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Universities and Industrial Strategy in the UK

Review of Evidence and Implications for Policy

Ghazala Azmat, Richard Murphy, Anna Valero and Gill Wyness

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Ghazala Azmat*, Richard Murphy**, Anna Valero*** and Gill Wyness****

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Abstract

As producers of human capital, innovation and as large institutions in their own right, UK universities can make important contributions across the five foundations that underpin the government's Industrial Strategy: people, ideas, place, business environment and infrastructure. While few would dispute the potential contribution of universities in all these areas, it is less clear how it can be maximised. The sector has witnessed a number of reforms in recent years and there is much debate about future policy, in particular with respect to its financing, expansion, globalisation and economic impact. This paper provides a synthesis of the relevant data and economic literature, together with implications for policy. To ensure that young people in the UK are able to realise their productive potential it is important to improve the accessibility of the university system for poorer students, and address variability in the quality of teaching (particularly as the sector expands). Financing reforms to date have not harmed accessibility, but a fairer maintenance system together with better information and advice for prospective applicants could help close the participation gap and improve matching of students to courses. Universities are a core part of the UK's innovation infrastructure, but more can be done to improve the commercialisation of research, and the diffusion of existing technologies. Policies in these areas should be designed with evaluation in mind. Finally, UK universities must remain open to talented international students and staff, who make a key contribution to the quality of the sector and its impact.

JEL Classification: I23; I26; J24; O25; O30

Keywords: higher education, universities, industrial strategy, growth, innovation

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* Sciences Po and CEP (LSE), email: ghazala.azmat@sciencespo.fr

** University of Texas at Austin and CEP (LSE), email: richard.murphy@austin.utexas.edu

*** CEP (LSE), email: a.a.sivropoulos-valero@lse.ac.uk

**** UCL and CEP (LSE), email: g.wyness@ucl.ac.uk

INTRODUCTION

The UK has a world leading university sector and this has a key role to play in moving the country onto an inclusive and sustainable growth path. As producers of human capital, innovation and as large institutions in their own right, universities make important contributions across the five foundations that underpin the government's Industrial Strategy White Paper (HMG, 2017). In particular, universities support the productivity and prospects for **people** through the education of students and the nurturing of researchers. Via their research activity, universities generate innovation or **ideas** and create spillovers for businesses in the economy. There is a strong element of **place** as universities impact on their local economies via the production of human capital and innovation, and by other forms of interaction with local industry. Universities therefore affect the **business environment** implicitly through these mechanisms, and can also affect it explicitly through mechanisms such as university incubator schemes. Finally, universities have a role in producing the innovation required to underpin modern, resilient and sustainable **infrastructure** across the country, including the development of smart cities. Moreover, the skills and research developed in universities, in many cases in collaboration with businesses, will be crucial for addressing the four "grand challenges" of Artificial Intelligence and the data economy, clean growth, the future of mobility and ageing society.

While few would dispute the potential contribution of universities in all these areas, it is less clear how positive impacts can be maximised. The sector has witnessed a number of reforms in recent years and there is much debate about future policy. This paper considers key questions in the following areas:

- **University finance, admissions and inclusiveness:** How can university finance and admissions policies improve accessibility for students from less well-off backgrounds?
- **Expansion of the university sector: quality vs quantity?** How far should the sector be expanded? How can trade-offs between quality and quantity be managed?
- **The international nature of UK universities:** How can the university sector continue to attract the best international students and staff?
- **Universities and their local economies:** How can positive impacts of universities on local and regional economies be maximised?

In each area, we provide a synthesis of what the data and economic literature tell us and what this implies for optimal policy in the UK.

1. UNIVERSITY FINANCE, ADMISSIONS AND INCLUSIVENESS

Allowing young people to realise their productive potential is important on equity grounds and for improving social mobility, but also in terms of improving the UK's productivity performance. Indeed,

in its discussion of “people”, the Industrial Strategy White Paper highlights the need to reduce disparities in education, and remove barriers that prevent those in under-represented groups from realising their potential. In recent years there have been substantial improvements in university participation among students from disadvantaged backgrounds. However, there remains a significant gap between disadvantaged students and their advantaged peers, particularly at the most selective universities. UCAS figures show that the most advantaged applicants are six times more likely to enter a high tariff institution compared to the most disadvantaged. The large socio-economic gap in HE participation is driven primarily by prior attainment but research has shown that even after prior academic attainment is taken into account, state school students are still significantly under-represented at leading universities (Crawford et al., 2016). The real or perceived cost of university to the student and their families, and the admissions process itself are both likely to have differential impacts on applications from disadvantaged students and their better off peers.

