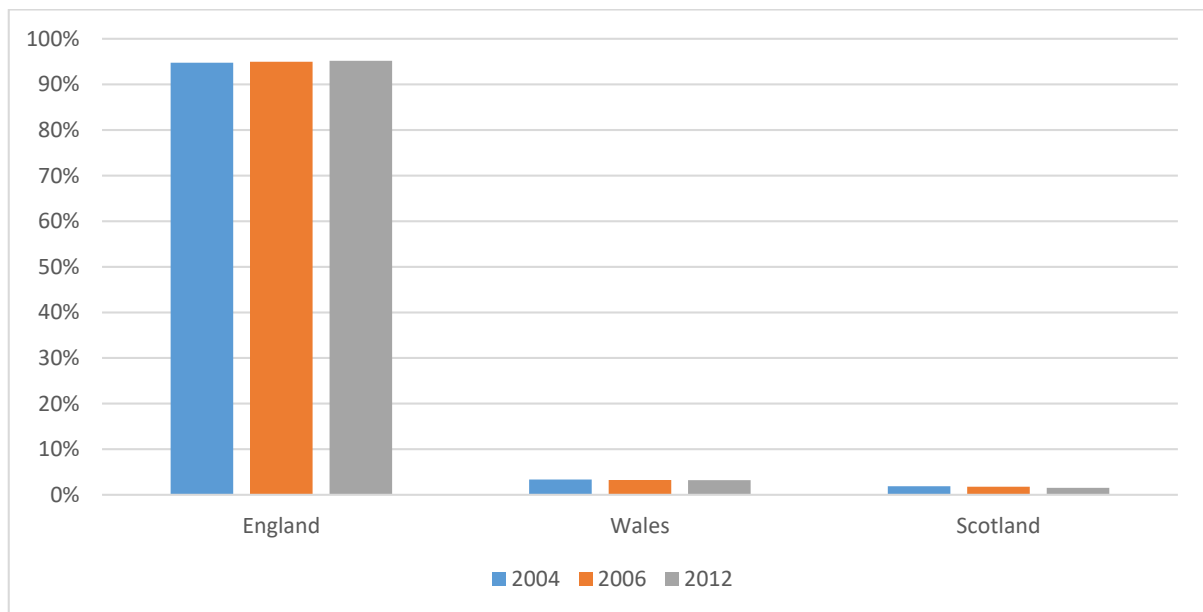
Source: OECD Indicators, 2013, 2014, 2015

FIGURE 2: TUITION FEES VERSUS MEANS-TESTED SUPPORT IN 2013



Notes: The graph plots the relationship between the average tuition fees charged by public higher education institutions in different OECD countries in academic year 2013/14 against the percentage of enrolled students who benefit from public loans, scholarships or grants at bachelor's or equivalent level. It refers to full-time nation students only and the level of tuition fees is expressed in USD converted using the PPPs for GDP.
Source: OECD Indicators, 2013.

FIGURE 3: PERCENTAGE OF FULL TIME FIRST DEGREE UNDERGRADUATE ENGLISH DOMICILED STUDENTS BY REGION OF UNIVERSITY



Notes: The plot shows the share of English full time UG students enrolled in English, Welsh and Scottish universities.

Source: HESA statistics 2006/07, 2012/13

TABLE 1: AVAILABLE SUPPORT BY INCOME GROUP UNDER ALL THREE FEE REGIMES

| Parental income (£) | Tuition fees (£) | | | Maintenance grants (£) | | | Max maintenance loans (£) | | |
|---------------------|------------------|-------|-------|------------------------|-------|-------|---------------------------|-------|-------|
| | 1998 | 2006 | 2012 | 1998 | 2006 | 2012 | 1998 | 2006 | 2012 |
| <=10,000 | 0 | 3,000 | 9,000 | 949 | 2,700 | 3,250 | 2,255 | 3,205 | 3,875 |
| 20,000 | 373 | 3,000 | 9,000 | 949 | 2,284 | 3,250 | 2,255 | 3,205 | 3,875 |
| 30,000 | 1,172 | 3,000 | 9,000 | 569 | 832 | 2,341 | 2,315 | 3,573 | 4,330 |
| 40,000 | 1,172 | 3,000 | 9,000 | 0 | 0 | 523 | 2,403 | 4,172 | 5,239 |
| 50,000 | 1,172 | 3,000 | 9,000 | 0 | 0 | 0 | 2,403 | 3,305 | 4,788 |

Notes: The figures for maintenance grants and maintenance loans refer to students who do not study in London and do not live at home with their parents. Source: Student Loan Company

TABLE 2a: SUMMARY STATISTICS

| | 2006 HE Reform | | | | | |
|------------------------------------|---------------------------------|-------|--------|--------------------------------|-------|---------|
| | Before reform (2004/05-2005/06) | | | After reform (2006/07-2009/10) | | |
| | Mean | Sd | N | Mean | Sd | N |
| Panel A: controls | | | | | | |
| Female | 0.486 | 0.500 | 908005 | 0.487 | 0.500 | 1920422 |
| White | 0.850 | 0.357 | 908005 | 0.856 | 0.351 | 1920427 |
| High Wealth Index | 0.318 | 0.466 | 908005 | 0.319 | 0.466 | 1920427 |
| Medium Wealth Index | 0.335 | 0.472 | 908005 | 0.336 | 0.472 | 1920427 |
| Low Wealth Index | 0.346 | 0.476 | 908005 | 0.346 | 0.476 | 1920427 |
| GCSE English [std] | -0.101 | 1.024 | 872673 | -0.104 | 1.022 | 1856155 |
| GCSE Maths [std] | -0.094 | 1.020 | 885122 | -0.101 | 1.019 | 1868372 |
| Panel B: outcome variables | | | | | | |
| Enrolment | 0.233 | 0.423 | 908005 | 0.239 | 0.426 | 1920427 |
| Ln (Distance between Home and Uni) | 3.849 | 1.273 | 211295 | 3.849 | 1.260 | 459037 |
| Same commuting area | 0.206 | 0.404 | 211295 | 0.201 | 0.400 | 459038 |
| Rich University | 0.519 | 0.500 | 211295 | 0.469 | 0.499 | 459038 |
| Top 10 University | 0.089 | 0.284 | 205533 | 0.066 | 0.248 | 445122 |
| Top 20 University | 0.193 | 0.395 | 205533 | 0.189 | 0.392 | 445122 |
| Study Medicine | 0.223 | 0.417 | 211295 | 0.237 | 0.425 | 459038 |
| Study STEM | 0.205 | 0.403 | 211295 | 0.204 | 0.403 | 459038 |
| Study Social Science | 0.304 | 0.460 | 211295 | 0.305 | 0.461 | 459038 |
| Study Languages | 0.132 | 0.338 | 211295 | 0.120 | 0.324 | 459038 |
| Study Art or Education | 0.136 | 0.343 | 211295 | 0.134 | 0.341 | 459038 |
| Employed | 0.631 | 0.482 | 151701 | 0.632 | 0.482 | 332385 |
| Unemployed | 0.07 | 0.255 | 151701 | 0.078 | 0.268 | 332385 |
| Further Studies | 0.236 | 0.425 | 151701 | 0.233 | 0.422 | 332385 |
| Perm Contract | 0.642 | 0.479 | 83067 | 0.621 | 0.485 | 195429 |
| Full time employed | 0.861 | 0.346 | 95845 | 0.798 | 0.401 | 210120 |
| Ln (annual earnings) | 9.841 | 0.291 | 46906 | 9.846 | 0.301 | 110482 |

Notes: The variables in panel A refer to all students in English state schools who sat the GCSEs between 2001/02-2002/03 (the period before the reform) and between 2003/04-2006/07 (the period after the reform). The outcome variables presented in panel B refer only to students enrolled in a university in England at age 18, except for the enrolment variables which includes both students who did not enroll into university and those who enrolled at age 18 in an English university.

