Higher Education Financing and the Educational Aspirations of Teenagers and their Parents *

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Abstract

We study the impact of higher education financing on the academic aspirations of teenagers and their parents. We exploit a reform which introduced a large increase in the tuition fees universities can charge, more generous support for the poorest students and a more redistributive student loan system, and varied across the UK's constituent countries. Using rare survey data on post compulsory secondary and university education aspirations, we find that teenagers' aspirations are not responsive to large changes in higher education financing. In contrast, parents adjust their aspirations, resulting in a reduction of the socio-economic aspiration gap for their children.

Keywords: Education aspirations, university cost, access to Higher Education.

JEL codes: I23, I22, I24, J24, D84

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1 Introduction

Around the world governments are grasping with the conflicting objectives of expanding higher education, especially among poorer students, while maintaining educational quality standards and financial sustainability. The debate often centres on the introduction of tuition fees or their elimination, but has recently focused on the affordability of student loans, especially in countries where tuition fees are charged. Two types of loan systems exist in different jurisdictions: mortgage type (U.S.) versus income contingent (Australia, New Zealand, U.K.).[1] The former leaves students with the risk of default if future incomes are lower than expected. The latter, where repayment is conditional on post-graduation income, creates uncertainty about the final cost of the loan. The combination of tuition fee level and loan type availability also affects the equity in access to higher education in complex ways. Evidence for Australia and the UK suggests that a shift from free higher education to charging tuition fees covered by income contingent loans does not have detrimental effects on participation and might even reduce the social enrolment gap (Chapman and Ryan, 2005; Crawford et al., 2016; Murphy et al., 2019).[2]

Yet, individual investment decisions regarding higher education are constrained by choices taken in secondary school (Chowdry et al., 2013). Dalton et al. (2016) argue that aspirations are important drivers of early schooling investments, costly to revise, and might trap individuals out of higher education. Belfield et al. (2020) report that university aspirations are largely shaped by the consumption value that teenagers attach to it. Rizzica (2020) finds that UK policies to widen participation of pupils from disadvantaged backgrounds in Higher Education, rolled out in the early 2000s, substantially increased aspirations in the target group. While these policies focused on outreach activities to provide information and familiarity with Higher Education, we focus on how tuition and higher university financing affect the aspirations of younger children. The literature has focused largely on estimating the contemporaneous elasticity of demand for higher education with respect to its sticker price or to financial support. The contribution of this paper is to inves-

[1] Extensive discussions on the two types of loan and their effects on the income distribution of graduates and public costs are available in Barr et al. (2019) and Britton et al. (2019).

[2] Which financing policy is eventually adopted is ultimately a political decision. Lergetporer and Woessmann (2019) provide experimental evidence on how popular support for tuition fees fluctuates depending on the policy design, in particular the fee amount and how prospective students can finance their education.

tigate how large changes to the sticker price in an income-contingent loan system – which implies heterogeneous post-graduation costs of university–, affects the aspirations of younger children, and of their parents, towards higher education.

England, which over a 20 year period shifted from a policy of no tuition fee and mortgage type loans to charging some of the highest fees in the world combined with universal income contingent loans, provides interesting evidence. Murphy et al. (2019) show that despite the large increase in sticker price, enrolment to higher education kept rising. Contrary to the expectations of some that students from poorer backgrounds are more averse to take on loans (Callender and Jackson, 2005; Callender and Mason, 2017), the socio-economic gap in access did not increase (Azmat and Simion, 2020). This low elasticity of demand for higher education is not well understood but may also be a feature of income contingent loans. Under the current system, loans are written off after a set period of time, and up to 70% of graduates are estimated to never repay their loans fully (Department for Education, 2019). Assuming prospective students have a good understanding of the loan policy, a sticker price increase may thus have a limited effect on the demand for higher education since it increases notional debt but might not affect the expected repayment for most. This effect may be even stronger for women and graduates from lower social background, who have lower average life time earnings (Crawford et al., 2016), and benefit most from the loan write-off.

In particular, we investigate how the 2010 Higher Education Act affected educational aspirations. The Act almost tripled tuition fees and increased the expected debt on graduation from £25,000 to £44,000 (Crawford and Jin, 2014), but also altered the parameters of income contingent loans. The loan system became more progressive by increasing the income threshold for loan repayments, making the bottom 30% of graduates in terms of post-graduation earnings better off under the new system (Chowdry et al., 2012; Crawford and Jin, 2014). Support for poorer students also increased. As such, the reform has heterogeneous effects on the expected costs of higher education depending on family income and on expected post-graduation earnings. Estimates of the contemporaneous effect of this reform on the demand for higher education found a short-run drop in enrolment of 5% to 10% (Azmat and Simion, 2020; Sá, 2019), but no longer-run effects (Murphy et al., 2019), and a reduction in the enrolment gap by social background driven by a

greater reduction in participation from children originating from higher income families (Azmat and Simion, 2020). Instead we focus on the impacts of the financing reform on the educational aspirations of younger cohorts, in particular their intention to attend the most academic secondary track, and to go to university.

The large public debate on tuition fees and extensive street demonstrations that surrounded the reform insure that information regarding the future costs of higher education was widely available, making the reform an ideal experiment on how change in the financing of university might affect the educational aspirations of pupils aged 10 to 15 and of their parents. As in Sá (2019), our identification relies on differences-in differences estimates based on variation in the implementation of the reform between constituent countries of the United Kingdom.[3] Scottish students were unaffected by the Higher Education Act. Welsh students were isolated from the tuition increase through specific tuition grants, and only affected by the change to the support and loan system. Only students in England faced the full reform combining increased tuition fees, altered student loans and support.[4]

We use rarely available information on the aspirations of teenagers and of their parents, contained in six waves of Understanding Society, a large representative UK Household Longitudinal Study, during the 2009 to 2015 period[5]. We focus on the eduction aspirations of teenagers aged 10 to 15, and of their parents who were separately asked about their aspirations for the education of their children. We distinguish aspirations in two domains directly related to higher education investment: i) obtaining higher secondary qualifications that allow for the pursuit of higher education (i.e. A-levels), a choice that is usually made at age 15 to 16 and ii) intentions to study at university. It is important to look at the aspirations of children but also of their parents. Polidano and Buddelmeyer (2013) estimate that the most important factors explaining the gap in school

[3]Higher education legislation is devolved to regional parliaments (not for England) which can directly legislate (Scotland) or alter national policies (Northern Ireland, Wales). We exclude residents of Northern Ireland from this analysis, as they did not pay tuition fees when studying in the Republic of Ireland throughout our study period, making it ambiguous how they were impacted by the reform.

[4]Note that the differences in legislation also affected university funding per student which increased in England but remained at a lower level in Wales and Scotland (Murphy et al., 2019). It is however unclear how such differences in funding would affect educational aspiration of pupils, which were elicited independently of where they expect to study.

