Tuition Fees rises in the UK: Effect on degree choices

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Abstract

There is an ongoing debate about the 2012 higher education reform. Since September 2012, students could pay up to £9,000 a year in tuition fees. Several papers in the literature have attempted to study the effects of these changes on different aspects such as participation rates, financial constraints and how different subgroups of the student population are affected. None of them have studied the impact of the reform on subject choice at an individual level. In this study, student data from HESA are employed to estimate a Multinomial Logit Model with a Diference-in-Differences approach choosing Scotland, where the 2012 reform had no effect, as the control group. Several models are presented depending on students' socioeconomic status and gender. The results show that overall, after the 2012 reform students are less likely to study Arts & Humanities and more likely to choose Health & Life Sciences.

Keywords: Tuition Fees, Subject Choice, Higher Education

1. Introduction

Education and training have become more attractive in the last decade because of the competitiveness increase in the labour market to find a job and reach better labour conditions. In order to increase the likelihood to obtain a better job, once completing high school individuals demand higher education to become more prepared for future careers. After finishing compulsory education and when starting to pursue higher education, they have to choose a subject of interest. This choice will influence several future aspects of the labour career such as wage or job position.

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Since 1998, the way tertiary education in England has been funded implied that, to cover the costs of teaching, students pay tuition fees and the government provides universities with teaching grants. Students are entitled to fee and maintenance loans to be able to pay the main expenses when they attend university (tuition fees plus living expenses). Those students whose families are on a low-income scheme have the right to apply for extra economic help from the government or fee waivers from the universities. In 2012, the government introduced changes that affected how the system was functioning. The teaching grants provided by the government to universities were greatly reduced. In order not to transfer that cost to the universities, the government allowed them to charge higher tuition fees. Higher education reforms regarding increases in tuition fees have been criticised by the media for being the drivers of a shifting in the system: students now behave as consumers purchasing a qualification and not engaging in the acquisition of knowledge and new skills. The last higher education reform did not affect all the countries in the UK. Scotland for example, abolished the £2,000 endowment that students had to pay after graduation and since 2007 students domiciled in Scotland are eligible for free higher education. This context provides us with two countries, England and Scotland, with the latter not being affected by the 2012 tuition fees cap increase.

The research questions investigated in this paper are the following: does the 2012 increase in tuition fees cap have an impact upon students' subject choice? What is the size of this effect? How does this effect change depending on the different students' socioeconomic status? These questions addressed have important policy implications. The possible answers to those questions are linked to the skill composition of the labour force. If the 2012 higher education reform discouraged people from studying a particular subject, this could lead to a potential shortage of labour supply in some areas and an increasing concentration of graduate jobs taken by individuals from the preferred subjects.

In this paper a multinomial logit model is estimated for the subject choice among students domiciled in England and Scotland using data from the Higher Education Statistics Agency (HESA). Average treatment effects under a difference-in-differences approach are used to study the impact of the higher education reform on subject choice. A robustness check is performed using weights obtained by entropy balancing in the regressions.

Sá (2014) addresses the same research question which is related to effect of the 2012 higher education reform on course choice. However there are key methodology and data differences with the present paper. While Sá (2014) uses a linear model and analyses aggregated data, this paper uses individual

student micro data and compares the effect across students from different socioeconomic status. Thus this paper presents the novelty of combining the difference-in-difference estimation approach with a non-linear model for the subject choice at an individual level.

Main findings of this research basically coincide with those from Sá (2014). The results suggest that, after the 2012 increase in the tuition fees cap, subjects associated with lower salaries are less chosen by English students. In other words, the 2012 higher education reform devalued the appeal for subjects with poor career prospects.

This paper is divided as follows: section 2 gives an overview of the policy background regarding the higher education system in England and Scotland; section 3 reviews the relevant literature regarding subject choice; section 4 explains the data set used for the analysis and the variables included in the model; section 5 describes the methodology employed in the estimation; section 6 reports the results obtained; and section 7 concludes the paper.

2. Policy Background and Education Systems

There is an ongoing debate concerning the 2012 Higher Education reform regarding the increase in tuition fees cap. The first form of tuition fees was introduced in all of the United Kingdom in 1998. Since then, in England, the level of university tuition fees has not been constant over time. The tuition fees cap increased to £9,000 in September 2012. More than half of the universities made public their plan to charge the whole amount while the intention of the rest was to charge the minimum amount of £6,000. A brief list of the major changes that this reform entails includes: rise of the deferred tuition fees cap from £3,375 to £9,000 per year; a change in the income threshold where students start to pay back their loans from £15,795 to £21,000; a change in the number of years after which the loans are written off from 25 to 30 years; an increase in the maintenance grant from £2,984 to £3,250 per year if parental income is less or equal to £25,000; and an introduction of the National Scholarship Program to help students from low-income backgrounds to enter Higher Education. According to HEFCE, students starting their full-time course on or after the 1st of September 2012 could be charged an upper tier of £9,000 and a minimum amount of £6,000. In comparison with privately-funded or alternative providers, only publicly-funded institutions are affected by the tuition fees caps. Table 2.1. in Crawford and Jin (2014) summarises the Higher Education funding system in England for students

first enrolled in 2011-12 and 2012-13.

This reform has not been uniform in all the countries of the United Kingdom. Nowadays, Scotland provides free higher education for "ordinary residents" i.e. students domiciled in Scotland for at least three years prior to the starting of the first academic year.

Scotland behaves differently from England in terms of the cost of Higher Education. With the Scottish Graduate endowment scheme in 2001 tuition fees were abolished. In this situation, the money collected from the endowment that graduates paid after their studies was devoted to provide poorer students with bursaries. This mentioned graduate endowment was annulled for those students who graduated on 1st April 2007 or after.

A brief summary of the tuition fees costs depending on country of domicile before starting their course and depending where they choose to study is given. As mentioned before, students domiciled and residing in Scotland who study at a Scottish University do not pay any university tuition fees. Students from Scotland that choose to study at an English University are subject to pay a variable tuition fee up to £3,375 if they started in 2011 and up to £9,000 if the started after 2011. These students can either apply for loans conditional on the income of the household or apply for the Students Outside Scotland bursary. In the academic year 2013/14 there were two available bursaries: the Young Students' Bursary, for students who are under 25 years old with a maximum bursary of £1,750 and the Independent Students' Bursary, for students aged 25 or older with a maximum bursary of £750. All of these bursaries are for students studying elsewhere in the UK or the Republic of Ireland. Students domiciled in England but studying in Scotland followed the same maintenance grant scheme and loan scheme to pay the tuition fees as those studying in England. Repayable loan conditions differ across countries and across academic years.

Turning now to the education systems in England and Scotland, differences will be highlighted. Machin et al. (2013) summarise the main differences between the education systems: Scotland's curriculum is non-statutory; the most common qualifications needed to access university are different with Standard Grades and Highers in Scotland compared to GCSEs and A-Levels in England; in Scotland, local authorities are more influential in school management.

In summary, pupils are allowed to leave school during S4, the final year of Scottish Standard Grades

while in England, year 11 is compulsory for them before leaving after finishing two years of GCSEs. Scottish pupil are allowed to quit school at age 17 after one year of post-compulsory education.

3. Literature Review

Regarding to the literature about the impact of higher tuition fees, Crawford and Jin (2014) published an article focusing on several points related to the 2012 higher education reform. They pay particular attention to the consequences of the debt that students have after finishing their studies. The old debt system was compared to the current system and the authors found that higher earners are more affected.

Related to participation in higher education, Dearden et al. (2011) used the Labour Force Survey to create a pseudo-panel with cohorts varying from 1992-2007 to conclude that a £1,000 increase in tuition fees led a participation reduction of 3.9 percentage points. On the other hand, a £1,000 in maintenance grants increased participation by 2.6 percentage points.