TABLE 2b: SUMMARY STATISTICS

| | 2012 HE Reform | | | | | |
|---|------------------------------------|-------|--------|-----------------------------------|-------|---------|
| | Before reform (2008/09-2011/12) | | | After reform (2012/13-2013/14) | | |
| | Mean | Sd | N | Mean | Sd | N |
| Panel A: controls | | | | | | |
| Female | 0.486 | 0.500 | 988675 | 0.489 | 0.500 | 1049260 |
| White | 0.853 | 0.354 | 988676 | 0.830 | 0.375 | 1049265 |
| High Wealth Index | 0.326 | 0.469 | 988676 | 0.328 | 0.470 | 1049265 |
| Medium Wealth Index | 0.336 | 0.472 | 988676 | 0.335 | 0.472 | 1049265 |
| Low Wealth Index | 0.338 | 0.473 | 988676 | 0.337 | 0.473 | 1049265 |
| GCSE English [std] | -0.077 | 1.019 | 934348 | -0.040 | 1.006 | 1012031 |
| GCSE Maths [std] | -0.078 | 1.018 | 942462 | -0.044 | 1.005 | 1015995 |
| Panel B: outcome variables | | | | | | |
| Enrolment | 0.266 | 0.442 | 988676 | 0.243 | 0.429 | 1049284 |
| Ln (Distance between home & university) | 3.950 | 1.228 | 263031 | 3.962 | 1.238 | 255121 |
| Same commuting area | 0.175 | 0.380 | 263031 | 0.174 | 0.379 | 255121 |
| Rich University | 0.436 | 0.496 | 263031 | 0.738 | 0.439 | 255121 |
| Top 10 University | 0.070 | 0.254 | 252203 | 0.088 | 0.284 | 244873 |
| Top 20 University | 0.145 | 0.352 | 252203 | 0.170 | 0.375 | 244873 |
| Study Medicine | 0.237 | 0.425 | 263031 | 0.239 | 0.426 | 255121 |
| Study STEM | 0.207 | 0.405 | 263031 | 0.207 | 0.405 | 255121 |
| Study Social Science | 0.301 | 0.459 | 263031 | 0.302 | 0.459 | 255121 |
| Study Languages | 0.115 | 0.319 | 263031 | 0.117 | 0.322 | 255121 |
| Study Art or Education | 0.141 | 0.348 | 263031 | 0.135 | 0.342 | 255121 |

Notes: The variables in panel A refer to all students in English state schools who sat the GCSEs between 2005/06-2008/09 (the period before the reform) and between 2009/10-2010/11 (the period after the reform). The outcome variables presented in panel B refer only to students enrolled in a university in England at age 18, except for the enrolment variables which includes both students who did not enroll into university and those who enrolled at age 18 in an English university.

TABLE 3: PROBABILITY TO ENROL INTO UNIVERSITY

| | All | All | All | All | All | All |
|--------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] |
| 2006 HE Reform | 0.006*** [0.001] | -0.005*** [0.001] | -0.006 [0.004] | -0.003 [0.003] | -0.007** [0.003] | -0.007*** [0.001] |
| Trend | | -0.013*** [0.001] | -0.013*** [0.002] | -0.013*** [0.002] | -0.009*** [0.002] | -0.009*** [0.001] |
| Trend Squared | | 0.003*** [0.000] | 0.003*** [0.000] | 0.003*** [0.000] | 0.003*** [0.000] | 0.003*** [0.000] |
| Ln [Cohort Size] | | 0.289*** [0.021] | 0.287*** [0.021] | 0.241*** [0.018] | 0.091*** [0.017] | 0.018 [0.022] |
| Female | | | | 0.078*** [0.004] | 0.030*** [0.004] | 0.030*** [0.001] |
| White | | | | -0.134*** [0.025] | -0.122*** [0.018] | -0.104*** [0.002] |
| Wealth Index [WI] | | | | -0.577*** [0.024] | -0.148*** [0.010] | -0.136*** [0.003] |
| GCSE English [std] | | | | | 0.107*** [0.002] | 0.105*** [0.001] |
| GCSE Math [std] | | | | | 0.131*** [0.005] | 0.125*** [0.001] |
| Constant | 0.233*** [0.000] | -3.611*** [0.279] | -3.578*** [0.277] | -2.773*** [0.239] | -0.825*** [0.223] | 0.153 [0.292] |
| Region FE | No | No | Yes | Yes | Yes | Yes |
| School FE | No | No | No | No | No | Yes |
| Observations | 2,828,432 | 2,828,432 | 2,828,426 | 2,828,421 | 2,713,923 | 2,713,761 |
| R-squared | 0.000 | 0.000 | 0.000 | 0.066 | 0.311 | 0.248 |

Notes: The regressions refer to the 2006 reform and include data on 1st year UG students enrolled between 2004/05-2009/10. The outcome is a categorical variable equal to 1 if the student is enrolled into an English university at age 18 and 0 otherwise. The region FE are defined using the geographical residency of the student at age 16. The school FE are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 4: PROBABILITY TO ENROL INTO UNIVERSITY

| | High | | Medium | | Low | |
|--------------------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Wealth Index | | Wealth Index | | Wealth Index | |
| | [1] | [2] | [3] | [4] | [5] | [6] |
| 2006 HE Reform | -0.012*** | -0.016*** | 0.002 | -0.004* | 0.003 | -0.001 |
| | [0.003] | [0.002] | [0.002] | [0.002] | [0.002] | [0.002] |
| Wealth Index [WI] | -1.512*** | -0.581*** | -0.574*** | -0.208*** | -0.166*** | -0.057*** |
| | [0.039] | [0.026] | [0.013] | [0.010] | [0.004] | [0.004] |
| Trend | -0.017*** | -0.010*** | -0.015*** | -0.013*** | -0.007*** | -0.005** |
| | [0.003] | [0.002] | [0.002] | [0.002] | [0.002] | [0.002] |
| Trend Squared | 0.004*** | 0.004*** | 0.003*** | 0.004*** | 0.002*** | 0.003*** |
| | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Ln [Cohort Size] | 0.400*** | 0.066* | 0.266*** | 0.005 | 0.144*** | -0.038 |
| | [0.042] | [0.038] | [0.035] | [0.034] | [0.030] | [0.029] |
| Female | 0.093*** | 0.032*** | 0.071*** | 0.027*** | 0.047*** | 0.023*** |
| | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] |
| White | -0.072*** | -0.083*** | -0.108*** | -0.112*** | -0.135*** | -0.124*** |
| | [0.005] | [0.003] | [0.004] | [0.003] | [0.003] | [0.002] |
| GCSE English [std] | | 0.160*** | | 0.111*** | | 0.067*** |
| | | [0.001] | | [0.001] | | [0.001] |
| GCSE Maths [std] | | 0.166*** | | 0.123*** | | 0.090*** |
| | | [0.001] | | [0.001] | | [0.001] |
| Constant | -4.850*** | -0.452 | -3.140*** | 0.327 | -1.590*** | 0.857** |
| | [0.561] | [0.505] | [0.475] | [0.448] | [0.398] | [0.393] |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 900,893 | 883,715 | 948,736 | 915,265 | 978,465 | 914,781 |
| R-squared | 0.016 | 0.295 | 0.018 | 0.243 | 0.027 | 0.199 |

Notes: The regressions refer to the 2006 reform and include data on 1st year UG students enrolled between 2004/05-2009/10. The outcome is a categorical variable equal to 1 if the student is enrolled into an English university at age 18 and 0 otherwise. Columns [1] and [2] refer only to students in the high wealth index group; columns [3] and [4] refer only to students in the medium health index group; columns [5] and [6] refer only to students in the low wealth index group. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 5: PROBABILITY TO ENROL INTO
UNIVERSITY

| | All [1] | All [2] |
|--------------------------|----------------------|----------------------|
| 2006 HE Reform | -0.011*** [0.002] | -0.014*** [0.002] |
| 2006 HE Reform * Med. WI | 0.010*** [0.001] | 0.008*** [0.001] |
| 2006 HE Reform * Low WI | 0.017*** [0.001] | 0.015*** [0.001] |
| Medium WI | -0.101*** [0.002] | -0.051*** [0.001] |
| Low WI | -0.183*** [0.002] | -0.074*** [0.001] |
| Trend | -0.013*** [0.002] | -0.009*** [0.001] |
| Trend Squared | 0.003*** [0.000] | 0.003*** [0.000] |
| Ln [Cohort Size] | 0.241*** [0.022] | 0.010 [0.022] |
| Female | 0.069*** [0.001] | 0.030*** [0.001] |
| White | -0.111*** [0.003] | -0.105*** [0.002] |
| GCSE English [std] | | 0.105*** [0.001] |
| GCSE Maths [std] | | 0.125*** [0.001] |
| Constant | -2.810*** [0.299] | 0.261 [0.292] |
| Region FE | Yes | Yes |
| School FE | Yes | Yes |
| Observations | 2,828,094 | 2,713,761 |
| R-squared | 0.032 | 0.249 |