[5]Further reforms of the loan system were implemented in 2016.

completion rate are parental aspirations and test scores. Maternal expectations in particular, have been found to strongly influence their daughters' educational choices (Attanasio and Kaufmann, 2014). In the case of the 2010 Higher Education Act, good financial literacy is required to understand the reform, resulting in potential differences in the reform impacts between children and their parents, but also by parental education level. We thus focus on estimating heterogeneous impacts by social background. We also estimate gender-specific impacts, since women tend to benefit more from the write-off policies due to their lower earning profiles over their life-time.

We find that the aspirations of teenagers regarding investing in post-compulsory education and going to university are insensitive to changes in the sticker price of university. Despite significant aspiration differences by gender and family background at baseline and differentiated financial impacts of the 2010 Higher Education Act, we find for all groups that the passing of the legislation had no impact on pupils' educational aspirations. Yet, we do find that their parents reacted to the reform. Richer mothers adjusted their aspirations for their children's education downwards in reaction to the substantial increase in the expected cost of higher education, while poorer mothers' aspirations increased, in line with the expansion of financial support available to their children and the greater insurance against the risk of higher education via the increased repayment threshold. In consequence, the social gap in parental aspirations is reduced. These results suggest that such institutional reforms may have long-run effects on education decisions via their impact on parental aspirations. The finding of a limited overall effect and a moderate reduction in the social aspirations gap is consistent with findings of limited reform impacts on the higher education participation of directly affected cohorts (Azmat and Simion, 2020; Murphy et al., 2019), and findings by Belfield et al. (2020) that financial considerations do not affect teenager's educational aspirations. Additionally our results contribute to the discussion of the relative merits of student loans. Universal income-contingent loan systems may contribute to a reduction in the social gap in parental aspirations.

The strong and persistent socio-economic gap observed in higher education participation across many countries appears to have little to do with financial constraints (Cameron and Heckman, 1998; Keane and Wolpin, 2001; Cameron and Taber, 2004) and indeed the participation elasticity

with respect to financial support is generally modest (see, e.g. Dearden et al. (2014) and Fack and Grenet (2015)). Nor is the gap due to differences in information. Experiments providing information on financial support, costs or returns to higher education have been largely ineffective or even increased the social gap in participation (Oreopoulos and Dunn, 2013; Peter and Zambre, 2017; Booij et al., 2012; Fryer Jr, 2016; Dinkelman and Martínez A, 2014; McGuigan et al., 2016). This could be because by the time information is provided, students academic credentials largely determine their higher education decision. For example, Chowdry et al. (2013) emphasises that the participation gap in HE in the UK is driven to a larger extent by "poor achievement in secondary schools among pupils from low socio-economic backgrounds than [by] barriers arising at the point of entry to HE". A similar gap emerges in the aspirations of parents regarding their children's educational choices, but again it cannot be closed by just providing information on the costs and returns to higher education (Lergetporer et al., 2018). In contrast to the experimental evidence, our results suggest that higher education policies can impact future investment decisions as parents adjust their aspirations in a forward-looking manner.

2 Institutional Setting

In this section, we briefly define the education system in Great Britain and set out the specifics of the 2010 Higher Education Act and the pre-reform financing environment in the constituent countries of Great Britain.

2.1 Secondary school qualifications in GB

Until 2013, pupils chose to enter a higher secondary education academic track, vocational training, apprenticeship programs or leave education at age 16. In 2013, the "participation age" in England was raised to 17 and then to 18 in 2015; it remained 16 in Wales.[6] Pupils in the academic track

[6]The school leaving age has remained at age 16, but until their 18th birthday pupils must remain in school, work or training for at least 1 day a week. Since the increase in participation age might have also affected attitudes towards education, we provide sensitivity analysis by estimating the impact of the 2010 Higher Education Act separately for (i) a binding sample of English teenagers for whom the 2013 and 2015 raise in participation age were binding; and (ii) the non-binding sample. Overall, we find no evidence that the impact of the 2010 higher education act on aspirations of neither pupils nor their mothers is different in these two samples. See Online Appendix B.2 for detailed analyses.

choose three subjects to study for another two years towards Advanced level certificates, so called A-levels, which are the prime qualification to enter higher education. In Scotland, education is fully devolved. At age 15, pupils in the academic track can decide to study for "Scottish highers" which offer a broader choice of subjects than English A-levels. The timing and qualifications differ across UK countries but in all legislations, pupils expecting to go to university must decide around the age of 15/16 to study towards upper secondary education.

2.2 University fees across the UK

In the past 25 years, the financing of higher education in the UK underwent several reforms to shift from no tuition to one of the most expensive higher education systems in the world. In this section we briefly highlight the changes brought about by the 2010 Higher Education Act; a description of higher education financing from the Sixties onwards can be found in Murphy et al. (2019).

In 2011-12, tuition fees in England and Wales were capped at £3,375, subject to annual inflation adjustment (see Table 1 below). Most institutions charged the maximum amount. Tuition fees and maintenance costs could be financed through income-contingent loans, so that higher education was free at the point of entry for all students. The interest rate on student loans was fixed at exactly the inflation rate; i.e. 0% real interest rate. Loan repayment was conditional on graduate annual earnings being above £15,795 with a 9% repayment rate of income above this threshold. After 25 years, any unpaid sums were extinguished. Additionally, low income students were eligible for a non-repayable means-tested grant of up to £2,906 per year, and for universities bursaries to a value of at least 10% of the tuition fees.

In 2007, the Scottish Assembly introduced free higher education in Scotland for Scottish students (Fees are paid on behalf of students by the Student Award Agency for Scotland). Students from other parts of the UK were subject to fees of up to £1,820. Scottish students are eligible for income contingent loans, with some minor differences to the one offered to English and Welsh students, to cover their living costs (see Table 1). Poorer students are eligible for means-tested bursaries.

2.3 Higher education tuition reform

The Browne review on higher education funding, whose findings were published in October 2010, recommended a lifting of the tuition fee cap and an increase of the income threshold at which loans needed to be repaid. Almost immediately, students organised large scale demonstrations which took place in central London on a weekly basis. In the 3rd week of protests, the Welsh assembly announced that it would not increase tuition fees for Welsh students. On December 14, 2010, Westminster parliament adopted most of the recommendations from the Browne review which were implemented for the cohort entering higher education in the academic year 2012/13.