Turning to the literature about subject choice, in a study conducted by Lindley and McIntosh (2014) wage inequality is linked to subject of degree. Wage differentials were calculated by subject from 1994 to 2011. The study gives a potential explanation to the increase of wage inequality over the last decades: less occupational concentration of subjects and widening of cognitive skills of graduates.

Although it could be thought that at the time of choosing their subject of study, future students are uncertain about their potential income, and that this fact would not influence their subject choice, Chevalier (2011), in contrast, maintains that a difference in the amount of tuition fees to be paid and potential future income do have an impact on student choices. An author that agrees with Chevalier (2011) in this idea is Sá (2014). One of her findings was that applications to courses with uncertain employment perspective are more likely to be affected by tuition fees changes. Her article compared two higher education reforms: the 2001 tuition fees reform in Scotland and the 2012 reform in England. The effect of fees on the demand for higher education, university attendance and course choice was examined between these two countries. Regarding the subject choice, Sá (2014) ordered the subjects by employment prospects quartiles and by expected salaries quartiles. In relation to Chevalier's (2011) ideas about the subject specific tuition fees, Sá (2014) suggested that students would be well-

disposed to pay higher fees to attend particular universities or to study particular subjects that offer better employment opportunities.

Regarding linking college major and tuition fees, Walker and Zhu (2011) study the effect of an increase in tuition fees in the internal rate of returns in terms of the quality of the investment in higher education. The analysis gives information across different subjects. Evidence from their paper indicates that the large rise in tuition fees will not generate a significant substitution across subjects. Estimates of college premium are provided as well as graphs that show earning profiles by degree major for men and women.

Up to know several studies explored the relationship between subject choice and other factors. For example, Purcell et al. (2008) draw attention to the influence of socio-economic and educational factors on the subject of degree decision. A survey that they carry on about subject decision-making reveal that interest in the course and employment prospects were the most common reasons why to study an specific subject. They show that age, socioeconomic background, ethnicity and gender have an effect on subject choice. Other studies that agrees with this is Leppel et al. (2001).

There are authors such as Berger (1988) and Beffy, Fougere, and Maurel (2012) that try to establish a relationship between subject choice and future earnings. The first author shows that expected initial earnings have less impact on graduates in comparison with their expected flow of future earnings. Beffy, Fougere, and Maurel (2012) using data from France obtain the effect of expected earnings on the likelihood of choosing a particular subject. They correctly argue that gender and parental profession are related to the choice of major.

4. Data Set and Variables

Data used in this analysis was provided by HESA. This agency is in charge of collecting yearly student data from publicly funded Universities in the United Kingdom[1]. Pooled cross-sections of two academic courses, 2010/11 and 2013/14, were used in this paper. 2011/12 was the academic year just before the tuition fees reform took place while 2013/14 was the year after the tuition fees increase

[1] Nearly all Universities in the United Kingdom are publicly funded.

took place. Students from the 2011/12 academic year were not used to avoid reflecting anticipation effects.

According to the Higher Education Statistics Agency, and looking at the seven year trend graph (Figure 1), we can see that there is a drop in the participation in all subjects before the reform and then a recovery in raw numbers after the reform. Data from HESA show that 521,990 students started first degree courses at UK HE providers in 2013/14. This is 5% higher than in 2012/13, but still 5% lower than in 2011/12 - the last year before the £9,000 fee cap was introduced. If the academic year 2010/11 is compared to 2013/14, groups of subjects such as Social Sciences, Health and Life Sciences and Pure Sciences experienced an increase in participation rates of 2, 10 and 2 percent respectively while Arts & Humanities participation rates comparing these two academic years have decreased by 7 and 4 percent. Subjects such as Medicine or Biological Science, both Health and Life Science subjects, experienced the highest percentage growth in applicants over all the period represented. It can be seen that Engineering & Architecture and Pure Science, over this 7 years period, and comparing the year before and the year after the reform, are the most stable regarding the number of entrants. This graph represents individuals of all ages pursuing their first degree in their first year of study.

Students with the following characteristics are included in the sample: full-time, first degree students, domiciled in the United Kingdom (England/Scotland), who study in an institution in England/Scotland[2], who study a pure subject (students pursuing a combined subject degree are excluded) and who are younger than 21 (to use the parental occupation instead of their own as a proxy of their social status). A list of variables is given:

Outcome Variable:

- Subject Choice (Y_i): takes the value of 0 if Arts & Humanities, 1 if Social Sciences, 2 if Pure Sciences, 3 if Life Sciences and Health, 4 if Engineering & Architecture. This variable is the result of a grouping of subjects using the two digits Joint Academic Coding System (JACS)[3].

Control Variables:

[2] If students who chose to study in other countries such as Wales or Northern Ireland are included, the overall results remain.
[3] The detailed list of all the subjects grouped in each category will be given upon request.

- Male dummy: takes the value of 0 if the individual is a female student, 1 if male student.

- Parental Occupation: takes the value of 0 if Unemployed, 1 if Managers & Professionals (Senior Officials, Associate Professional and Technical occupations), 2 if Intermediate Level occupations (Administrative, Secretarial and Skilled trades occupations), 3 if Elementary occupations (Sales, Customer and Personal service occupations and Process, plant and machine operatives).

  Three dummies are created for the models where the base category corresponds to the Managers & Professionals group. Individuals who have retired parents[4] have been dropped from the sample because the category of the variable could be misleading when interpreting the results since the previous occupation of the parents is unknown. This variable indicates the occupation of the parent, step-parent or guardian who earns the most and it is a recode of the major groups of the Standard Occupational Classification (SOC2000).

- Ethnicity dummies: each corresponding dummy takes either the value of 1 if Asian, Black or Other Ethnicity including mixture where the reference category is White.

- Parental Highest Education dummy: takes the value of 1 if at least one of the student's parents have higher education qualifications, 0 otherwise[5].

- Associated Tariff Points (ATP): Score that indicates two aspects. The first aspect is the types of qualification gained and the second is the grade in that particular gained qualification. For each student, this variable is a sum of all the tariff points that they have obtained in total. This is the closest proxy for ability that is available in the data.

- Treatment Variable (D): takes the value of 1 if the individual is domiciled in England, 0 if domiciled in Scotland. Those from Scotland who decided to study in England are considered not treated because they have the option of not paying for higher education if they stay in Scotland and therefore no higher education cap in tuition fees is imposed to them.

- Time Variable (T): takes the value of 0 if the student belongs to the 'Pre-Treatment' period and starts their undergraduate studies in the academic year of 2010/11. The variable takes the value of 1 if the students belongs to the 'Post-Treatment' period or to the academic year of 2013/14.

[4] The total number of students whose parents are retired represent 0.36% of the full sample.

[5] Missing Values Note: Students provide the Universities with information. Missing data could take the form of not stated information, not known or information refusal. The values from the variables Parental Occupation, Parental Highest Education and Ethnicity could be missing because these are non compulsory fields of the survey.

- Interaction ($T \times D$): takes the value of 1 if the student is domiciled in England and starts to pursue their first degree in the 'Post-Treatment' period.

Students by Country Domicile and Country of Study in the Post-Treatment period

		Country of Domicile		
		England	Scotland	Total
Country of Study	England	201,292	884	202,176
	Scotland	2,822	17,033	19,855
	Total	204,114	17,917	

The table above shows the number of treated and not treated students from HESA database. They belong to the Post-Treatment period ($T = 1$) and they are domiciled in England ($D = 1$) no matter what country of study they select to pursue their undergraduate studies. Recall that students domiciled in England who choose a Scottish higher education provider are subject to a maximum fee level for a degree course of £9,000 as well. Therefore these 204,114 students, are the treated ones in the model presented in the Methodology section[6]. Additionally, the previous table shows evidence of low student mobility between these two countries.

After cleaning the data and imposing all the restrictions mentioned before, Table 1 shows that the sample comprises 395,015 students domiciled in England and 34,701 domiciled in Scotland; slightly under 52% of those domiciled in England started their studies after the reform in the academic year 2013/14. The corresponding percentage for those domiciled in Scotland is similar.