Notes: The outcome is a categorical variable equal to 1 if the student is enrolled into an English university at age 18 and 0 otherwise. The regressions refer to the 2006 reform and include data on 1st year UG students enrolled between 2004/05-2009/10. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 6: GEOGRAPHICAL MOBILITY

| | Distance from home to university | | | Same commuting area | | | University in an affluent area | | |
|--------------------------|-------------------------------------|----------------------|----------------------|---------------------|----------------------|----------------------|--------------------------------|-----------------------|-----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] |
| 2006 HE Reform | -0.027*** (0.008) | -0.039*** [0.008] | -0.048*** [0.008] | 0.007** (0.003) | 0.010*** [0.003] | 0.012*** [0.003] | 0.038*** (0.003) | 0.039*** [0.004] | 0.038*** [0.004] |
| 2006 HE Reform * Med. WI | | 0.005 [0.007] | 0.007 [0.007] | | 0.000 [0.002] | -0.000 [0.002] | | -0.001 [0.003] | -0.001 [0.003] |
| 2006 HE Reform * Low WI | | 0.058*** [0.009] | 0.066*** [0.009] | | -0.018*** [0.003] | -0.020*** [0.003] | | -0.005 [0.004] | -0.003 [0.004] |
| Medium WI | -0.098*** (0.004) | -0.101*** [0.006] | -0.082*** [0.006] | 0.019*** (0.001) | 0.019*** [0.002] | 0.016*** [0.002] | -0.001 (0.001) | -0.000 [0.003] | 0.003 [0.003] |
| Low WI | -0.236*** (0.007) | -0.276*** [0.009] | -0.229*** [0.009] | 0.049*** (0.002) | 0.061*** [0.003] | 0.053*** [0.003] | -0.009*** (0.002) | -0.006* [0.003] | 0.002 [0.003] |
| Trend | 0.011 (0.008) | 0.011 [0.008] | 0.016* [0.008] | -0.001 (0.003) | -0.001 [0.003] | -0.002 [0.003] | -0.095*** (0.005) | -0.095*** [0.005] | -0.094*** [0.005] |
| Trend Squared | 0.001 (0.001) | 0.001 [0.001] | 0.001 [0.001] | -0.001** (0.000) | -0.001** [0.000] | -0.001** [0.000] | 0.010*** (0.001) | 0.010*** [0.001] | 0.010*** [0.001] |
| Ln [Cohort Size] | -0.150 (0.126) | -0.149 [0.126] | -0.049 [0.125] | -0.034 (0.040) | -0.034 [0.040] | -0.053 [0.040] | 1.958*** (0.070) | 1.958*** [0.070] | 1.981*** [0.070] |
| Constant | 5.206*** (1.679) | 5.200*** [1.679] | 3.563** [1.673] | 0.805 (0.534) | 0.808 [0.535] | 1.108** [0.535] | -25.566*** (0.925) | -25.566*** [0.925] | -25.932*** [0.924] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | No | Yes | No | No | Yes | No | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 670,324 | 670,324 | 669,848 | 670,324 | 670,324 | 669,848 | 670,324 | 670,324 | 669,848 |
| R-squared | 0.010 | 0.010 | 0.044 | 0.005 | 0.005 | 0.017 | 0.012 | 0.012 | 0.019 |

Notes: The regressions refer to the 2006 reform and include data on 1st year UG students enrolled between 2004/05-2009/10. The outcome in the first three columns is the geographical distance between the student's home measured at age 16 and the university enrolled in at age 18, expressed in km. The outcome in columns [4] to [6] is a categorical variable equal to 1 if the student is enrolled into a university located in the same commuting area as their residency at age 16. The outcome in columns [7] to [9] is a categorical variable equal to 1 if the university in which the student is enrolled at age 18 is in an area with house prices above the national median. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 7: UNIVERSITY QUALITY

| | University ranking | | | Enrol into a top 10 university | | | Enrol into a top 20 university | | |
|----------------------------|--------------------|-----------|-----------|--------------------------------|-----------|-----------|--------------------------------|-----------|-----------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] |
| 2006 HE Reform | 0.014* | 0.024*** | 0.010 | -0.012*** | -0.014*** | -0.016*** | -0.045*** | -0.042*** | -0.046*** |
| | [0.007] | [0.008] | [0.008] | [0.002] | [0.002] | [0.002] | [0.003] | [0.003] | [0.003] |
| 2006 HE Reform * Medium WI | | -0.007 | -0.002 | | 0.003 | 0.003** | | -0.004 | -0.002 |
| | | [0.006] | [0.006] | | [0.002] | [0.002] | | [0.002] | [0.002] |
| 2006 HE Reform * Low WI | | -0.038*** | -0.022*** | | 0.003 | 0.005*** | | -0.010*** | -0.006** |
| | | [0.008] | [0.008] | | [0.002] | [0.002] | | [0.003] | [0.003] |
| Medium WI | -0.078*** | -0.073*** | -0.032*** | -0.009*** | -0.011*** | -0.004*** | -0.023*** | -0.020*** | -0.008*** |
| | [0.003] | [0.005] | [0.005] | [0.001] | [0.001] | [0.001] | [0.001] | [0.002] | [0.002] |
| Low WI | -0.158*** | -0.132*** | -0.030*** | -0.019*** | -0.020*** | -0.005*** | -0.043*** | -0.036*** | -0.005* |
| | [0.005] | [0.007] | [0.007] | [0.001] | [0.002] | [0.002] | [0.002] | [0.003] | [0.002] |
| Trend | 0.027*** | 0.027*** | 0.035*** | 0.008*** | 0.008*** | 0.009*** | 0.135*** | 0.135*** | 0.138*** |
| | [0.007] | [0.007] | [0.007] | [0.002] | [0.002] | [0.002] | [0.004] | [0.004] | [0.003] |
| Trend Squared | -0.003** | -0.003** | -0.002** | -0.002*** | -0.002*** | -0.002*** | -0.022*** | -0.022*** | -0.022*** |
| | [0.001] | [0.001] | [0.001] | [0.000] | [0.000] | [0.000] | [0.001] | [0.001] | [0.001] |
| Ln [Cohort Size] | 0.323** | 0.323** | 0.499*** | -0.255*** | -0.255*** | -0.228*** | -2.133*** | -2.133*** | -2.079*** |
| | [0.130] | [0.130] | [0.125] | [0.029] | [0.029] | [0.028] | [0.054] | [0.054] | [0.051] |
| Constant | -4.402** | -4.409** | -7.439*** | 3.500*** | 3.502*** | 3.040*** | 28.482*** | 27.544*** | 24.426*** |
| | [1.726] | [1.725] | [1.659] | [0.387] | [0.387] | [0.378] | [0.713] | [0.679] | [0.746] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | No | Yes | No | No | Yes | No | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 650,647 | 650,647 | 650,199 | 650,647 | 650,647 | 650,199 | 650,647 | 650,647 | 650,199 |
| R-squared | 0.007 | 0.007 | 0.207 | 0.004 | 0.004 | 0.073 | 0.008 | 0.008 | 0.126 |