The reform almost tripled the tuition fee cap English universities could charge, to £9,000 per year. Although universities were given discretion over the exact tuition, the average fee rose to £8,040 in 2012/13, and no institution charged less than £6,000 (HEFCE, 2016). In parallel, student financing was altered. The repayment threshold on tuition loan was raised to £21,000, albeit at a higher real interest rate of up to 3% depending on income, and the repayment period was extended to 30 years. The reform also expanded financial help for the poorest students; grants for students from family earning less than £25,000 increased by 9% to £3,250 per year but disappeared for those with a family income between £42,600 and £50,695.[7] A National Scholarship Program was set-up to provide fee waivers of up to £3,000 to the poorest students.

Overall, the average student debt at graduation was predicted to increase from £24,754 to £44,035 (at 2014 prices) (Crawford and Jin, 2014). Average life-time repayment was predicted to increase from 1.1% to 2.1% of life-time earnings on average. However, due to the increase in the repayment threshold, the bottom 3rd of graduates would be better off under the new system (Chowdry et al., 2012). The greater progressivity is largely due to the increased income threshold at which repayments are made and to a smaller extent to the greater support for poorer students (Crawford and Jin, 2014). The reform is thus redistributive along two dimensions: first, students from lower SES families gain access to increased financial support; secondly, students with low post-study earnings realisations make low or no repayments on their student loans. Although the two groups may differ, Crawford et al. (2016) show that the gap between the income of graduates

[7] Maintenance grants were abolished in 2016. This does not affect our analysis since we only consider cohorts up to 2015.

coming from the richest and poorest families is about 31 per cent.

Wales implicitly capped tuition fees at £3,465 by introducing a universal grant for all Welsh students to make up the shortfall up to the £9,000 charged by most universities. This deviation from the English system neutralises the hike in tuition fees for Welsh pupils wherever they study and leaves them only affected by the changes in the support and loan system.[8]

The reform did not affect Scottish students studying at Scottish institutions. The small minority of Scottish students studying in England, Northern Ireland or Wales would be charged up to £9,000 but could apply to the Student Awards Agency for Scotland for a loan. English and Welsh students studying in Scotland were subject to the £9,000 tuition fee post-reform rather than the £1,820 they were previously charged.

Table 1 summarises the changes in tuition costs and funding available to students by country of residence. To summarise, the Higher Education Act 2010 notably increased tuition fees in England but had no effect on tuition fees for Scottish and Welsh residents. Moreover, in England and Wales, student loans become less generous - due to the increased interest rate and repayment period -, but more redistributive over the life time, as the repayment threshold is increased. Grants were also made marginally more generous for the poorest students but targeted a smaller group. The reform clearly defines two treatment groups: England, where fees and financing changed, and Wales where financing changed, and one control group: Scotland.

Information about the reform permeated largely in the population, making it credible that it could affect teenagers' educational aspirations. Between the release of the Browne review of Higher Education on October 12, 2010 and the passing of the Higher Education Act on December 14, 2010, weekly large students demonstrations took place throughout the country. These demonstrations resulted in extensive and sustained media coverage of the new HE financing rules (see also McGuigan et al. (2016)). We confirm the interest in information about the financing of higher education by looking at google search behaviour by country. Figure 1 reports the number of Google search hits for "tuition fees" per week, standardised to 100 at its peak. The day the legislation was passed coincides with the peak of general interest in tuition fees in the three countries. There is no further

[8]The Welsh parliament abolished the fee grant for the 2018/19 academic year.

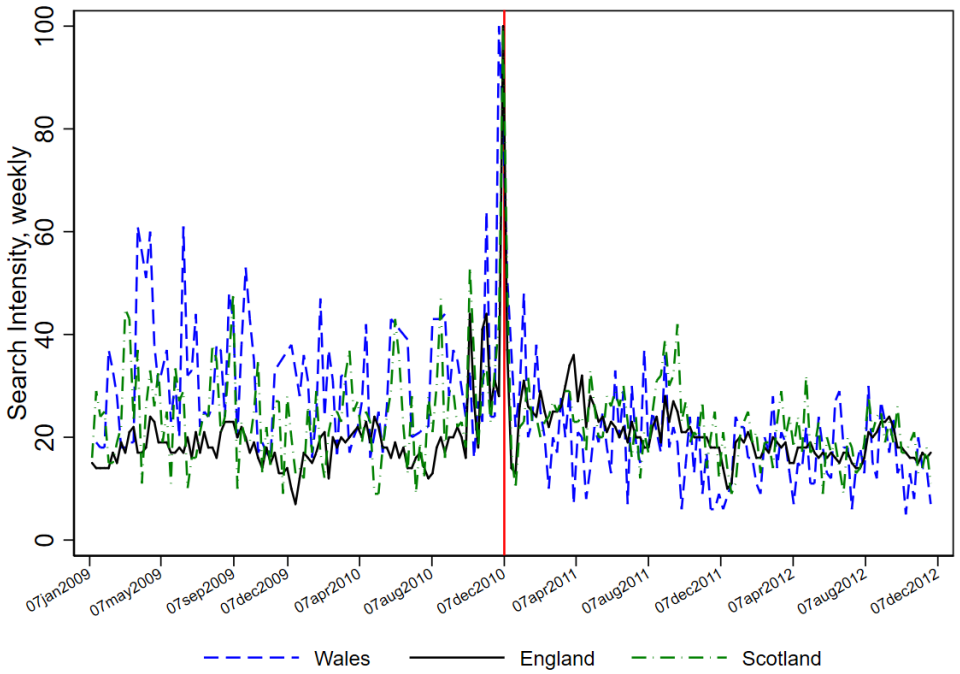
Table 1: Financing of higher education in 2011 and 2012 by country of domicile

	Pre-reform (2011-12)	**Post-reform (2012-13)**
	Tuition fees	
England	£3,375 (£1,820 at Scottish HEI)	Up to £9,000
Wales	£3,375** (£1,820 at Scottish HEI)	Up to £9,000 (Tuition Fee Grant up to £5,535)
Scotland	£3,375 (£0 at Scottish HEI*)	Up to £9,000 (£0 at Scottish HEI)
	Tuition loan	
England	Interest: RPI Income threshold: £15,795 Period: 25 years	Interest: up to RPI + 3% Income threshold: £21,000 Period: 30 years
Wales	Interest: RPI Income threshold: £15,795 Period: 25 years	Interest: up to RPI + 3% Income threshold: £21,000 Period: 30 years
Scotland	Interest: Min of RPI or base rate +1% Income threshold: £15,000 Period: 35 years	Interest: Min of RPI or base rate +1% Income threshold: £15,795 Period: 35 years

* From 2001 to 2007, graduates had to make a one-off payment (endowment) of £2,000 after study completion
** Between 2006/07 and 2009/10 Students domiciled in Wales and studying in Wales were entitled to a tuition fee grant for tuition fees above £1,380.

discontinuity in tuition information in the years following the announcement. In particular, there is no spike in internet search intensity around the actual implementation dates: December 2011 when most students apply for a place or in September 2012, when the first students to be charged under the new regime started university. We thus base the treatment timing on the date of the passing of the Higher Education Act, and use respondents' interview dates to assign pre and post-treatment status.