Table 1 presents descriptive statistics, distinguishing between students domiciled in England and those domiciled in Scotland, and pre/post reform within these groups. On the whole, students domiciled in England are similar to students domiciled in Scotland. In particular, regarding the subject choice variable, Table 1 columns (1) and (2) show that, taking into account both academic years, for some subjects such as Arts and Social Sciences, the percentage of students is larger for students domiciled in England than those domiciled in Scotland. The opposite occurs with subjects such as Pure Science, Health and Engineering; these subjects are relatively more popular among students domiciled in Scotland. However, if all the subjects are taken into account, apart from those who chose to study Arts, the percentage of students between domiciled in England and domicile in Scotland do not differ by more than 6%. Even though differences in characteristics exist between the two groups of students, it can be

[6] Results remain the same when students domiciled in Scotland who chose an English Higher Education provider are excluded from the analysis.

seen that these differences only occur in some of the control variables. For instance, it is unsurprising that the percentage of university students aged 17 and under is higher for those domiciled in Scotland than for those domiciled in England. This difference stems from the fact that in Scotland, they can progress to University after college at the age of 17 or spend only one more year in college after age 16 before taking their Highers (the Scottish University access exams) while in England the most common age to start University is 18. Regarding the older age groups, there are fewer older students (aged 20) domiciled in England than in Scotland while the opposite happens for students aged 19. With respect to the ATP (the proxy for ability), students domiciled in England have, on average, a higher total score. This means that either they have attained more qualifications than students domiciled in Scotland or those qualifications have been attained with a better grade. Notice that the ATP score increases the more qualifications the student has or the better the grade is in each of these qualifications. On the other hand, parents of students domiciled in Scotland are more likely to have attained higher education in comparison with parents of students domiciled in England. Regarding ethnicity, whites are more predominant amongst Scottish domiciled students and the contrary occurs for Asians and Black students. In general, with respect to ethnicity, there is more diversity amongst the students domiciled in England. Scotland has a lower proportion of ethnic minorities and is relatively poorer compared to England (ONS, 2002).

It is widely known that nowadays, there are more girls than boys pursuing higher education. This phenomenon is observed in all the subsamples irrespective to the period of study or the region of domicile. Although parental occupations distribution is not even within country of domicile, parental occupation proportions are similar across students from both countries of domicile with slight differences in some of the occupational groups. These summary statistics suggest that, on the whole, there are few differences in the composition of students domiciled in Scotland and England.

Migration Flows Between Countries in the UK

According to Simpson and de Sheridan (2014) the overall number of applications and acceptances to the UK higher education institutions have decreased since 2012. These authors, basing their analysis on student acceptances, argue that the 2012 Higher Education reform had a different impact on applicants depending on the country where they live before starting their course. In particular, as Higher Education is free for Scottish domiciled students if they study in Scotland, it is natural to think that the 2012 Higher Education reform that took place in England could act as a financial incentive to pursue

their degree in a Scottish Institution rather than an English one. However, further evidence from a different dataset is next presented regarding stable mobility trends in the United Kingdom over time.

Using actual data of students from the Education Information Database for Institutions[7] (HEIDI) and plotting students from all levels of study, full time, first degree and domiciled in England and Scotland, Figure 2 shows that the time trends on the number of students studying in different countries from they were domiciled are stable over time. More precisely, there is a slightly larger number of Scottish students who stay in their country of domicile to study their degrees in the year of the reform (90%) compared to the year before (89%). The contrary occurs for English domiciled students who stay in their country of domicile to pursue their degrees in the year of the reform (95%) compared to the year before (96%). To summarise, the bar chart in Figure 2 shows that the student flows between administrations do not greatly vary over time.

Mosca and Wright (2010) analysed migration flows for undergraduate students. Cohorts of graduates are used between 2002/03 and 2006/07. Using data from HESA, these authors demonstrate that the majority of graduates chose to study their degrees at their home country.

To conclude, Heat maps made by HESA are shown in Figures 3 and 4 and they reveal that in the 2013/14 academic year, students tend to stay and pursue their first degree in their country of domicile. These figures represent full-time first degree students by region of higher institution provider and region of domicile. According to HESA, in the academic year of 2013/14, 95% of students domiciled in England and Scotland remained there to pursue their first degrees. This again shows evidence of little student mobility across countries.

Financial consideration is a key element for school-leavers when they decide whether to obtain higher education and where to pursue their degree. There is no doubt that student migration across countries in the United Kingdom was present before and after the increase in the tuition fees cap in 2012, albeit in small numbers. However, Figure 3 reveals that migration flows between England and Scotland have not changed drastically over time. This happens despite the 2012 reform and the fact that the Scottish group are eligible for free higher education. It could still be thought that the the 2012 reform has had

[7] HEIDI: web-based management information service run by HESA. HEIDI provides a rich source of aggregated information about higher education statistics in the UK. HEIDI provides aggregated statistics for students with certain characteristics such as region of domicile.

an effect on the control group (students domiciled in Scotland), but the figures shown give evidence that the migration flows between administrations do not reflect this.

5. Methodology

Puebla and Velasco (2006) pointed out that when a student finishes college and decides to pursue a higher education degree, she has to select one out of several alternative subjects. It is assumed that students choose the subject that maximises their utility. In broad terms, following Greene (2011), the reason why an individual i chooses to study subject j is because, out of all the the alternatives (other possible subjects), subject j represents the maximum utility, U_{ij}. According to this author, the econometric model is driven by the probability that choice j is made, and can be expressed as:

$$\text{Prob}(U_{ij} > U_{ik}) \quad \text{for all other} \quad k \neq j \tag{1}$$

The utility function takes the form of

$$U_{ij} = \theta_j X + \alpha T + \beta D + \gamma TD + \epsilon \tag{2}$$

Y_i, the outcome variable, is defined as a random variable that indicates the chosen subject j. The student has a multiple choice among: 0=Arts & Humanities, 1=Social Science, 2=Pure Science, 3=Life Science and Health and 4=Engineering & Architecture. X is the vector containing control variables including parental and individual characteristics such as parental highest education, ethnicity, ATP and other independent variables. As mentioned in the Data and Variables section, T and D, are time and group indicators respectively. The Multinomial Logit Model (MNL) is used to estimate the probability of studying a particular subject:

$$P(Y_i = j) = F(\alpha T + \beta D + \gamma TD + \theta X) = \frac{exp(\theta_j X + \alpha T + \beta D + \gamma TD)}{1 + \sum_{k=1}^{J} exp(\theta_k X + \alpha T + \beta D + \gamma TD)} \tag{3}$$
$$\text{where} \quad j = 0, 1...J$$

Difference-in-differences in the MNLM

Why the control group is required lies with the fact that we cannot observe the outcome for the same individual if they were not exposed to the tuition fees increase or in this context, what subject would have been chosen if the tuition fees increase had not occurred. Because at a given point in time the same individual could not have two simultaneous existences, a good counter-factual is needed for those students who are affected by the 2012 tuition fees increase reform. The fact that the Higher Education reform has not affected in the same way different UK countries helps us to find a good control group: students domiciled in Scotland who study in an institution based in Scotland are not affected by the 2012 tuition fees cap increase. In fact, the Scottish domiciled students are eligible for free higher education and are not required to pay university tuition fees.

The reason why Scottish students are likely to be a satisfactory control group is that they share common characteristics with the English students, except for the alleged treatment. The main difference between these two groups of students is where their higher education institution is located. Therefore, the treatment group will be defined as those students who are domiciled in England while the non-treated group will be students whose region of domicile is Scotland.