Notes: The regressions refer to the 2006 reform and include data on 1st year UG students enrolled between 2004/05-2009/10. The outcome in the first three columns is the normalized ranking of the university defined using the Guardian League Table. The outcome in columns [4] to [6] is the probability to enroll into a top 10 university, while the outcome in columns [7] to [9] is the probability to enroll into a top 20 university. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 8: PROBABILITY TO PURSUE A FIELD OF STUDY

| | Medicine | | STEM | | Social Science | | Languages | | Arts and Education | |
|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] |
| 2006 HE Reform | 0.001 (0.003) | -0.003 (0.003) | 0.003 (0.002) | 0.008*** (0.003) | -0.007** (0.003) | 0.003 (0.003) | 0.012*** (0.002) | -0.003 (0.002) | -0.005** (0.002) | -0.004* (0.002) |
| 2006 HE Reform * Med. WI | | 0.005* (0.002) | | -0.006*** (0.002) | | -0.007** (0.003) | | 0.006*** (0.002) | | 0.002 (0.002) |
| 2006 HE Reform * Low WI | | 0.011*** (0.003) | | -0.014*** (0.003) | | -0.004 (0.003) | | 0.006*** (0.002) | | 0.001 (0.002) |
| Medium WI | 0.000 (0.001) | -0.002 (0.002) | -0.007*** (0.001) | 0.002 (0.002) | -0.002 (0.001) | 0.002 (0.002) | 0.001 (0.001) | -0.003* (0.002) | 0.009*** (0.001) | 0.001 (0.002) |
| Low WI | 0.001 (0.002) | -0.003 (0.003) | -0.009*** (0.002) | 0.011*** (0.003) | 0.005** (0.002) | 0.004 (0.003) | -0.006*** (0.001) | -0.007*** (0.002) | 0.011*** (0.001) | -0.004** (0.002) |
| Trend | 0.017*** (0.003) | 0.017*** (0.003) | 0.003 (0.003) | 0.003 (0.003) | 0.012*** (0.003) | 0.005 (0.003) | -0.025*** (0.002) | -0.014*** (0.002) | -0.010*** (0.002) | -0.011*** (0.002) |
| Trend Squared | -0.002*** (0.000) | -0.002*** (0.000) | -0.001 (0.000) | -0.000 (0.000) | -0.001*** (0.001) | -0.000 (0.001) | 0.003*** (0.000) | 0.001*** (0.000) | 0.002*** (0.000) | 0.001*** (0.000) |
| Ln [Cohort Size] | -0.181*** (0.045) | -0.201*** (0.045) | -0.135*** (0.041) | -0.189*** (0.041) | -0.465*** (0.050) | -0.337*** (0.049) | 0.492*** (0.035) | 0.396*** (0.035) | 0.341*** (0.036) | 0.331*** (0.036) |
| Constant | 2.539*** (0.607) | 2.779*** (0.606) | 2.179*** (0.543) | 2.819*** (0.550) | 6.493*** (0.666) | 4.909*** (0.650) | -6.421*** (0.459) | -5.270*** (0.461) | -4.456*** (0.481) | -4.237*** (0.477) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 670,324 | 669,848 | 670,324 | 669,848 | 650,647 | 669,848 | 650,647 | 669,848 | 670,324 | 669,848 |
| R-squared | 0.018 | 0.022 | 0.084 | 0.126 | 0.010 | 0.012 | 0.029 | 0.056 | 0.014 | 0.043 |

Notes: The regressions refer to the 2006 reform and include data on 1st year UG students enrolled between 2004/05- 2009/10. In columns [1] and [2] the outcome variable is the probability to pursue a degree in Medicine; in columns [3] and [4] the outcome variable is the probability to pursue a degree in STEM; in columns [5] and [6] the outcome variable is the probability to pursue a degree in Social Science; in columns [7] and [8] the outcome variable is the probability to pursue a degree in Languages and [9] and [10] the outcome is the probability to pursue a degree in Arts or Education. The region FEs are defined using the geographical residency of the student at age 16. The outcome is a categorical variable equal to 1 if the student is pursuing a specific field of study 0 otherwise. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 9: BEHAVIOUR WITHIN UNIVERSITY

| | Length Degree | | | Switch Degree | | | Dropout | | |
|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] |
| 2006 HE Reform | 0.014*** [0.005] | 0.022*** [0.005] | 0.020*** [0.005] | 0.000 [0.001] | -0.010*** [0.001] | -0.011*** [0.001] | 0.001* [0.001] | -0.002*** [0.001] | -0.003*** [0.001] |
| 2006 HE Reform * Medium WI | | -0.006 [0.004] | -0.005 [0.004] | | 0.011*** [0.001] | 0.011*** [0.001] | | 0.003*** [0.001] | 0.002*** [0.001] |
| 2006 HE Reform * Low WI | | -0.036*** [0.006] | -0.034*** [0.006] | | 0.020*** [0.001] | 0.019*** [0.001] | | 0.006*** [0.001] | 0.006*** [0.001] |
| Medium WI | -0.012*** [0.002] | -0.008** [0.004] | 0.000 [0.004] | -0.019*** [0.000] | -0.027*** [0.001] | -0.017*** [0.001] | -0.007*** [0.000] | -0.009*** [0.001] | -0.003*** [0.001] |
| Low WI | -0.019*** [0.003] | 0.006 [0.005] | 0.025*** [0.005] | -0.036*** [0.001] | -0.049*** [0.001] | -0.027*** [0.001] | -0.017*** [0.000] | -0.021*** [0.001] | -0.008*** [0.001] |
| Trend | -0.000 [0.005] | -0.000 [0.005] | 0.002 [0.005] | -0.015*** [0.001] | -0.015*** [0.001] | -0.014*** [0.001] | -0.003*** [0.001] | -0.003*** [0.001] | -0.003*** [0.001] |
| Trend Squared | -0.002*** [0.001] | -0.002*** [0.001] | -0.002*** [0.001] | 0.001*** [0.000] | 0.001*** [0.000] | 0.001*** [0.000] | 0.001*** [0.000] | 0.001*** [0.000] | 0.001*** [0.000] |
| Ln [Cohort Size] | -0.277*** [0.074] | -0.277*** [0.074] | -0.263*** [0.073] | 0.321*** [0.012] | 0.320*** [0.012] | 0.278*** [0.012] | 0.053*** [0.010] | 0.053*** [0.010] | 0.020** [0.010] |
| | 7.197*** (0.979) | 7.195*** (0.979) | 6.841*** (0.966) | -4.158*** (0.160) | -4.150*** (0.160) | -3.579*** (0.164) | -0.635*** (0.131) | -0.633*** (0.131) | -0.201 (0.135) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | No | Yes | No | No | Yes | No | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 552,384 | 552,384 | 552,096 | 2,828,094 | 2,828,094 | 2,713,761 | 2,828,094 | 2,828,094 | 2,713,761 |
| R-squared | 0.009 | 0.009 | 0.031 | 0.008 | 0.009 | 0.038 | 0.001 | 0.002 | 0.015 |

Notes: The regressions refer to the 2006 reform and include data on UG students enrolled between 2004/05- 2009/10. In columns [1] to [3], the outcome variable is number of years it took a student to graduate. In columns [4] to [6], the outcome variable is the probability to switch a degree. In columns [7] to [9] the outcome variable is the probability dropout. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 10: ECONOMIC ACTIVITY