Figure 1: Public interest in tuition fees in the UK



Data source: Google Trends (www.google.com/trends). The figure shows the search for terms "Tuition" + "Tuitions" + "Tuition Fees" + "Tuition Fee" + "University Fees" in England, Scotland, and Wales. Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. Likewise a score of 0 means the term was less than 1% as popular as the peak.

3 Data

In our analysis, we use panel data from Understanding Society (USoc), a representative sample of over 40,000 UK households, covering the period between 2009 and 2015. We focus on the subsample of families with adolescent children between 10 and 15 years. We make use of a unique feature of the survey: collection of data on education aspirations from teenagers and their parents for several cohorts and for the whole country.[9]

Teenagers' educational aspirations

Teenagers' educational aspirations are elicited through a self-completion youth questionnaire, administered to 10,704 teenagers aged 10 to 15 living in participating households. We capture teenagers' educational aspirations along two key dimensions, i) obtaining qualifications that allow for the pursuit of Higher Education (i.e. A-levels), and ii) intentions to go to university. Since

[9]Subjective expectations about education choices have been elicited in the Longitudinal Survey of Young People in England, but are naturally targeting the LSYPE cohort of individuals born in 1989/90 in England.

Table 2: Definition of key outcome variables

Domain	Survey instrument
Teenagers' aspirations towards own education	
Advanced qualifications (A-levels)	"What would you like to do at age 16?" - get a full-time job - *stay at school or college to do A-levels/Highers* - get an apprenticeship - do some other form of training - do something else - don't know
Study at university	"Would you like to go to University?" - *yes* - no - don't know
Parental aspirations towards teenagers' education	
Advanced qualifications (A-levels)	"How important do you think it is for your child/children to complete [A level]?" - *very important* - important - not very important - not at all important - don't know
Study at university	"Would you personally like to see NAME go on to university or college when they finish their schooling?" - *yes* - no - don't know

Note: Binary aspiration variables are defined as taking the value 1 if the option marked in italics was chosen, and zero otherwise. Source: Understanding Society (waves 1-6, 2009-2015).

university admissions are largely based on A-levels results, attitudes towards obtaining A-levels can affect the probability of applying – and being admitted – to university.

We construct binary indicators of high and low aspirations for each dimension, based on the survey questions listed in Table 2.[10] Teenagers have high advanced educational aspirations if they report to plan to continue school beyond age 16 and wish to take A-level exams.[11] We define university aspirations as high if students express intent to pursue a Higher Education degree.[12] We link teenagers' aspirations from the youth surveys with information on their parents' education, and a wide set of household characteristics such as monthly household net income, and the constituent country and region they live in.

Prior to the reform, adolescents' educational aspirations are high, in line with very similar findings by McGuigan et al. (2016) in a sample of 14 to 15 year olds using different survey instruments

[10]We use data on aspiration from Understanding Society only, as its smaller predecessor, the British Household Panel Survey (BHPS) covers a longer time period, but uses a very different set of aspiration questions.

[11]Due to changes in the answer categories of the A-levels question between the first two and subsequent waves, we categorise teenagers as intending to take A-levels if they plan to continue studying beyond age 16 (either full-time or in conjecture with a job)

[12]Individuals who plan to get a full-time job at age 16 are not asked about their HE aspirations. We classify those with intentions to start work immediately as having low aspirations towards university. We code "Don't know" answers as missing.

Table 3: Teenagers' educational aspirations prior to the tuition reform by maternal education and household income

A. Aspirations by maternal education

	A-levels and above		*Less than A-levels*				*No. of obs*	
	Mean	Std.	Mean	Std.	Difference	p-value	$\geq$ A-levels	$<$ A-levels
A-levels	0.8682	(0.3384)	0.762	(0.426)	0.1061	(0.000)	2966	2648
University	0.8920	(0.3104)	0.7994	(0.401)	0.0926	(0.000)	2779	2418

B. Aspirations by household net income

	Median and Above		*Below Median*				*No. of obs*	
	Mean	Std.	Mean	Std.	Difference	p-value	$\geq$ Median	$<$ Median
A-levels	0.8668	(0.3398)	0.7796	(0.4146)	0.0873	(0.0000)	2546	3484
University	0.8932	(0.3089)	0.8098	(0.3925)	0.0835	(0.0000)	2370	3217

Note: All aspiration variables are based on binary definitions of high and low aspirations where high (low) aspirations are reported as 1 (0). Source: Understanding Society (waves 1-3, pre-reform period).

to elicit aspirations. 82% of teenagers state an intention to pursue A-levels, and 85% of teenagers wish to attend university.[13] This is overly optimistic compared to the higher education initial participation rate for 17 to 20 year olds which ranges between 37% and 41% for the period of study (Department for Education, 2017). In line with previous UK studies (Rampino and Taylor, 2013; Berrington et al., 2016; Hartas, 2016), we find much lower aspirations among males, resulting in an 11 percentage point gender gap in aspirations regarding A-levels (76 versus 87%, $p-value < 0.0001$) and a 10 percentage point gap regarding university aspirations (79 versus 90%, $p-value < 0.0001$). In addition, we find rising aspirations with age, with 10 (8) percentage point higher aspirations regarding A-levels (university) among 13 to 15 year olds.

In Table 3, we report aspiration differences by two measures of socio-economic status - household net income and mothers' education. 76% of teenagers with lower educated mothers want to obtain A-levels which is about 10 percentage points lower than for teenagers with more educated mothers. A similar aspiration gap of about 9 percentage points also exists for aspirations towards obtaining

[13]Lower responses are found in the Longitudinal Survey of Young People in England that collects data for one cohort. In the survey 13 year old students (and their parents) say they have a 65% (60%) probability of going to university. Several reasons may explain these differences: first, the questions in LSYPE aim to elicit subjective probabilities of going to university, i.e. expectations, while Understanding Society focuses on aspirations. Some students may desire to go to the university even though they think they are not likely to be able to do so. Secondly, the LSYPE cohort (born in 1989/90) is about 4-5 years older than the cohorts in our study. Since the early 2000s, the UK rolled out widening participation policies to increase the university participation of pupils from disadvantaged backgrounds. As Rizzica (2020) shows, this resulted in a substantial increase in education aspirations. All cohorts in our sample would have benefitted from these policies, so we would expect them to have higher aspirations.

a university degree (p-value ≤ 0.0001). Similarly, 78% and 81% of teenagers from families with below median income aspire to obtain A-levels respectively a university degree, about 8 percentage points lower than teenagers from higher income families (p-value ≤ 0.0001). Thus, we confirm a substantial socio-economic gap in teenagers' educational aspirations.