In order to evaluate the impact of the higher education reform in 2012, the difference-in-differences approach is used in conjunction with the subject choice model. This evaluation method has a main advantage: temporal effects in the subject choice can be taken into account. An assumption of the model is that any unobserved heterogeneity between students that is time invariant is controlled for. Puhani (2012) shows how to calculate the difference-in-differences estimator for a nonlinear model. This authors only considers binary models. Extending that methodology to the MNLM allows us to calculate the average treatment effect on the treated (ATET). Depending on the treatment, there are two potential outcomes, $Y_i^{(1)}$ and $Y_i^{(0)}$. The first potential outcome $Y_i^{(1)}$, the outcome of interest, denotes the outcome if the student receives treatment, while the second potential outcome, $Y_i^{(0)}$, indicates that no treatment was received. Following Puhani (2012), the difference in the potential outcomes of the dependent variable is:

$$\tau(T_i = 1, D_i = 1, X_i) = E[Y_i^{(1)}|T = 1, D = 1, X] - E[Y_i^{(0)}|T = 1, D = 1, X]. \tag{4}$$

As we can see in equation (4) the treatment effect is obtained by the difference in two expectations.

Equation (5) indicates the participation in the treatment (I)

$$I = 1[T = 1, D = 1] = T \times D \tag{5}$$

where $1[\cdot]$ is the indicator function taking the value of 1 if the expression in brackets is true and 0 otherwise. I will be equal to 1 if the student is domiciled in England and starts their undergraduate degree in the academic year 2013/14. Assuming common trends in U_{ij} It can be shown that the conditional expectations of the potential outcomes $Y_i^{(0)}$ and $Y_i^{(1)}$ respectively are

$$E[Y_i^{(0)}|T, D, X] = F(\alpha T + \beta D + \theta X) \tag{6}$$

which is the counterfactual and

$$E[Y_i^{(1)}|T, D, X] = F(\alpha T + \beta D + \gamma + \theta X). \tag{7}$$

Substituting equations (7) and (6) in (4) gives the treatment effect in the 'difference-in-differences' multinomial logit model,

$$\tau(T_i = 1, D_i = 1, X_i) = F(\alpha + \beta + \gamma + \theta X) - F(\alpha + \beta + \theta X). \tag{8}$$

In order to calculate the ATET for a particular subject, ATET_{P_j}, we need to average the treatment effect obtained in equation (8) over the treated sample which gives

$$\text{ATET}_{P_j} = \frac{1}{N^1} \sum_{i=1}^{N} TD\{F(\alpha + \beta + \gamma + \theta X) - F(\alpha + \beta + \theta X)\} \tag{9}$$

where $N^1 = \sum_{i=1}^{N} TD$.[8]

Regarding the statistical significance of the estimate of the ATET, the delta method or bootstrapping must be applied in order to obtain correct standard errors.

Robustness test using weights.

[8] Lechner (2011) proposes an alternative method to calculate the ATET_{P_j} using an indicator of the observed outcome rather than the predicted probabilities for the first term in equation (8). Due to the property of the multinomial distribution specified in equation 15.8 in Cameron and Trivedi (2005), the approach proposed by Lechner (2011) will give the same coefficient to that followed by Puhani (2012) to calculate ATET_{P_j}.

In order to test the ATETs obtained for the general model, entropy balancing will be performed. Hainmueller and Xu (2013) describe the way to implement this multivariant re-weighting method to obtain a balanced sample. One of the insights of the method is that decreases model dependency for the analysis of treatment effects and enables to obtain weights that satisfy a set of balance constraints. For this analysis, as the majority of covariates are binary variables we only need to balance on the first moment of the covariates distributions in the treatment and control group. Once the weights are created, the means of the covariates are very similar (balanced) among the control group and the treated group. The particular advantage of this method to obtain the weights is that, based on the covariates chosen, control units who have more similar units in the treated group will be given a higher weight. After obtaining the weights following this procedure, we run the MNL model but this time adding as sampling weights the weights obtained following Hainmueller and Xu (2013). The covariates chosen to match the moments are explained in the results section. If the ATETs coefficients are similar, this can increase confidence in the results obtained.

6. Results

The use of the difference-in-difference methodology requires common pre-treatment trends in the treated and control groups. The methodology section contains detailed information regarding these groups. Aggregated data from HEIDI are used to check the subject choice time trends in England (the treated group) and Scotland (the control group) in Figure 5. The population analysed are students with the following characteristics: full time education, first degree, first year and from the United Kingdom. The main subject categories include the following groups:

- Arts & Humanities: Creative Arts, Design, Historical and Philosophical Studies and Languages.
- Social Science & Law: Business and Administration, Law, Mass Communication, Documentation, Sociological Studies and Education.
- Pure Science: Computer Science, Mathematical Science and Physical Science.
- Life Science & Health: Agriculture and Related, Biological Science, Medicine, Dentistry, Subjects allied to Medical Studies and Veterinary Science.
- Engineering & Architecture: Building, Planing, Engineering and Technology.

Figure 5 illustrates the percentage of students studying a particular subject out of the total number of students in each country. It can be seen that, for both countries, Arts & Humanities subjects have become less popular over time showing a shift in young people's decisions. Before the outburst of the economic crisis, when job prospects were not limited, young people who were uncertain about what they really wanted to study would choose Arts & Humanities. However, nowadays, young people face a different situation. Having a degree in science or maths, for example, may allow them to access a wide range of jobs in the future. In many cases employers are seeking candidates with a strong mathematical background because of the skills acquired during education even if the position is not a mathematically based one. Figure 5 shows the percentage of students enrolled in Social Science & Law and Engineering & Architecture in 2009/10 and reveals the same pattern: a decrease in the number of people studying those subjects. The reverse occurs in the graphs corresponding to Pure Science and Life Science & Health.

On the whole and over the years represented in the figure, trends for Arts & Humanities, Social Science & Law and Pure Sciences are flatter and, more importantly, have negative rather than positive slopes than Life Sciences & Health and Engineering & Architecture. Regarding the steepness of the curves it can be seen that they do not differ significantly between countries. For Arts & Humanities and Life Sciences & Health the steepness is similar while more pronounced steepness can be found for Scotland in Pure Science and Engineering & Architecture, represented by a dotted line in comparison with the solid line for England. Therefore there were more drastic changes in the number of students choosing those particular subjects in Scotland over the period. For the vast majority of the analysed years, the percentage of students doing Arts & Humanities and Social Science & Law is lower in Scotland than in England while the contrary is true for Pure Science, Life Science & Health and Engineering & Architecture. We should emphasise that before the higher education reform represented by the vertical solid line and before the first cross-section used in the analysis represented by the vertical dashed line, there is presence of common trends and in particular, the graph regarding Health & Life Sciences and Arts & Humanities shows that students after the reform in England are more likely to choose Health & Life Sciences and are less likely to choose Arts & Humanities. We will see that this argument is supported as well by the ATETs coefficients besides the evidence shown in Figure 5. Overall, Figure 5 shows that the trends do not dramatically differ between countries before the first year of data used.

Table 2 presents the average treatment effects on the treated for the different subjects. These effects, obtained using equation (8), give the average difference in outcomes between the actual and counterfactual outcome for the treated group and indicate the impact of the higher education reform on the subject choice among English domiciled students. Rows 1-5 show the results for the possible outcomes in the multinomial model.

Due to the nature of the model, any of the ATET using the difference-in-differences approach in this particular framework could be interpreted as follows: for example, for the first coefficient, the negative ATET for Arts & Humanities shows that the impact of the higher education reform was a decrease in the probability of studying Arts & Humanities among English students. After the increase in the tuition fees cap, English domiciled students are less likely to study Arts & Humanities and Social Science while they are more likely to study Health & Life Science. This could be explained by the fact that students wish to ensure that the high tuition fees payment will lead to high expected future earnings and better employment prospects as Sá (2014) argues. According to HESA, out of all UK domiciled full-time university graduates who obtained first degree qualifications and entered full-time paid work in the UK in 2013/14, those who studied a degree in Medicine and Dentistry, Veterinary or Engineering earn, on average, the highest annual first salary[9]. On the other hand, students who hold a degree in Arts and Design receive the lowest salary after graduation. This could explain why the signs of the coefficients are generally negative and significant for the ATET in Arts & Humanities and positive for Health & Life Sciences; again, students consider expected future earnings and employment prospects when choosing a degree subject.