| | Employed | | | | Unemployed | | | | Further Study | | | |
|--------------------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|---------------|-----------|-----------|-----------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] | [12] |
| 2006 HE Reform | -0.008** | -0.005 | -0.004 | -0.003 | -0.002 | -0.004** | -0.005** | -0.005** | 0.013*** | 0.013*** | 0.013*** | 0.012*** |
| | [0.004] | [0.004] | [0.004] | [0.004] | [0.002] | [0.002] | [0.002] | [0.002] | [0.003] | [0.004] | [0.004] | [0.004] |
| 2006 HE Reform * Med. WI | | -0.004 | -0.004 | -0.004 | | 0.003 | 0.002 | 0.002 | | -0.001 | -0.001 | -0.001 |
| | | [0.003] | [0.003] | [0.003] | | [0.002] | [0.002] | [0.002] | | [0.003] | [0.003] | [0.003] |
| 2006 HE Reform * Low WI | | -0.009** | -0.008** | -0.008** | | 0.010*** | 0.011*** | 0.011*** | | -0.007** | -0.007** | -0.008** |
| | | [0.004] | [0.004] | [0.004] | | [0.002] | [0.002] | [0.002] | | [0.004] | [0.004] | [0.004] |
| Medium WI | 0.004** | 0.005* | 0.005 | 0.003 | 0.005*** | 0.002 | 0.002 | 0.002 | -0.005*** | -0.001 | -0.001 | 0.001 |
| | [0.002] | [0.003] | [0.003] | [0.003] | [0.001] | [0.002] | [0.002] | [0.002] | [0.002] | [0.003] | [0.003] | [0.003] |
| Low WI | 0.003 | 0.003 | 0.002 | 0.001 | 0.012*** | 0.003 | 0.003 | 0.002 | -0.012*** | 0.002 | 0.002 | 0.003 |
| | [0.002] | [0.004] | [0.004] | [0.004] | [0.001] | [0.002] | [0.002] | [0.002] | [0.002] | [0.003] | [0.003] | [0.003] |
| Trend | -0.013*** | -0.014*** | -0.015*** | -0.013*** | 0.011*** | 0.011*** | 0.011*** | 0.012*** | -0.004 | -0.003 | -0.004 | -0.005 |
| | [0.004] | [0.004] | [0.004] | [0.004] | [0.002] | [0.002] | [0.002] | [0.002] | [0.003] | [0.003] | [0.003] | [0.003] |
| Trend Squared | 0.004*** | 0.004*** | 0.005*** | 0.004*** | -0.002*** | -0.002*** | -0.002*** | -0.002*** | -0.001 | -0.001 | -0.001 | -0.000 |
| | [0.001] | [0.001] | [0.001] | [0.001] | [0.000] | [0.000] | [0.000] | [0.000] | [0.001] | [0.001] | [0.001] | [0.001] |
| Ln [Cohort Size] | -0.311*** | -0.332*** | -0.344*** | -0.380*** | 0.157*** | 0.146*** | 0.140*** | 0.133*** | 0.205*** | 0.235*** | 0.256*** | 0.290*** |
| | [0.059] | [0.059] | [0.059] | [0.059] | [0.032] | [0.032] | [0.033] | [0.033] | [0.051] | [0.051] | [0.052] | [0.052] |
| Constant | 4.712*** | 5.041*** | 5.247*** | 5.631*** | -1.979*** | -1.815*** | -1.751*** | -1.703*** | 0.261*** | -2.884*** | -3.181*** | -3.490*** |
| | [0.782] | [0.783] | [0.789] | [0.782] | [0.429] | [0.429] | [0.433] | [0.433] | [0.057] | [0.685] | [0.694] | [0.689] |
| Controls | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Education Controls | No | Yes | Yes | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Field of study FE | No | No | Yes | Yes | No | No | Yes | Yes | No | No | Yes | Yes |
| University FE | No | No | No | Yes | No | No | No | Yes | No | No | No | Yes |
| Observations | 484,081 | 483,724 | 474,606 | 474,606 | 484,083 | 483,724 | 474,606 | 474,606 | 484,081 | 483,724 | 474,606 | 474,606 |
| R-squared | 0.005 | 0.008 | 0.012 | 0.026 | 0.001 | 0.008 | 0.010 | 0.013 | 0.001 | 0.008 | 0.010 | 0.024 |

Notes: The regressions refer to the 2006 reform and include data on UG students enrolled between 2004/05- 2009/10 as first years and who graduated. In columns [1] to [4] the outcome variable is a categorical variable equal to 1 if the student was employed 6 months after graduation; the outcome variable in columns [5] to [8] is a categorical variable equal to 1 if the student was unemployed 6 months after graduation; the outcome variable in columns [9] to [12] is a categorical variable equal to 1 if the student was pursuing further studies 6 months after graduation. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. The field of study and university FEs refer to the university and degree from which the student graduated. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 11: CONTRACT TYPES

| | Full Time | | | | Permanent Contract | | | | Temporary Contract | | | |
|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] | [12] |
| 2006 HE Reform | -0.018*** [0.004] | -0.013*** [0.004] | -0.014*** [0.004] | -0.014*** [0.004] | -0.005 [0.005] | -0.001 [0.005] | -0.001 [0.005] | -0.000 [0.005] | 0.001 [0.005] | -0.000 [0.005] | -0.001 [0.005] | -0.002 [0.005] |
| 2006 HE Reform * Med. WI | | -0.008** [0.003] | -0.007** [0.003] | -0.007** [0.003] | | -0.006 [0.005] | -0.004 [0.005] | -0.004 [0.005] | | 0.002 [0.004] | 0.001 [0.004] | 0.001 [0.004] |
| 2006 HE Reform * Low WI | | -0.018*** [0.004] | -0.016*** [0.004] | -0.017*** [0.004] | | -0.008 [0.006] | -0.007 [0.006] | -0.009 [0.006] | | -0.002 [0.006] | -0.004 [0.006] | -0.003 [0.006] |
| Medium WI | -0.010*** [0.002] | -0.002 [0.003] | -0.002 [0.003] | -0.001 [0.003] | 0.010*** [0.002] | 0.011*** [0.004] | 0.012*** [0.004] | 0.010** [0.004] | -0.011*** [0.002] | -0.009** [0.004] | -0.009** [0.004] | -0.007* [0.004] |
| Low WI | -0.021*** [0.003] | -0.002 [0.004] | -0.004 [0.004] | -0.001 [0.004] | 0.024*** [0.003] | 0.022*** [0.005] | 0.022*** [0.005] | 0.021*** [0.005] | -0.024*** [0.003] | -0.012** [0.005] | -0.012** [0.005] | -0.010** [0.005] |
| Trend | -0.022*** [0.004] | -0.021*** [0.004] | -0.023*** [0.004] | -0.025*** [0.004] | 0.019*** [0.005] | 0.019*** [0.005] | 0.018*** [0.005] | 0.020*** [0.005] | 0.029*** [0.005] | 0.030*** [0.005] | 0.031*** [0.005] | 0.028*** [0.005] |
| Trend Squared | 0.002*** [0.001] | 0.002*** [0.001] | 0.003*** [0.001] | 0.003*** [0.001] | -0.005*** [0.001] | -0.005*** [0.001] | -0.005*** [0.001] | -0.005*** [0.001] | -0.008*** [0.001] | -0.008*** [0.001] | -0.008*** [0.001] | -0.007*** [0.001] |
| Ln [Cohort Size] | -0.260*** [0.060] | -0.257*** [0.060] | -0.212*** [0.060] | -0.188*** [0.060] | -0.391*** [0.075] | -0.426*** [0.075] | -0.360*** [0.076] | -0.390*** [0.075] | -0.334*** [0.071] | -0.302*** [0.071] | -0.347*** [0.072] | -0.302*** [0.071] |
| Constant | 4.340*** [0.799] | 4.228*** [0.798] | 3.641*** [0.804] | 3.386*** [0.802] | 5.810*** [1.003] | 6.317*** [1.003] | 5.408*** [1.009] | 5.761*** [1.004] | 4.770*** [0.946] | 4.279*** [0.947] | 4.929*** [0.956] | 4.436*** [0.950] |
| Controls | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Education Controls | No | Yes | Yes | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Field of study FE | No | No | Yes | Yes | No | No | Yes | Yes | No | No | Yes | Yes |
| University FE | No | No | No | Yes | No | No | No | Yes | No | No | No | Yes |
| Observations | 305,961 | 305,762 | 299,247 | 299,247 | 278,492 | 278,298 | 272,192 | 272,192 | 278,492 | 278,298 | 272,192 | 272,192 |
| R-squared | 0.007 | 0.014 | 0.020 | 0.026 | 0.002 | 0.007 | 0.017 | 0.026 | 0.005 | 0.013 | 0.020 | 0.030 |