Parental aspirations for their children's education

USoc also captures parental aspirations regarding the importance of completing A-levels and whether parents would like to see their children attend university.[14] We construct binary indicators of high and low aspirations (See panel B in Table 2 about how these indicators are constructed). Similar to their children's, parental aspirations are high, regardless of which parent is asked. Yet, we do not find statistically significant aspiration gaps by the age of the child, and slightly higher educational aspirations with respect to daughters' university education (2 ppts, p-value=0.0004), but no difference regarding A-level aspirations.[15] We find no evidence that fathers' and mother' aspirations for their children are different (p-value=0.4327 for university and p-value=0.2074 for A-levels aspirations). Thus, we focus on mothers aspirations because absent fathers would reduce our sample size by almost a half and thus create selection bias.[16] Three-quarters of mothers think that it is very important that their children complete A-levels. Higher educated parents have higher aspirations towards their children's education. Yet the socio-economic gap in parental aspirations amounts to 7 and 1 percentage points respectively regarding A-levels and university aspirations and is statistically significant, but much smaller in magnitude than among their children (See Table 4). We find little difference in aspirations by household net income.

[14]These aspirations are elicited every two years in the main-stage questionnaire- in waves one, three and five.

[15]In Online Appendix A, we show that there is a weak positive correlation between both A-levels and university aspirations of parents and their children. These correlations are statistically significant but small in magnitude.

[16]Sensitivity analysis using father's aspirations is presented in Online Appendix B.4.

Table 4: Mothers' aspirations regarding their children's education by maternal educational attainment and household net income prior to the tuition reform

A. Aspirations by maternal education								
	A-levels and above		*Less than A-levels*				*No. of obs*	
	Mean	Std.	Mean	Std.	Difference	p-value	$\geq$ A-levels	$<$ A-levels
A-levels	0.7688	(0.4217)	0.6982	(0.4592)	0.0706	(0.0000)	2050	1915
University	0.9629	(0.1890)	0.9467	(0.2247)	0.0162	(0.0137)	2050	1914
B. Aspirations by household net income								
	Median and Above		*Below Median*				*No. of obs*	
	Mean	Std.	Mean	Std.	Difference	p-value	$\geq$ Median	$<$ Median
A-levels	0.7487	(0.4339)	0.7260	(0.4461)	0.0227	(0.1121)	1596	2369
University	0.9524	(0.2130)	0.9573	(0.2021)	-0.0050	(0.4577)	1596	2368

Note: All aspiration variables are based on binary definitions of high and low aspirations where high (low) aspirations are reported as 1 (0). Source: Understanding Society (waves 1-3, pre-reform period).

4 Econometric Model

In this section we lay out the formal econometric framework we utilize to evaluate the extent to which this large change in tuition fees has affected teenagers' and their parents' aspirations regarding A-levels and University education. The tripling of tuition fees, accompanied by an increase in financial support to needy families and by the expansion of the HE borrowing system, may have affected not only the demand for future higher education, but also the demand for those qualifications that are more relevant for accessing higher education, such as A-levels.[17] Our outcomes of interest are the educational aspirations of teenagers in secondary school and those of their mothers. Parental beliefs about the importance of the education of their children are likely important factors for the educational choices of teenagers and their aspirations are therefore also relevant for this analysis.

All aspiration measures are dummy variables that take a value of 1 when the individual reports high aspiration, and zero otherwise. We estimate linear probability models using a difference in

[17]The reform could also affect the expected return to Higher Education through general equilibrium effects. These could either arise from changes in the relative supply of graduates, caused by a decline in Higher Education enrolment or through fee-related changes in degree quality. Such general equilibrium effects would likely increase the expected return to a university degree and thus bias our estimates towards zero. Yet, the increase in fees was accompanied by a reduction in government grants to universities of similar size, so any quality adjustments would only arise from increased competition of universities for students. We assume that teenagers form their education attitudes focusing ceteris paribus on the much publicised increase in the net cost of attending Higher Education, and do not consider its potential general equilibrium effects on returns to a degree. We abstract here from these likely small general equilibrium considerations and consider any change in aspiration as due to the changes in costs.

difference approach, exploiting the timing of the reform and the differential impact that this reform has had on the different countries of Great Britain. The first specification takes the following form:

$$Aspiration_{ict} = \beta_0 E_{ic} \times T_t + \beta_1 W_{ic} \times T_t + \beta_2 E_{ic} + \beta_3 W_{ic} + \gamma X_{ict} + \mu_t + \epsilon_{ict} \quad (1)$$

$Aspiration_{ict}$ denotes the aspiration of individual i living in country c, in year t. E_{ic} and W_{ic} are binary variables to indicate individuals living in England and Wales, respectively. T_t is equal to one after the Higher Education Act was passed (i.e. December 2010), and zero otherwise. The vector of controls X_{ict} is composed of four groups. It includes time-variant individual characteristics such as urban residency and a flexible control for the teenagers' age; time-invariant individual characteristics such as ethnicity, gender or race; time-varying region specific characteristics such as unemployment rate and yearly log median annual pay; and time-invariant region characteristics such as education deprivation in 2012, measured by the proportion of adults who have no education or have left full-time education at the age of 16 or below. The inclusion of the controls not only can reduce the standard error of our estimates but, in the case of the time-variant variables, can also control for certain changes in the populations that would make the common trend assumption less likely to hold. Year fixed effects μ_t allow us to flexibly control for time variation in the demand for Higher Education. The error term ϵ_{ict} is assumed to be orthogonal to all the right hand side variables. The parameters of interest are β_0 and β_1 which describe how the aspirations of English and Welsh individuals evolve differently from those of Scottish individuals after the introduction of the reform.[18] The parameters of interest are β_0 and β_1 which describe how the aspirations of English and Welsh individuals evolve differently from those of Scottish individuals after the introduction of the reform.

We estimate separate treatment impacts for teenagers living in England and Wales, since as previously explained, policies enacted by the Welsh parliament effectively cancelled the fee increase for Welsh resident and only left them experiencing the change in the financing of higher education, while English pupils are exposed to all reform components. Indeed while for the average English

[18] In Online Appendix B.3 we compare the estimates of this specification with one including year and individual fixed effects and show that adding individual fixed effects does not qualitatively change our results.

student the reform increased the costs of participating in Higher Education, Welsh students might have benefited from a reduction in the overall costs and in the risk associated with a bad labour market outcomes, potentially making them more likely to aspire to attend higher education.

In the second step, we investigate whether the policy has had differential effects across families with different socio-economic backgrounds. While the policy has dramatically increased the cost of higher education on average, previous simulations have demonstrated a large amount of heterogeneity in the life-time costs, with poorer graduates becoming better off due to the insurance effect of the loan restructuring (Chowdry et al. (2012)). We therefore expand our model to include interactions of the treatment with a binary indicator of lower socio-economic characteristics of the parents, Low_i. We use two measures of socio-economic background: maternal education and household income. We define lower educated mothers as those who have qualifications below A-levels. We classify households with an income below the median in England, Scotland, and Wales as lower income households.