Regarding the sign of the coefficients for the other subjects and focusing now on socioeconomic status, there is a less clear pattern: coefficients change sign depending on the different parental occupations. Turning now to the ATET for all the subjects and all the students, it is clear that out of all the statistically significant coefficients, the ones from the unemployed parents have the largest size, implying that the higher education reform in 2012 had a larger effect on the probability of choosing a particular degree for students with unemployed parents than students with parents holding an occupation. However, only the Health & Life Sciences ATET coefficient from students with unemployed parents is statistically significant.

[9] Averages obtained from HESA Destinations of Leavers from Higher Education survey.

Although there seems to be a pattern for the ATET signs for all the students, there are differences between boys and girls' choices. In the present paper, gender differences are more striking in Pure Science and Engineering than in the remaining subjects. Although the coefficients are not statistically significant, a negative coefficient pattern arises for girls when estimating the ATET on Engineering and Architecture. After the reform, girls are less likely to study these subjects. Purcell et al. (2008) show gender differences when choosing a subject of degree. Related to future employment, women demonstrate short term career planning while men are more intrinsically-oriented and generally concentrated on employment opportunities when choosing a subject. As a consequence, female presence in engineering degrees is often poor[10]. A possible explanation for a different reaction to a fees cap increase could be related with gendered debt aversion. Davies and Lea (1995) state that men were more likely to be in debt than women. If the tuition fees increase in England, students face a higher debt to pay after graduation. Due to this larger debt aversion of women, girls could be more affected by the reform than boys. Moreover, girls might not be willing to choose longer educational trajectories such as Engineering or Architecture (which require extra period to be chartered) that will somehow accumulate more debt over time.

Going back to the statistical analysis and turning the attention to students with unemployed parents, although the majority of the ATETs are not statistically significant, there are no differences in the signs for the coefficients between girls and boys; therefore, the higher education reform impacted on the probability of studying a particular subject in the same direction for both genders among those with unemployed parents. This can be seen if columns 10 and 15 are compared.

In absolute terms, and not taking into account the socioeconomic status (column 11), the size of the treatment effect is larger for girls choosing Health & Life Science than for the other subjects. Specifically, girls affected by the reform are less likely to study Arts & Humanities relative to what they would have done in the absence of the reform, with the effect being significant at the 1 percent level. Regarding Health & Life Science, the effect is larger and statistically more significant for female students.

[10] Some campaigns such as WISE have been developed in the UK to mitigate gender differences regarding participation in Engineering and to encourage girls to pursue a career in technical subjects.

On the other hand, when splitting the sample according to parental occupation, it can be seen that Managers and Professionals' daughters are around 3 percentage points less likely to study Arts & Humanities and around 1 percentage points less likely to study Engineering while the sons are around 2 percentage points less likely to pursue a career in Pure Science after the reform.

It might be the case that sons or daughters of parents in intermediate occupations behave according to the Human Capital Theory and proceed one step further than their parents pursuing higher education. Therefore they are more likely to study a degree that will ensure a higher paid job such as those in Health & Life Science. This argument is related to the negative and less statistically significant ATET coefficients for those students choosing a degree in Social Science, a heterogeneous subject group including pursuers of degrees that offer very attractive job prospects such as Economics and Law or less attractive like Mass Communication and Documentation[11].

There is no clear and straightforward explanation for the coefficients that refer to students with parents in elementary occupations, probably because this is a very heterogeneous group. Column 4 shows that these students are 1.5 percentage points more likely to study a degree in Engineering & Architecture.

To conclude, it is worth mentioning that, after the reform, students with unemployed parents are around 8 percentage points more likely to choose a degree in Health & Life Science; in particular, boys are 10 percentage points more likely to choose a subject of this kind, as respectively columns 5 and 10 from Table 2 show. Probably these students coming from disadvantage backgrounds may not be well informed about higher education choices and career prospects.

Table 3 shows the robustness test for the subject choice models. The covariates chosen to balance the sample are gender, parental occupation, ATP, ethnicity and parental highest education. Age is not used because depending on the country of domicile and due to differences in the education system in England and Scotland, this variable increases the variability of the whole the sample rather than homogeneise it. While other variables are very similar in the two countries of domicile, the age distribution is a bit different across countries. After balancing the sample and the allocation of weights to the control and treated units the results (Table 3) are very similar to the initial ones (column 1 in

[11] According to the DLHE survey out of all the social science subjects, Mass Communications & Documentation has the lowest mean salary for UK domiciled full-time leavers who obtained first degree qualifications and entered full-time paid work in the UK in 2013/14.

Table 2). According to the weighted regression English domiciled students after the reform are less likely to study a degree in Arts & Humanities and more likely to study Health & Life Sciences.

Marginal effects of the control variables from the MNLM are shown in Table 4. These coefficients represent the marginal effect that each of the control variables have on the probability of choosing a specific subject of study. The way they differ from the ATET is that these marginal effects are obtained for all the student population, not only for the treated. Also, the ATET in this particular study only refers to the Marginal Effect of the $D \times T$ interaction term. As a general comment, it can be seen that the majority of coefficients are statistically significant, therefore the chosen control variables are relevant for the subject choice. ATP is used as a proxy for ability and high ability students tend to be less likely to choose a degree in Arts & Humanities or Social Science and are more likely to choose Health & Life Sciences, Engineering & Architecture or Pure Sciences. Having at least one parent or both having attained higher education affects the probability of their sons/daughters choosing a particular subject except for girls that choose Pure Sciences or Health & Life Sciences. This impact is positive and significant for all subjects except for those who study Pure Science. Given that the main scope of this paper is to evaluate the effect of the 2012 higher education reform on subject choice no more attention is drawn to the average marginal effect coefficients.

7. Conclusions

This paper exploits the 2012 increase in tuition fees in higher education cap to estimate its causal effect on English domiciled students' subject choice. A multinomial logistic regression is used to model the subject choice and two cross-sections are employed for the statistical analysis —one in 2010/11 before the reform occurred to avoid any interference from anticipation effects, and other in 2013/14 after the reform occurred. As Scotland was not affected by this higher education reform, it was used as a counterfactual case for the difference-in-differences methodology.

Main results of this study show that, after the 2012 increase in the tuition fees cap, English domiciled students —no matter their socioeconomic status— are 2 percentage points less likely to study a degree in Arts & Humanities and around 3 percentage points more likely to study a degree in Health & Life Sciences. This evidence strongly suggests that after the higher education reform students take into account employment prospects when deciding the subject of study. In particular, English students

with unemployed parents have experienced the largest impact of education reform in terms of ATET's size in comparison with students whose parents hold an occupation.

From a methodology point of view, this paper extends the work presented by Puhani (2012) in the context of non-linear models and combines a multinomial logistic model with a difference-in-differences approach in order to evaluate the impact of the latest higher education reform on subject choice among English students. Controls for sex, parental occupation, ethnicity, parental education, as well as students ability (derived from their associated tariff points) are included in the model. Even though available data did not allow to formally test for common time trends by means of dummy variables for different years, and despite the limited number of variables included in the model, the results obtained seem to be solid. The trends are graphically tested using aggregated data from HEIDI and they do not seem to differ one from another.

Several papers have dealt with different dimensions regarding the impact of the 2012 higher education reform in England, but the present study throws new light on its possible effects on subject choice. If the Government decides to continue increasing the tuition fees cap in future years, it might consider this effects apart from the ones already studied in the literature such as those related to widening participation. A concentration of students in certain subjects favored by the reform could arise and, therefore, affect the potential labour force supply in England.