Notes: The regressions refer to the 2006 reform and include data on UG students enrolled between 2004/05- 2009/10 as first years and who graduated. In columns [1] to [4], the outcome variable is a categorical variable equal to 1 if the student was employed full time 6 months after graduation; the outcome variable in columns [5] to [8] is a categorical variable equal to 1 if the student was working with a permanent contract 6 months after graduation; in columns [9] to [12] the outcome variable is a categorical variable equal to 1 if the student was working with a temporary contract 6 months after graduation. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. The field of study and university FEs refer to the university and degree from which the student graduated. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 12: EARNINGS

| | [1] | [2] | [3] | [4] |
|----------------------------|----------------------|----------------------|----------------------|----------------------|
| 2006 HE Reform | 0.008** [0.004] | 0.015*** [0.004] | 0.013*** [0.004] | 0.011*** [0.004] |
| 2006 HE Reform * Medium WI | | -0.015*** [0.003] | -0.013*** [0.003] | -0.012*** [0.003] |
| 2006 HE Reform * Low WI | | -0.025*** [0.005] | -0.021*** [0.005] | -0.020*** [0.004] |
| Medium WI | -0.011*** [0.002] | 0.004 [0.003] | 0.002 [0.003] | 0.002 [0.003] |
| Low WI | -0.026*** [0.003] | 0.003 [0.004] | -0.002 [0.004] | -0.002 [0.004] |
| Trend | -0.017*** [0.004] | -0.015*** [0.004] | -0.016*** [0.004] | -0.019*** [0.004] |
| Trend Squared | 0.003*** [0.001] | 0.003*** [0.001] | 0.003*** [0.001] | 0.004*** [0.001] |
| Ln [Cohort Size] | 0.304*** [0.064] | 0.316*** [0.063] | 0.353*** [0.062] | 0.388*** [0.061] |
| Constant | 5.860*** [0.853] | 5.621*** [0.835] | 5.138*** [0.827] | 4.758*** [0.808] |
| Controls | Yes | Yes | Yes | Yes |
| Education Controls | No | Yes | Yes | Yes |
| Region FE | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes |
| Field of Study FE | No | No | Yes | Yes |
| University FE | No | No | No | Yes |
| Observations | 157,386 | 157,280 | 153,913 | 153,913 |
| R-squared | 0.020 | 0.051 | 0.088 | 0.125 |

Notes: The regressions refer to the 2006 reform and include data on UG students enrolled between 2004/05- 2009/10 as first years and who graduated. The outcome variable is a categorical the natural logarithm of the annual earnings. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. The field of study and university FEs refer to the university and degree from which the student graduated. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 13: PROBABILITY TO ENROL INTO UNIVERSITY

| | All [1] | All [2] | All [3] | All [4] | All [5] | All [6] |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 2012 HE Reform | -0.012*** [0.001] | -0.018*** [0.001] | -0.017*** [0.002] | -0.014*** [0.003] | -0.002 [0.003] | -0.002 [0.001] |
| Trend | | 0.063*** [0.002] | 0.064*** [0.007] | 0.080*** [0.009] | 0.089*** [0.009] | 0.089*** [0.002] |
| Trend Squared | | -0.005*** [0.000] | -0.005*** [0.001] | -0.007*** [0.001] | -0.008*** [0.001] | -0.008*** [0.000] |
| Ln [Cohort Size] | | -0.434*** [0.027] | -0.438*** [0.048] | -0.500*** [0.052] | -0.500*** [0.049] | -0.495*** [0.031] |
| Female | | | | 0.076*** [0.005] | 0.026*** [0.004] | 0.027*** [0.001] |
| White | | | | -0.155*** [0.013] | -0.126*** [0.008] | -0.108*** [0.002] |
| Wealth Index [WI] | | | | -0.539*** [0.029] | -0.112*** [0.012] | -0.107*** [0.002] |
| GCSE English [std] | | | | | 0.131*** [0.002] | 0.123*** [0.001] |
| GCSE Maths [std] | | | | | 0.121*** [0.004] | 0.115*** [0.001] |
| Constant | 0.255*** [0.000] | 5.850*** [0.366] | 5.913*** [0.625] | 6.899*** [0.667] | 6.835*** [0.636] | 6.768*** [0.408] |
| Region FE | No | No | Yes | Yes | Yes | Yes |
| School FE | No | No | No | No | No | Yes |
| Observations | 3,001,836 | 3,001,817 | 3,001,811 | 3,001,805 | 2,825,449 | 2,825,436 |
| R-squared | 0.000 | 0.001 | 0.001 | 0.058 | 0.306 | 0.245 |

Notes: The outcome is a categorical variable equal to 1 if the student is enrolled into an English university at age 18 and 0 otherwise. The regressions refer to the 2012 reform include date on 1st year UG students enrolled between 2008/09- 2013/14. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 14: PROBABILITY TO ENROL INTO UNIVERSITY

| | High Wealth Index | | Medium Wealth Index | | Low Wealth Index | |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] |
| 2012 HE Reform | -0.021*** [0.003] | -0.006** [0.002] | -0.011*** [0.002] | -0.001 [0.002] | -0.004* [0.002] | 0.002 [0.002] |
| Trend | 0.114*** [0.004] | 0.117*** [0.004] | 0.072*** [0.003] | 0.082*** [0.003] | 0.057*** [0.003] | 0.066*** [0.003] |
| Trend Squared | -0.010*** [0.000] | -0.011*** [0.000] | -0.006*** [0.000] | -0.007*** [0.000] | -0.005*** [0.000] | -0.006*** [0.000] |
| Ln [Cohort Size] | -0.683*** [0.057] | -0.724*** [0.052] | -0.393*** [0.047] | -0.410*** [0.046] | -0.289*** [0.041] | -0.320*** [0.042] |
| Female | 0.084*** [0.001] | 0.027*** [0.001] | 0.067*** [0.001] | 0.024*** [0.001] | 0.053*** [0.001] | 0.026*** [0.001] |
| White | -0.082*** [0.003] | -0.084*** [0.003] | -0.115*** [0.003] | -0.112*** [0.002] | -0.145*** [0.003] | -0.127*** [0.002] |
| Wealth Index [WI] | -1.203*** [0.031] | -0.402*** [0.022] | -0.502*** [0.011] | -0.152*** [0.009] | -0.158*** [0.005] | -0.052*** [0.004] |
| GCSE English [std] | | 0.166*** [0.001] | | 0.126*** [0.001] | | 0.087*** [0.001] |
| GCSE Maths [std] | | 0.147*** [0.001] | | 0.112*** [0.001] | | 0.091*** [0.001] |
| Constant | 9.278*** [0.763] | 9.765*** [0.688] | 5.400*** [0.629] | 5.634*** [0.609] | 4.019*** [0.552] | 4.441*** [0.560] |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 973,496 | 944,466 | 1,006,951 | 953,907 | 1,020,813 | 927,063 |
| R-squared | 0.016 | 0.280 | 0.017 | 0.238 | 0.026 | 0.205 |

Notes: The outcome is a categorical variable equal to 1 if the student is enrolled into an English university at age 18 and 0 otherwise. The regressions refer to the 2012 reform and include data on 1st year UG students enrolled between 2008/09-2013/14. Columns [1] and [2] refer only to students in the high wealth index group; columns [3] and [4] refer only to students in the medium health index group; columns [5] and [6] refer only to students in the low wealth index group. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 15: PROBABILITY TO ENROL INTO UNIVERSITY

| | All [1] | All [2] |
|----------------------------|----------------------|----------------------|
| 2012HE Reform | -0.031*** [0.002] | -0.017*** [0.002] |
| 2012 HE Reform * Medium WI | 0.023*** [0.001] | 0.020*** [0.001] |
| 2012HE Reform * Low WI | 0.037*** [0.002] | 0.026*** [0.002] |
| Medium WI | -0.094*** [0.001] | -0.042*** [0.001] |
| Low WI | -0.168*** [0.002] | -0.058*** [0.001] |
| Trend | 0.073*** [0.002] | 0.087*** [0.002] |
| Trend Squared | -0.007*** [0.000] | -0.008*** [0.000] |
| Ln [Cohort Size] | -0.433*** [0.031] | -0.482*** [0.031] |
| Female | 0.068*** [0.001] | 0.027*** [0.001] |
| White | -0.119*** [0.002] | -0.107*** [0.002] |
| GCSE English [std] | | 0.123*** [0.001] |
| GCSE Maths [std] | | 0.115*** [0.001] |
| Constant | 5.978*** [0.413] | 6.614*** [0.407] |
| Region FE | Yes | Yes |
| School FE | Yes | Yes |
| Observations | 3,001,260 | 2,825,436 |
| R-squared | 0.029 | 0.246 |