5 Results

If students' educational aspirations depend on the perceived costs and benefits of different education pathways, the increase in the life-time costs of higher education for the average graduate could have decreased English teenagers' aspirations to pursue higher education and thus A-levels. In Wales, fees remained at a lower level but the new financing scheme considerably reduced the risks associated with bad labour market outcomes following graduations which could lead to an increase in university aspirations. We focus particularly on the distributional impacts of the reform, which depend on the relative effects of the tuition fee increase and change in the financing for students from different backgrounds. Teenagers from lower socio-economic backgrounds are more likely to be financially constrained, and hence more likely to be discouraged by the increase in tuition fees and less generous terms on student loans, but other aspects of the reform might narrow the aspiration gap.

5.1 Teenagers' educational aspirations

Table 5 reports our estimates on A-levels and university aspirations. In columns (1) and (6), we report the key parameters of interest, β_0 and β_1 first for all pupils, then below for specific sub-populations. When considering all pupils, we estimate effects of the reform close to zero for English and Welsh teenagers (relative to their Scottish counterfactual) for both the aspirations to study for A-levels and for attending university. The estimates are not statistically significant. Assuming a power of 80%, we can exclude effects larger than a reduction in aspiration by 6 and 5 percentage points for A-level and university participation respectively for English teenagers. The minimum detectable effects are larger for the Welsh sub-sample, up to 9 percentage points reduction, due to the smaller sample size and reduced precision. Note that these effects are smaller than the effects of the reform on applications (-19%) and enrolment (-11%) (Sá, 2019). Overall, we estimate that the reform had no effect on the aspirations of teenagers in England and Wales, and can exclude effects larger than half of the impact that the reform had on applications. Given the significant gender gap in aspirations found in Table 3, we also report the differentiated effect of the reform by gender. For both A-levels and university, girls' aspirations are more sensitive to the reforms than boys but none of the parameters are statistically significant different from zero and the minimum detectable effects are of a similar order of magnitude as the one reported for the full population.

Since we cannot directly test the individual pupils' knowledge about the reform, as a proxy, we split the sample by age to test whether older teenagers, aged 13 to 15, react more strongly to the reform. They are closer to making A-levels and university participation choices, and may be better informed about the policy change. Indeed, for English teenagers, we find that the older age group revise their educational aspiration downwards, but even for this group, the estimates remain statistically insignificant.

Overall, we do not find that pupils overall or any specific sub-population significantly reacted to the Higher Education Act. Estimates are larger among females, older teenagers and English residents. Surprisingly, despite the reform having substantial differences on the costs of higher education in England and Wales, we do not find that Welsh teenagers reacted differently than their English peers.

We now expand the analysis to account for possible heterogeneity by socio-economic status in the effect of the reform. As detailed in Chowdry et al. (2012) poorer students and graduates experiencing worse labour market outcomes are better off financially under the new system. We thus present estimates of heterogeneous impacts of the reform on A-level (columns 2 to 5) and university aspirations (columns 7 to 10) for children of low and high socio-economic status in Table 5. We report our estimates for two aspects of socio-economic status - maternal education and household net income. The coefficients capture how the aspirations of English or Welsh teenagers from each socio-economic background evolve differently from their Scottish peers (with the same background) after the introduction of the reform.

In Table 3 we previously confirmed there was an aspiration gap by socio-economic background. However, we find no evidence of a statistically significant effects of the reform on aspirations to obtain A-levels or attend university in either socio-economic group and the point estimates on the specific effect for children with less educated mothers are actually negative. Similarly, we find no evidence that either English students from families with higher net income who are exposed to a strong increase in tuition fees *and* higher interest rates on student loans, or students from poorer families change their aspirations following the reform.

We additionally replicate the analysis for different sub-groups in terms of age and gender as before. The estimates of the reform impacts on A-level aspirations for English pupils from lower socio-economic background are in general negative, even when split by gender or age, and are never statistically significant. Similarly, aspirations to attend university drop post reform, but never significantly. For Welsh children, there is a wider range of results which are insignificant. We conclude that by and large the 2010 Higher Education Act had no effect on the aspirations of Welsh teenagers.

Despite the large redistributive effect of the reform, especially in Wales, we find no heterogeneous impact either by maternal education or household income, and thus no closing of the aspiration gap. This may be due to lack of knowledge among lower income students about the redistributive nature of student loans, since this information is more difficult to grasp than the tuition increase. Alternatively, it may be due to the inelastic nature of their aspirations. Indeed, Belfield et al. (2020)

report that beliefs about monetary benefits and costs play little role in shaping the educational aspirations of teenagers. These results are thus consistent with the frequently reported small 'sticker price' elasticity for the demand for higher education (Dearden et al., 2014; Azmat and Simion, 2020).

Table 5: Estimates of heterogeneous reform impacts on English and Welsh teenagers' educational aspirations by socio-economic status

	A-Levels Aspirations					University Aspirations				
		Maternal Education		*Household Income*			*Maternal Education*		*Household Income*	
	Overall	Low	High	Low	High	Overall	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: All pupils										
English	-0.0113	-0.0241	-0.0000	-0.0112	-0.0102	-0.0014	-0.0135	0.0009	-0.0149	-0.0030
	(0.0223)	(0.0524)	(0.0246)	(0.0449)	(0.0263)	(0.0194)	(0.0489)	(0.0201)	(0.0396)	(0.0224)
Welsh	0.0148	0.0266	0.0163	0.0098	0.0110	-0.0032	-0.0663	0.0241	0.0344	-0.0317
	(0.0329)	(0.0726)	(0.0418)	(0.0673)	(0.0473)	(0.0292)	(0.0664)	(0.0366)	(0.0593)	(0.0407)
Panel B: Female pupils										
English	-0.0313	-0.0628	0.0042	-0.0394	-0.0159	-0.0160	0.0346	-0.0217	-0.0415	-0.0039
	(0.0274)	(0.0644)	(0.0300)	(0.0561)	(0.0304)	(0.0222)	(0.0535)	(0.0233)	(0.0456)	(0.0234)
Welsh	-0.0225	0.0018	-0.0139	-0.0799	0.0216	-0.0203	-0.0364	0.0009	0.0424	-0.0629*
	(0.0395)	(0.0873)	(0.0520)	(0.0826)	(0.0571)	(0.0324)	(0.0712)	(0.0422)	(0.0612)	(0.0339)
Panel C: Male pupils										
English	0.0107	0.0188	-0.0027	0.0236	-0.0063	0.0181	-0.0674	0.0282	0.0193	-0.0013
	(0.0343)	(0.0786)	(0.0382)	(0.0684)	(0.0423)	(0.0317)	(0.0793)	(0.0327)	(0.0643)	(0.0379)
Welsh	0.0408	0.0451	0.0359	0.0953	-0.0075	-0.0006	-0.1145	0.0359	0.0286	-0.0169
	(0.0511)	(0.1109)	(0.0641)	(0.1034)	(0.0734)	(0.0483)	(0.1100)	(0.0593)	(0.0995)	(0.0709)
Panel D: 13-15 year old pupils										
English	-0.0272	-0.1106*	0.0183	-0.0580	-0.0042	-0.0213	-0.0251	-0.0132	-0.0428	-0.0116
	(0.0280)	(0.0671)	(0.0292)	(0.0568)	(0.0319)	(0.0247)	(0.0621)	(0.0242)	(0.0512)	(0.0275)
Welsh	-0.0034	-0.1156	0.0630	-0.0452	0.0210	0.0124	-0.1272	0.0720	0.0225	-0.0114
	(0.0406)	(0.0910)	(0.0526)	(0.0832)	(0.0573)	(0.0364)	(0.0829)	(0.0456)	(0.0744)	(0.0504)