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Tables and Figures

Figure 1: First Year, First Degree students by Subject of Study (HESA)

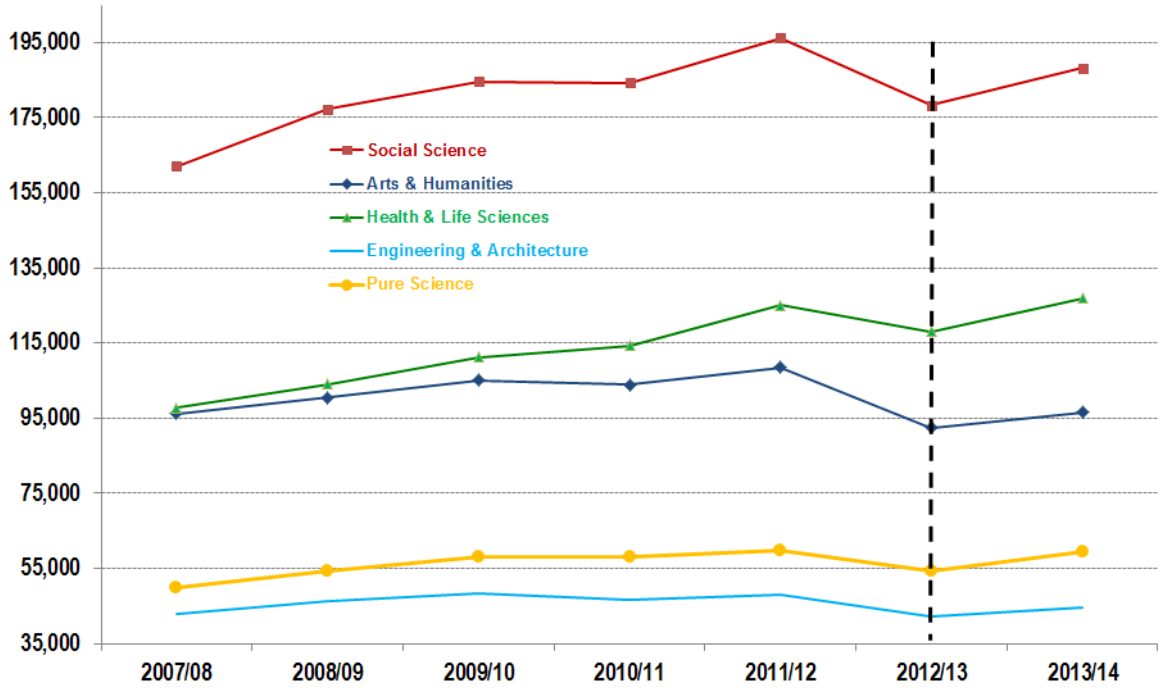

Figure 2: Students Migration Flows Between Administrations Over Time

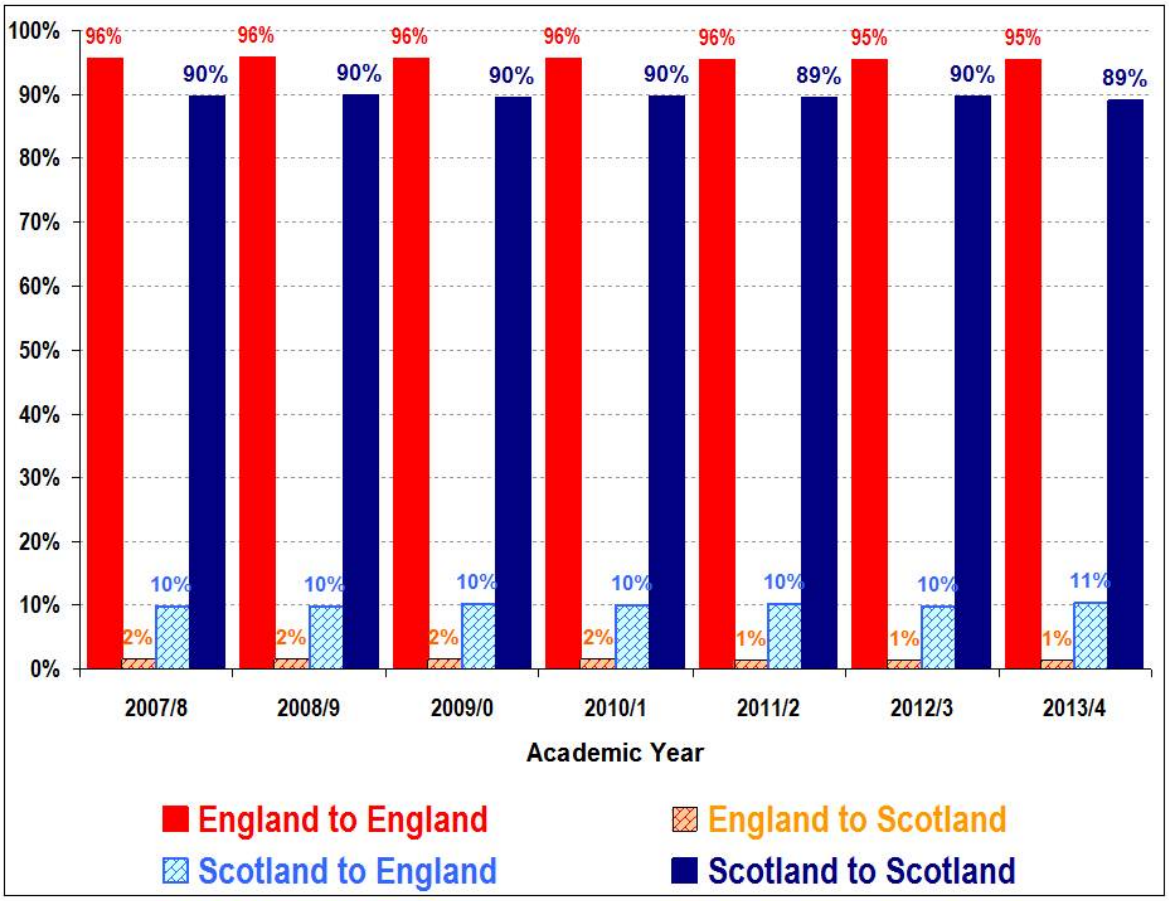

Figure 3: Students Domiciled in England by Region of HE provider 2013/14

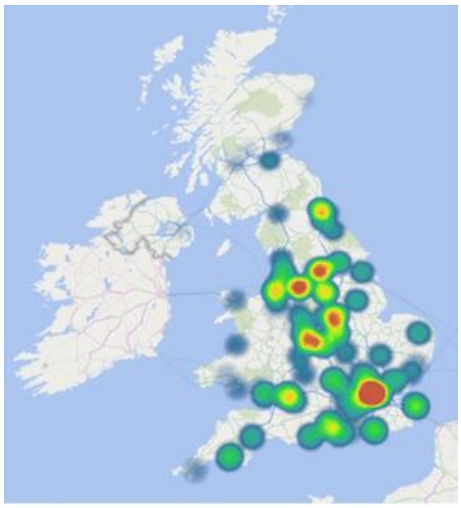

Figure 4: Students Domiciled in Scotland by Region of HE provider 2013/14

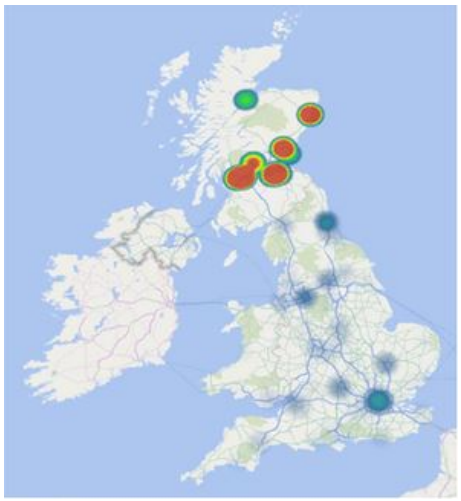

Figure 5: Percentage of Students by Subjects and Country of Study

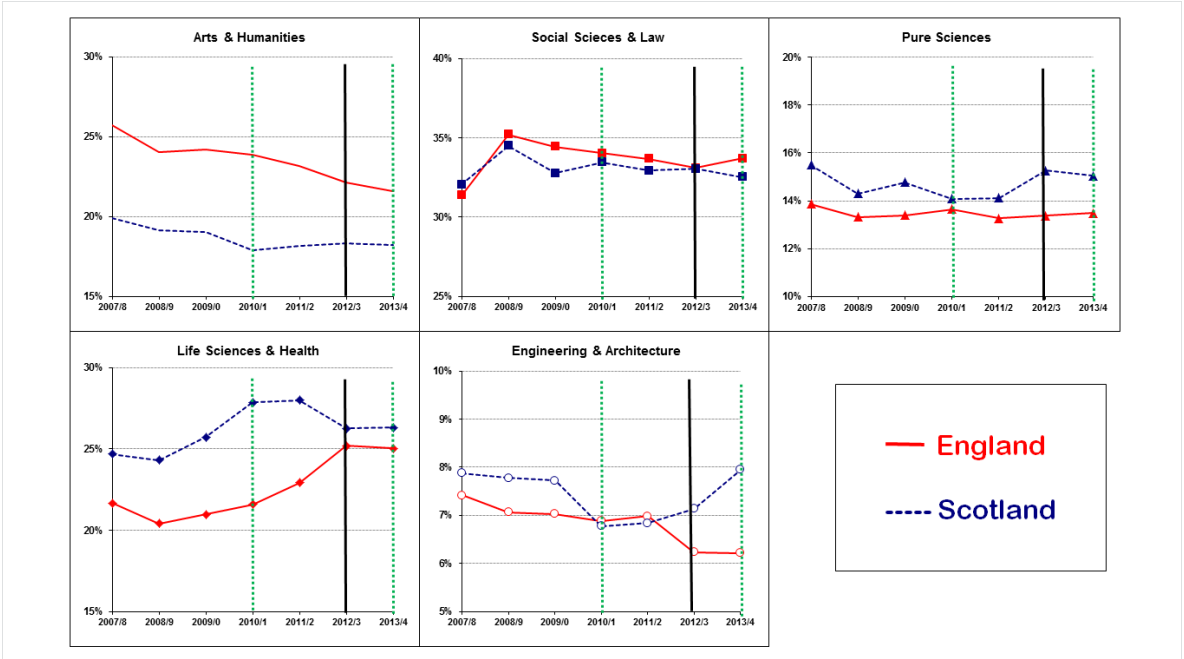

Table 1: Characteristics of English Domiciled and Scottish Domiciled

	Domiciled England	Domiciled Scotland	Domiciled England		Domiciled Scotland	
			Pre-Reform 2010/11	Post-Reform 2013/14	Pre-Reform 2010/11	Post-Reform 2013/14
	(1)	(2)	(3)	(4)	(5)	(6)
Subject						
Arts & Humanities	0.234	0.124	0.243	0.226	0.124	0.125
Std. Dev.	0.424	0.330	0.429	0.418	0.329	0.331
Social Science	0.314	0.299	0.317	0.311	0.299	0.299
Std. Dev.	0.464	0.458	0.465	0.463	0.458	0.458
Pure Science	0.130	0.144	0.129	0.131	0.141	0.147
Std. Dev.	0.336	0.351	0.335	0.338	0.348	0.354
Health & Life Science	0.238	0.296	0.225	0.250	0.299	0.293
Std. Dev.	0.426	0.456	0.418	0.433	0.458	0.455
Engineering & Architecture	0.083	0.137	0.085	0.081	0.137	0.137
Std. Dev.	0.276	0.344	0.279	0.273	0.344	0.343
Male	0.464	0.439	0.470	0.458	0.440	0.438
Std. Dev.	0.499	0.496	0.499	0.498	0.496	0.496
Age Dummies						
17, 16 & Under	0.002	0.288	0.003	0.002	0.292	0.284
Std. Dev.	0.049	0.453	0.053	0.044	0.455	0.451
18 (base)	0.601	0.455	0.594	0.608	0.462	0.448
Std. Dev.	0.489	0.497	0.491	0.488	0.498	0.497
19	0.299	0.156	0.303	0.294	0.154	0.158
Std. Dev.	0.458	0.363	0.460	0.456	0.361	0.365
20	0.097	0.101	0.099	0.095	0.091	0.110
Std. Dev.	0.296	0.301	0.299	0.294	0.288	0.313
Associated Tariff Points	453.083	435.949	430.817	472.907	415.907	454.640
Std. Dev.	200.911	208.015	202.049	197.795	207.486	206.770
Ethnicity						
White (base)	0.755	0.933	0.771	0.739	0.941	0.925
Std. Dev.	0.429	0.249	0.419	0.438	0.234	0.263
Asian	0.131	0.041	0.125	0.136	0.038	0.045
Std. Dev.	0.337	0.199	0.330	0.343	0.190	0.208
Black	0.061	0.006	0.055	0.066	0.006	0.007
Std. Dev.	0.239	0.079	0.228	0.249	0.076	0.082
Other (including Mixed)	0.053	0.019	0.049	0.057	0.015	0.023