Notes: The regressions refer to the 2012 reform include date on 1st year UG students enrolled between 2008/09- 2013/14. The outcome is a categorical variable equal to 1 if the student is enrolled into an English university at age 18 and 0 otherwise. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 16: GEOGRAPHICAL MOBILITY

| | Distance from home to university | | | Same commuting area | | | University in an affluent area | | |
|----------------------------|----------------------------------|-----------|-----------|---------------------|-----------|-----------|--------------------------------|------------|------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] |
| 2012 HE Reform | -0.010 | -0.021*** | -0.027*** | 0.004* | 0.008*** | 0.009*** | -0.374*** | -0.357*** | -0.358*** |
| | [0.007] | [0.008] | [0.008] | [0.002] | [0.002] | [0.002] | [0.005] | [0.005] | [0.005] |
| 2012 HE Reform * Medium WI | | 0.009 | 0.016*** | | -0.005** | -0.006*** | | -0.021*** | -0.020*** |
| | | [0.006] | [0.006] | | [0.002] | [0.002] | | [0.003] | [0.003] |
| 2012 HE Reform * Low WI | | 0.036*** | 0.050*** | | -0.011*** | -0.013*** | | -0.046*** | -0.043*** |
| | | [0.008] | [0.008] | | [0.003] | [0.003] | | [0.006] | [0.006] |
| Medium WI | -0.094*** | -0.097*** | -0.077*** | 0.017*** | 0.019*** | 0.015*** | -0.002 | 0.005*** | 0.008*** |
| | [0.004] | [0.004] | [0.004] | [0.001] | [0.001] | [0.001] | [0.001] | [0.002] | [0.002] |
| Low WI | -0.223*** | -0.235*** | -0.186*** | 0.044*** | 0.048*** | 0.039*** | -0.007*** | 0.008*** | 0.016*** |
| | [0.006] | [0.007] | [0.007] | [0.002] | [0.002] | [0.002] | [0.002] | [0.003] | [0.003] |
| Trend | 0.077*** | 0.077*** | 0.071*** | -0.021*** | -0.021*** | -0.020*** | -0.941*** | -0.942*** | -0.943*** |
| | [0.010] | [0.010] | [0.010] | [0.003] | [0.003] | [0.003] | [0.009] | [0.009] | [0.009] |
| Trend Squared | -0.004*** | -0.004*** | -0.003*** | 0.001*** | 0.001*** | 0.001*** | 0.099*** | 0.099*** | 0.099*** |
| | [0.001] | [0.001] | [0.001] | [0.000] | [0.000] | [0.000] | [0.001] | [0.001] | [0.001] |
| Ln [Cohort Size] | -0.026 | -0.028 | 0.037 | 0.025 | 0.026 | 0.015 | 7.102*** | 7.105*** | 7.116*** |
| | [0.151] | [0.151] | [0.149] | [0.047] | [0.047] | [0.047] | [0.094] | [0.094] | [0.094] |
| Constant | 3.374* | 3.407* | 2.308 | 0.064 | 0.055 | 0.234 | -92.140*** | -92.180*** | -92.349*** |
| | [2.007] | [2.007] | [1.986] | [0.625] | [0.625] | [0.626] | [1.246] | [1.245] | [1.244] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | No | Yes | No | No | Yes | No | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 753,675 | 753,675 | 752,382 | 753,675 | 753,675 | 752,382 | 753,675 | 753,675 | 752,382 |
| R-squared | 0.010 | 0.010 | 0.042 | 0.005 | 0.005 | 0.014 | 0.212 | 0.213 | 0.217 |

Notes: The regressions refer to the 2012 reform and include data on 1st year UG students enrolled between 2008/09-2013/14. The outcome in the first three columns is the geographical distance between the student's home measured at age 16 and the university enrolled in at age 18, expressed in km. The outcome in columns [4] to [6] is a categorical variable equal to 1 if the student is enrolled into a university located in the same commuting area as their residency at age 16. The outcome in columns [7] to [9] is a categorical variable equal to 1 if the university in which the student is enrolled at age 18 is in area with house prices above the national median. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 17: UNIVERSITY QUALITY

| | University ranking | | | Enrol into a top 10 university | | | Enrol into a top 20 university | | |
|----------------------------|----------------------|----------------------|----------------------|--------------------------------|----------------------|----------------------|--------------------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] |
| 2012 HE Reform | 0.052*** [0.007] | 0.048*** [0.007] | 0.036*** [0.007] | 0.008*** [0.002] | 0.016*** [0.002] | 0.014*** [0.002] | 0.067*** [0.003] | 0.069*** [0.003] | 0.066*** [0.003] |
| 2012 HE Reform * Medium WI | | 0.004 [0.006] | 0.020*** [0.005] | | -0.011*** [0.002] | -0.008*** [0.002] | | -0.001 [0.002] | 0.003 [0.002] |
| 2012 HE Reform * Low WI | | 0.014* [0.008] | 0.046*** [0.007] | | -0.020*** [0.002] | -0.016*** [0.002] | | -0.010*** [0.002] | -0.001 [0.002] |
| Medium WI | -0.088*** [0.003] | -0.089*** [0.004] | -0.041*** [0.003] | -0.012*** [0.001] | -0.009*** [0.001] | -0.002* [0.001] | -0.024*** [0.001] | -0.024*** [0.001] | -0.011*** [0.001] |
| Low WI | -0.172*** [0.005] | -0.177*** [0.005] | -0.063*** [0.004] | -0.023*** [0.001] | -0.016*** [0.001] | 0.001 [0.001] | -0.044*** [0.001] | -0.040*** [0.002] | -0.010*** [0.002] |
| Trend | -0.010 [0.010] | -0.010 [0.010] | -0.026*** [0.009] | [0.003] | -0.013*** [0.003] | -0.016*** [0.003] | -0.045*** [0.004] | 0.135*** [0.004] | 0.138*** [0.003] |
| Trend Squared | 0.000 [0.001] | 0.000 [0.001] | 0.003*** [0.001] | [0.000] | 0.001*** [0.000] | 0.001*** [0.000] | -0.002*** [0.000] | -0.022*** [0.001] | -0.022*** [0.001] |
| Ln [Cohort Size] | 0.191 [0.135] | 0.190 [0.135] | 0.295** [0.129] | [0.037] | -0.225*** [0.037] | -0.209*** [0.037] | -1.800*** [0.056] | -2.133*** [0.054] | -2.079*** [0.051] |
| Constant | -2.492 [1.804] | -2.476 [1.804] | -4.391** [1.719] | 3.136*** [0.489] | 3.115*** [0.489] | 2.829*** [0.487] | 24.426*** [0.746] | 24.414*** [0.746] | 23.935*** [0.731] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | No | Yes | No | No | Yes | No | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 724,072 | 724,072 | 722,830 | 724,072 | 724,072 | 722,830 | 724,072 | 724,072 | 722,830 |
| R-squared | 0.005 | 0.005 | 0.221 | 0.004 | 0.005 | 0.071 | 0.011 | 0.011 | 0.120 |

Notes: The regressions refer to the 2012 reform and include data on 1st year UG students enrolled between 2008/09-2013/14. The outcome in the first three columns is the normalized ranking of the university defined using the Guardian League Table. The outcome in columns [4] to [6] is the probability to enroll into a top 10 university, while the outcome in columns [7] to [9] is the probability to enroll into a top 20 university. The region FEs are defined using the geographical residency of the student at age 16. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