We estimate a Linear Probability Model with year fixed effects, controlling for regional annual unemployment rate, median annual pay and educational deprivation by government office regions, and for age, ethnicity, and urban residency. The outcomes are reported as 1 for high aspiration and 0 otherwise. Mean A-levels and University aspirations are 0.82 and 0.85, respectively. Maternal education is classified as high if mothers have an education of A-levels or above. High income households are classified as those with net income of median or above. Sample size for the All pupil panels are 20,411 for A-levels aspirations and 18,128 for University aspirations. Robust standard errors are reported in parentheses. *, **, *** denote statistical significance at the 10, 5, and 1 percent levels, respectively.

To test the robustness of our results, we exclude children interviewed around the time of reform (and therefore partially treated), and estimate separately whether children affected by the contemporary policy Raising of School Leaving Age (ROSLA) may alter our results. We also discuss the estimates of an alternative specification that includes pupils' fixed effects for more detail). While naturally different approaches lead to quantitatively slightly different results, the main results remain unaltered (see Online Appendix B for more details).

5.2 Mothers' educational aspirations

In this section, we investigate whether parental aspirations towards their children's A-levels attainment and university participation changed following the passing of the 2010 Higher Education Act. We focus on mothers to avoid sample selection issues arising from absent fathers. Parental aspirations may be more reactive to these policy changes for three reasons: first, parents may follow the news more closely and be better informed about the details of the reform; second, since parents provide substantial financial support for their children's higher education investments, they may be more susceptible to changes in the cost of Higher Education.[19] Finally, parents may be better informed about the returns to such education investments and may have higher preferences for their children's education if they take a more forward-looking long-run perspective on such investments than their children.

Following a similar format, we report estimates of the reform on maternal aspirations in Table 6. For the full population, and separately by gender, we find that the reform had a limited and imprecisely estimated effect on parental aspirations both in England and Wales. However, for parents of older pupils we find a large and marginally significant increase in A-levels aspirations in Wales but surprisingly a non-significant reduction in the aspirations to attend university. English mothers also become 4 percentage points less likely to state that they wish their child to attend university, which is statistically significant at the 5% level.

These somehow ambiguous findings hide important heterogeneity in the effect of the reforms by family background. In both England and Wales, less educated mothers become at least 20

[19] A 2019 survey of parents whose child is at university reported that 84% of parents financially supported their child during their studies, for an average of £360 per month (Which? University Parent Survey 2019).

percentage points more like to aspire for their child to study for A-levels and between 8 and 10 percentage points more likely to want them to attend university. In contrast, more educated mothers revised their aspirations downwards, especially regarding higher education participation. This results in a substantial reduction of the aspiration gap by 14 to 17 percentage points.

For households with income below the median, we find similar increases in aspirations. In addition, there is a statistically significant decline in university aspirations by about 5 percentage points among all English mothers with higher net household income (column 10), and a rise of similar magnitude in such aspirations among poorer mothers (column 9), with even larger increases in Wales. Again, the results are stronger for mothers whose children are close to making further and higher education choices with the higher education aspiration gap closing by 15 percentage points for pupils aged 13-15 in England, and 23 percentage points in Wales.

Here it is important to mention that the abolition of education maintenance allowance (EMA) in England was announced around the same time as the announcement of the change in financing of higher education. EMA was a means-tested transfer paid to pupils aged 16 to 18 if they remained in education. This policy change could bias our estimates of the effect of the Higher Education Act towards zero. We therefore expect the estimated positive impact of the change in HE financing on parental aspirations from lower socio-economic backgrounds to be understated which may explain the smaller positive impact of the reform on lower income English as compared to Welsh households. This bias is however likely to be small as Chowdry and Emmerson (2010) report that 88% of recipients would have participated in education even in the absence of the EMA.

Well-informed mothers who understand the reform's cost implications increased their aspirations regarding university attendance of their child, if less educated or poor, and reduced them otherwise; in line with the heterogeneous effect of the reform on the total cost of attending university. The maternal aspirations gap closes, albeit by a combination of dis- and encouragement effects. Additionally, we see similar results regarding the importance mothers ascribe to A-level attainment (see columns 2 and 3): while the discouragement effect on the aspirations of more educated mothers is not statistically significant, we find an economically and statistically significant increase of 20 percentage points in the aspirations of lower educated mothers.

Table 6: Estimates of reform impacts on English and Welsh mothers' aspirations towards their children's education