Std. Dev.	0.224	0.136	0.215	0.232	0.121	0.149
Parental Higher Education	0.536	0.653	0.549	0.525	0.658	0.649
Std. Dev.	0.499	0.476	0.498	0.499	0.474	0.477
Parental Occupations						
Managers & Professionals	0.588	0.635	0.599	0.578	0.636	0.635
Std. Dev.	0.491	0.481	0.489	0.493	0.480	0.481
Intermediate Occ.	0.178	0.176	0.184	0.173	0.182	0.171
Std. Dev.	0.383	0.381	0.387	0.379	0.386	0.376
Elementary Occ.	0.204	0.173	0.190	0.217	0.168	0.177
Std. Dev.	0.403	0.378	0.392	0.412	0.374	0.381
Unemployed	0.029	0.015	0.027	0.032	0.013	0.017
Std. Dev.	0.169	0.122	0.163	0.175	0.113	0.130
Observations	395,015	37,701	190,901	204,114	16,784	17,917

Table 2: Difference-in-Differences

	All Students					Boys					Girls				
	All Occ. (1)	M&P (2)	Interm. (3)	Elem. (4)	Unem. (5)	All Occ. (6)	M&P (7)	Interm. (8)	Elem. (9)	Unem. (10)	All Occ. (11)	M&P (12)	Interm. (13)	Elem. (14)	Unem. (15)
$ATET_{S_1}$: Arts & Humanities	-0.019 ***	-0.015 *	-0.024	-0.028	-0.089	-0.005	-1.02×10^{-4}	-0.007	-0.014	-0.128	-0.029 ***	-0.027 **	-0.033	-0.034	-0.054
	(0.007)	(0.009)	(0.019)	(0.018)	(0.075)	(0.010)	(0.012)	(0.028)	(0.025)	(0.142)	(0.010)	(0.012)	(0.025)	(0.025)	(0.089)
$ATET_{S_2}$: Social Sciences	-0.008	-0.005	-0.029 *	-0.001	0.029	-0.012	-0.010	-0.045 *	0.018	0.021	-0.005	-0.003	-0.018	-0.006	0.024
	(0.006)	(0.007)	(0.016)	(0.016)	(0.065)	(0.010)	(0.012)	(0.027)	(0.025)	(0.109)	(0.008)	(0.010)	(0.021)	(0.022)	(0.085)
$ATET_{S_3}$: Pure Sciences	-0.004	-0.008	0.012	-0.002	-0.037	-0.010	-0.019 *	0.037 **	-0.022	-0.033	4.67×10^{-4}	0.001	-0.004	0.005	-0.025
	(0.004)	(0.005)	(0.009)	(0.010)	(0.053)	(0.008)	(0.010)	(0.018)	(0.023)	(0.104)	(0.004)	(0.005)	(0.010)	(0.008)	(0.054)
$ATET_{S_4}$: Health & Life Sciences	0.028 ***	0.029 ***	0.037 ***	0.016	0.082 **	0.012 *	0.020 **	0.002	-0.021	0.105 ***	0.041 ***	0.038 ***	0.059 ***	0.036 **	0.050
	(0.005)	(0.006)	(0.012)	(0.013)	(0.037)	(0.007)	(0.008)	(0.021)	(0.024)	(0.033)	(0.007)	(0.009)	(0.016)	(0.018)	(0.062)
$ATET_{S_5}$: Engineering & Architecture	0.003	4.48×10^{-4}	0.003	0.015 ***	0.014	0.0154 ***	0.009	0.014	0.040 ***	0.035	-0.006 **	-0.009 **	-0.003	-0.001	0.005
	(0.002)	(0.003)	(0.006)	(0.005)	(0.020)	(0.005)	(0.007)	(0.014)	(0.011)	(0.045)	(0.002)	(0.003)	(0.005)	(0.004)	(0.012)
Observations	146,762	86,120	25,150	31,020	4,472	65,432	39,571	10,952	12,982	1,927	81,330	46,549	14,198	18,038	2,545