TABLE 18: PROBABILITY TO PURSUE A FIELD OF STUDY

| | Medicine | | STEM | | Social Science | | Languages | | Arts and Education | |
|--------------------------|----------------------|----------------------|----------------------|-------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] |
| 2012 HE Reform | 0.001 [0.003] | 0.001 [0.003] | 0.007 [0.003] | 0.000 [0.003] | -0.006** [0.003] | -0.005* [0.003] | 0.006*** [0.002] | 0.004 [0.002] | -0.000 [0.002] | 0.008 [0.002] |
| 2012 HE Reform * Med. WI | | -0.004 [0.002] | | 0.002 [0.002] | | -0.002 [0.003] | | 0.005*** [0.002] | | -0.001 [0.002] |
| 2012 HE Reform * Low WI | | -0.003 [0.003] | | -0.002 [0.003] | | 0.001 [0.003] | | 0.007*** [0.002] | | -0.003 [0.002] |
| Medium WI | 0.003** [0.001] | 0.006*** [0.002] | -0.007*** [0.002] | -0.001 [0.001] | -0.001 [0.001] | -0.007*** [0.002] | -0.003*** [0.001] | -0.001 [0.001] | 0.009*** [0.001] | 0.002 [0.001] |
| Low WI | 0.005*** [0.002] | 0.011*** [0.002] | -0.012*** [0.002] | 0.002 [0.002] | -0.006*** [0.002] | -0.006** [0.002] | -0.012*** [0.001] | -0.004*** [0.001] | 0.012*** [0.001] | -0.003** [0.001] |
| Trend | -0.007** [0.004] | -0.007** [0.004] | -0.005 [0.003] | -0.004 [0.003] | -0.016*** [0.004] | -0.016*** [0.004] | 0.005* [0.003] | 0.002 [0.003] | 0.024*** [0.003] | 0.025*** [0.003] |
| Trend Squared | 0.001*** [0.003] | 0.001*** [0.000] | 0.001 [0.000] | 0.000 [0.000] | 0.001*** [0.000] | 0.001*** [0.000] | -0.000* [0.000] | -0.000 [0.000] | -0.002*** [0.000] | -0.002*** [0.000] |
| Ln [Cohort Size] | 0.187*** [0.053] | 0.172*** [0.053] | 0.068 [0.047] | 0.013 [0.047] | 0.015 [0.060] | 0.030 [0.060] | -0.047 [0.041] | 0.012 [0.042] | -0.225*** [0.044] | -0.226*** [0.044] |
| Constant | -2.133*** [0.701] | -2.137*** [0.701] | -0.549 [0.632] | 0.110 [0.629] | 0.234 [0.801] | 0.110 [0.797] | 0.620 [0.544] | -0.185 [0.556] | 3.008*** [0.584] | 3.103*** [0.575] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Education Controls | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Region FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| School FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 753,675 | 752,382 | 753,675 | 752,382 | 753,675 | 752,382 | 753,675 | 752,382 | 753,675 | 752,382 |
| R-squared | 0.012 | 0.016 | 0.079 | 0.133 | 0.005 | 0.017 | 0.012 | 0.061 | 0.011 | 0.050 |

Notes: The regressions refer to the 2012 reform and include data on 1st year UG students enrolled between 2008/09- 2012/13. In columns [1] and [2] the outcome variable is the probability to pursue a degree in Medicine; in columns [3] and [4] the outcome variable is the probability to pursue a degree in STEM; in columns [5] and [6] the outcome variable is the probability to pursue a degree in Social Science; in columns [7] and [8] the outcome variable is the probability to pursue a degree in Languages; in columns [9] and [10] the outcomes is the probability to pursue a degree in Arts and Education. The region FEs are defined using the geographical residency of the student at age 16. The outcome is a categorical variable equal to 1 if the student is pursuing a specific field of study 0 otherwise. The school FEs are defined as the school attended by the student at age 16, when they sat the GCSEs * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. Robust standard errors in squared parentheses.

Appendix A

Undergraduate Degree Definition

The undergraduate students who represent the student population considered in this analysis are formed of two categories of students: first degree and other undergraduate degree. According to HESA, the First degree includes first degrees with or without eligibility to register to practice with a Health or Social Care or Veterinary statutory regulatory body, first degrees with qualified teacher status (QTS)/registration with the General Teaching Council (GTC), enhanced first degrees, first degrees obtained concurrently with a diploma and intercalated first degrees. Other undergraduate includes qualification aims below degree level such as Foundation Degrees, diplomas in HE with eligibility to register to practice with a Health or Social Care regulatory body, Higher National Diploma (HND), Higher National Certificate (HNC), Diploma of Higher Education (DipHE), Certificate of Higher Education (CertHE), foundation courses at HE 115 level, NVQ/SVQ levels 4 and 5, post-degree diplomas and certificates at undergraduate level, professional qualifications at undergraduate level, other undergraduate diplomas and certificates including post registration health and social care courses, other formal HE qualifications of less than degree standard, institutional undergraduate credit and no formal undergraduate qualifications. The coding also accounts for the mapping between the old and the new codes which was introduced in 2007/08.¹⁷

¹⁷ Source: HESA undergraduate degree mapping. Website <https://www.hesa.ac.uk/data-and-analysis/performance-indicators/definitions#level-study-applicable-all-tables>

Appendix B

Field of Study

In the HESA data there are 20 major field of study pursued at higher education level, but we group the fields of study in 5 groups as below in order to increase precision:

TABLE B: CODING OF FIELD OF STUDY

| JACS 20 Groups | 5 Subject Groups |
|-------------------------------------|---|
| Medicine and Dentistry | Medicine, Dentistry and Allied Subjects |
| Other Medical Subjects | Medicine, Dentistry and Allied Subjects |
| Biological Sciences | Medicine, Dentistry and Allied Subjects |
| Veterinary Sciences and Agriculture | Medicine, Dentistry and Allied Subjects |
| Physical Sciences | Medicine, Dentistry and Allied Subjects |
| Maths and Computer Sciences | STEM |
| Engineering | STEM |
| Technology | STEM |
| Architecture, Building and Planning | STEM |
| Social Sciences | Social Sciences |
| Law | Social Sciences |
| Business and Administration | Social Sciences |
| Mass Communication & Documentation | Languages and History |
| Linguistics and Classics | Languages and History |
| European Languages | Languages and History |
| Modern Languages | Languages and History |
| History | Languages and History |
| Creative Arts and Design | Education, Arts and Other |
| Education | Education, Arts and Other |
| Combined | Education, Arts and Other |

Appendix C

GCSE Grades

For the period under analysis, the grading system of the GCSEs changed. Based on the information provided by Ofsted and Ofqual, the following scales were used in the calculation of the grades obtained in the GCSE in English and in Maths:

TABLE C: GRADING SYSTEMS GCSEs

| Panel A: Single Awards | | | | | | | | | | | | | | | |
|-------------------------------|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|
| Grade | A* | A | B | C | D | E | F | G | | | | | | | |
| Old points(before 2004) | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | | | | | | | |
| New points(2004 onwards) | 58 | 52 | 46 | 40 | 34 | 28 | 22 | 16 | | | | | | | |

| Panel B: Double Awards | | | | | | | | | | | | | | | |
|-------------------------------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Grade | A*A | A* | A | A | B | B | C | C | D | D | E | E | F | F | G |
| | * | A | A | B | B | C | C | D | D | E | E | F | F | G | G |
| New points (2008 onwards) | 58 | 55 | 52 | 49 | 46 | 43 | 40 | 37 | 34 | 31 | 28 | 25 | 22 | 19 | 16 |

Notes: Double Award GCSE subjects are certificated on a fifteen-point scale for the first time in the June 2008 examination. For the Double Awards, the grade is recorded twice on the certificate to indicate that the results in these specifications have the same status as GCSE grades in two other single-certificate subjects. Source Ofsted and Ofqual, available online at: register.ofqual.gov.uk/Qualification/PerformanceMeasures?qualificationNumber=100_2257_0; www.wjec.co.uk/gcse-explanation-of-results-summer-2014.pdf; [www.jcq.org.uk/exams-office/results-and-certification/grading-of-double-award-gcse-subjects-april-2008-despatch+](http://www.jcq.org.uk/exams-office/results-and-certification/grading-of-double-award-gcse-subjects-april-2008-despatch)