	A-levels Aspirations					University Aspirations				
		Maternal Education		*Household Income*			*Maternal Education*		*Household Income*	
	Overall	Low	High	Low	High	Overall	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: All pupils										
English	0.0114	0.0584	-0.0063	0.0019	0.0105	-0.0227	0.0334	-0.0356*	0.0512*	-0.0472*
	(0.0289)	(0.0639)	(0.0335)	(0.0574)	(0.0383)	(0.0156)	(0.0337)	(0.0186)	(0.0307)	(0.0244)
Welsh	0.0502	0.1405	0.0010	0.1298	-0.0433	-0.0065	0.0525	-0.0266	0.1162**	-0.0663
	(0.0483)	(0.1007)	(0.0620)	(0.0972)	(0.0717)	(0.0263)	(0.0550)	(0.0309)	(0.0546)	(0.0447)
Panel B: Female pupils										
English	0.0431	0.0261	0.0301	0.0015	0.0404	-0.0226	0.0100	-0.0288	0.0194	-0.0305
	(0.0391)	(0.0872)	(0.0436)	(0.0788)	(0.0465)	(0.0189)	(0.0428)	(0.0206)	(0.0365)	(0.0285)
Welsh	0.0512	0.1827	-0.0336	0.1512	-0.0588	-0.0272	-0.0301	-0.0087	0.1136**	-0.0946**
	(0.0669)	(0.1385)	(0.0845)	(0.1340)	(0.0957)	(0.0303)	(0.0640)	(0.0418)	(0.0536)	(0.0377)
Panel C: Male pupils										
English	-0.0188	0.0849	-0.0379	0.0065	-0.0267	-0.0238	0.0557	-0.0424	0.0867*	-0.0677*
	(0.0423)	(0.0931)	(0.0502)	(0.0840)	(0.0607)	(0.0246)	(0.0521)	(0.0302)	(0.0498)	(0.0398)
Welsh	0.0489	0.1034	0.0268	0.1144	-0.0406	0.0109	0.1340	-0.0427	0.1313	-0.0507
	(0.0695)	(0.1455)	(0.0888)	(0.1406)	(0.1060)	(0.0425)	(0.0901)	(0.0455)	(0.0913)	(0.0766)
Panel D: Pupils aged 13-15										
English	0.0406	0.2027**	-0.0295	0.0417	0.0202	-0.0398*	0.1062**	-0.0796**	0.0749	-0.0770**
	(0.0408)	(0.0853)	(0.0505)	(0.0811)	(0.0538)	(0.0234)	(0.0458)	(0.0310)	(0.0461)	(0.0360)
Welsh	0.1332*	0.2358*	0.0517	0.1925	0.0017	-0.0366	0.0825	-0.0648	0.1888***	-0.1299**
	(0.0681)	(0.1387)	(0.0912)	(0.1380)	(0.1024)	(0.0351)	(0.0706)	(0.0457)	(0.0708)	(0.0578)

We estimate a Linear Probability Model with year fixed effects, controlling for regional annual unemployment rate, median annual pay and educational deprivation by government office regions, and for age, ethnicity, and urban residency. The outcomes are reported as 1 for high aspiration and 0 otherwise. Mean maternal A-levels and University aspirations are 0.73 and 0.95, respectively. Maternal education is classified as high if mothers have an education of A-levels or above. High income households are those with net income of median or above. Sample size for the All pupil panels are 11,001 for A-levels aspirations and 10,971 for University aspirations. Robust standard errors are reported in parentheses. *, **, *** denote statistical significance at the 10, 5, and 1 percent levels, respectively.

In summary, despite the prominent media coverage of the tuition fee increase in the media, we find no evidence that a large increase in the cost of Higher Education discouraged teenagers' aspirations towards advanced qualifications or Higher Education. Yet, we do find that their parents react to the reform. Mothers' aspirations for their children change in line with the financial incentives set by the reform; richer parents adjust their aspirations downwards in reaction to the substantial increase in the expected cost of higher education, while poorer parents' aspirations increase in line with the expansion of financial support available to their children in the future, which is combined with insurance against the risk of higher education via the increased repayment threshold. This is observed for mothers whose children are close to making their decisions regarding higher secondary education, who are likely better informed about the costs of higher education than mothers of younger children. These results are consistent with the findings of Azmat and Simion (2020) and Murphy et al. (2019) who estimated that the Higher Education Act 2010 reduced the participation gap in higher education, mostly through its deterrence effect for children originating from higher income families.

6 Conclusion

Increasing higher education attendance of students from lower socio-economic backgrounds has been one of the main focuses of policy makers in the UK and in many other developed countries. Despite a wealth of reforms the participation gap by social background has remained stable at about 30 percentage points over the last two decades, both in the UK and the US. While potential reasons for the widely known and persistent socio-economic gap in university participation cover a wide set of potential explanations ranging from financial constraints, to lack of information about the costs and benefits of a university degree, lower level of preparednesss, and differences in debt risk aversion, the origins of the gap are still disputed. A frequent argument is that children from lower socio-economic backgrounds may have lower educational aspirations, and that these may be an important factor in the decision whether to participate in Higher Education.

In this paper, we contribute to the surprisingly scarce evidence on the educational aspirations of teenagers and of their parents. We focus on aspirations towards advanced secondary education

qualifications, which are the basis of access to higher education, and towards university participation. We study the impact of the Higher Education Act 2010 which substantially raised tuition fees for students but also had redistributive elements – through the increased repayment threshold for income-contingent tuition loans and the expansion of financial support for students from lower socio-economic backgrounds. We investigate whether this reform affected the education aspirations of potential future students, i.e. teenagers aged 10 to 15, and of their parents, and whether the redistributive elements of the financing reform help reduce aspiration gaps by social background.

We exploit variation in the implementation of the 2010 Higher Education Act across the constituent countries of Great Britain, in a difference-in-difference approach. Four key findings emerge. First, we find no significant effect of a large increase in tuition fees on the aspiration of teenagers to obtain advanced secondary education qualifications or attend university. Second, while we find significant socio-economic and gender gaps in these aspirations among teenagers at baseline, the Higher Education Act 2010 did not alter them significantly. Despite the reforms' redistributive elements, effects of the reform appear homogeneous. Third, despite large differences in the implementation of the Act between England and Wales, with Welsh pupils unaffected by the increased tuition costs but benefiting from redistributive changes in financial study support, the effects on aspirations are very similar between pupils in both countries. Despite intensive media coverage around the change of legislation, teenagers' aspirations about higher education investment are not responsive to even large, widely communicated policy changes.

Our fourth main finding is that in contrast, parental aspirations regarding their children's education do respond to the reform, and their response reflects the financial incentives set by policy-makers. Richer parents adjust their university aspirations downwards in reaction to the substantial increase in the expected cost of higher education, while poorer parents' aspirations increase in line with the expansion of financial support available to their children in the future, and a reduction in the financial risk of poor labour market outcomes due to the increased income threshold at which debt repayment must be made. Altogether, the socio-economic gap in parental aspirations regarding their children going to university shrank substantially.

Our results are thus consistent with previous evidence that teenagers educational aspirations are

not predominantly shaped by financial considerations concerning the costs and benefits of higher education but mostly by the "consumption value of university' (Belfield et al., 2020), rendering the demand for university education price insensitive. Indeed, the 2010 Higher Education Act was found to have little impact on the demand for higher education overall (Azmat and Simion, 2020; Sá, 2019) but reduced the social gap in participation (Azmat and Simion, 2020). Policies to reduce the social gap in participation may thus focus on increasing the "consumption value of university' for children and on lifting parental aspirations for children from lower socio-economic background. Finally, it should be noted that our results are obtained in a universal income-contingent loan environment, which naturally reduces the downward risk associated with future low wages. This environment might contribute to the insensitivity of teenagers' aspirations to large changes in the sticker price of higher education, even for pupils originating from lower socio-economic background.

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