Notes: A MNLM is used to estimate the predicted probabilities based on treated and control individuals. These probabilities are employed to calculate the $ATET_{P_j}$ using equation (8) for the treated sample. The delta method is used to obtain the standard errors. The significance levels are $^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$. There are three different specifications of the model. Control variables in all the models are age, ethnicity, parental education dummies, atp, T, D and the interaction term TD. Column 1 contains gender and occupation variables as well. Apart from the control variables included in all models, columns 6 and 11 contain parental occupation dummies. The models in columns 2-5 control for gender and parental occupation.

Table 3: ATET using a weighted MNLM

	All	
ATET$_{S_1}$: Arts & Humanities	-0.023	***
	(0.008)	
ATET$_{S_2}$: Social Sciences	0.001	
	(0.008)	
ATET$_{S_3}$: Pure Sciences	-0.005	
	(0.005)	
ATET$_{S_4}$: Health & Life Sciences	0.024	***
	(0.006)	
ATET$_{S_5}$: Engineering & Architecture	0.003	
	(0.003)	
N	146,762	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Average Marginal Effects from the Multinomial Logit models

	Arts & Humanities			Social Sciences			Pure Sciences			Health & Life Sciences			Engineering & Architecture		
	All (1)	Boys (2)	Girls (3)	All (4)	Boys (5)	Girls (6)	All (7)	Boys (8)	Girls (9)	All (10)	Boys (11)	Girls (12)	All (13)	Boys (14)	Girls (15)
Male	-0.085***			-0.062***			0.135***			-0.115***			0.127***		
	(0.001)			(0.002)			(0.001)			(0.002)			(0.001)		
Unemployed	-0.014**	-0.005	-0.020***	0.013**	-0.007	0.029***	0.021***	0.047***	-2.36×10^{-4}	-0.013***	-0.018***	-0.008	-0.008**	-0.017***	-0.001
	(0.005)	(0.008)	(0.007)	(0.005)	(0.008)	(0.007)	(0.004)	(0.008)	(0.004)	(0.005)	(0.007)	(0.007)	(0.003)	(0.006)	(0.003)
Intermediate Occ.	-0.009***	-0.010***	-0.009***	-0.012***	-0.021***	-0.005	0.011***	0.019***	0.004**	0.006**	0.003	0.008**	0.005***	0.009***	0.002
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)
Elementary Occ.	-0.016***	-0.016***	-0.015***	-0.008***	-0.022***	2.19×10^{-4}	0.017***	0.035***	0.003	0.010***	0.007**	0.013***	-0.003**	-0.005*	-0.001
	(0.002)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)
17, 16 & Under Years Old	-0.022***	-0.031***	-0.015*	-0.013**	-0.025**	-0.006	0.022***	0.034***	0.016***	-0.005	-0.007	-0.005	0.017***	0.029***	0.010***
	(0.006)	(0.008)	(0.009)	(0.006)	(0.010)	(0.009)	(0.005)	(0.009)	(0.005)	(0.005)	(0.008)	(0.008)	(0.003)	(0.007)	(0.003)
19 Years Old	0.067***	0.047***	0.084***	-0.030***	-0.002	-0.054***	-0.029***	-0.041***	-0.019***	-0.004**	0.005*	-0.011***	-0.004***	-0.009***	1.55×10^{-4}
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.001)
20 Years Old	0.041***	0.049***	0.034***	-0.040***	-0.027***	-0.050***	-0.013***	-0.014***	-0.015***	0.013***	-0.002	0.029***	-0.001	-0.006	0.003
	(0.003)	(0.004)	(0.005)	(0.003)	(0.005)	(0.005)	(0.003)	(0.005)	(0.003)	(0.003)	(0.004)	(0.005)	(0.002)	(0.004)	(0.002)
Associated Tariff Points	-4.63×10^{-5}***	-7.77×10^{-5}***	-1.70×10^{-5}***	-2.35×10^{-4}***	-1.40×10^{-4}***	-3.23×10^{-4}***	1.29×10^{-4}***	1.39×10^{-4}***	1.24×10^{-4}***	1.09×10^{-4}***	3.43×10^{-5}***	1.77×10^{-4}***	4.23×10^{-5}***	4.45×10^{-5}***	3.94×10^{-4}***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Asian	-0.169***	-0.152***	-0.180***	0.053***	0.058***	0.048***	0.007***	-0.007**	0.019***	0.078***	0.051***	0.098***	0.031***	0.050***	0.016***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)	(0.002)	(0.003)	(0.002)
Black	-0.136***	-0.109***	-0.157***	0.092***	0.081***	0.102***	-0.025***	-0.036***	-0.017***	0.031***	0.010**	0.049***	0.037***	0.054***	0.023***
	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.006)	(0.003)	(0.005)	(0.003)
Other Ethnicity	-0.035***	-0.039***	-0.032***	0.023***	0.023***	0.022***	-0.016***	-0.024***	-0.009***	0.008**	0.018***	-2.07×10^{-4}	0.021***	0.022***	0.019***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.006)	(0.006)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.003)	(0.005)	(0.002)
Parental High Educ.	0.033***	0.020***	0.043***	-0.045***	-0.032***	-0.056***	-0.002	-0.006**	0.001	-0.004**	-0.007***	-0.001	0.018***	0.025***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.001)
Ac. Year 2013/14 (T)	0.011*	0.002	0.017*	0.007	0.006	0.009	0.003	0.017**	-0.007*	-0.015***	-0.007	-0.021***	-0.007**	-0.018***	0.002
	(0.007)	(0.010)	(0.009)	(0.006)	(0.009)	(0.008)	(0.004)	(0.008)	(0.004)	(0.005)	(0.008)	(0.007)	(0.003)	(0.006)	(0.002)
Treatment (D)	0.126***	0.098***	0.148***	0.016***	0.042***	-0.002	-0.002	-0.006	0.001	-0.082***	-0.016**	-0.136***	-0.058***	-0.117***	-0.012***
	(0.003)	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.004)	(0.007)	(0.004)	(0.005)	(0.007)	(0.007)	(0.004)	(0.007)	(0.003)
Interaction ($T \times D$)	-0.019***	-0.005	-0.028***	-0.009	-0.013	-0.007	-0.005	-0.011	1.59×10^{-4}	0.029***	0.013	0.042***	0.004	0.017***	-0.006***
	(0.007)	(0.010)	(0.009)	(0.006)	(0.010)	(0.008)	(0.004)	(0.008)	(0.004)	(0.006)	(0.008)	(0.008)	(0.003)	(0.006)	(0.002)
Observations	289,625	129,570	160,055	289,625	129,570	160,055	289,625	129,570	160,055	289,625	129,570	160,055	289,625	129,570	160,055

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$