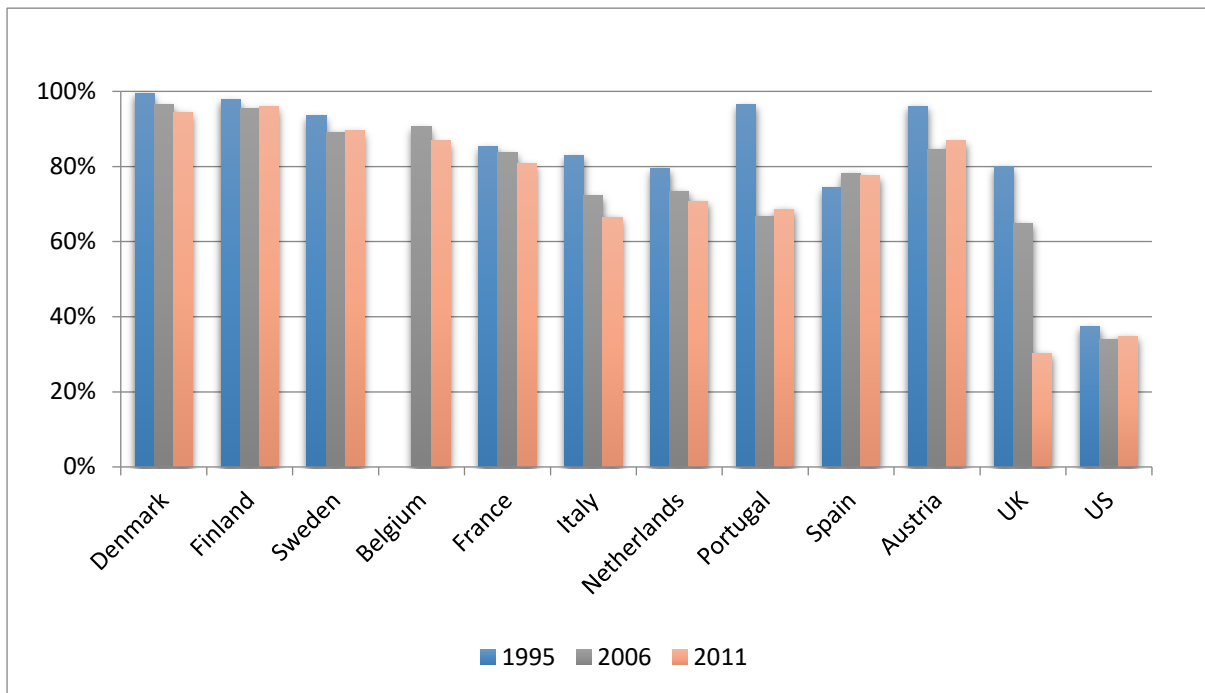
1.1 University Finance in the UK

Higher education funding has become one of the most highly debated public policies of recent times, following a number of reforms including the introduction of fees and subsequent increases, and the conversion of university maintenance grants to loans. Student finance was a prominent topic during the last election – for instance, the Labour Manifesto of the June 2017 election announced plans to abolish university tuition fees. In February 2018, a major review of post-18 education and funding was announced. While government has ruled out scrapping tuition fees, it has been signalled that this review will consider how to give students better value for money. A key concern for many has been the extent to which financing reforms might deter admissions from disadvantaged students. So far, the evidence suggests that enrolments from disadvantaged students have not suffered from the introduction of fees, due to the accompanying loans and maintenance support. But still there are many, across political parties, who call for fees to be reduced or abolished entirely.

Overview of financing reforms 1998-2012

Over the past two decades, through a series of reforms, the UK has moved from a system that offered students university education for free to one charging significant fees, accompanied by systems of support for less financially advantaged students. These reforms have been motivated by constraints to public expenditure and the need to meet increasing costs of the sector, due both to its expansion and the desire to maintain quality in terms of funding per student. Over the course of the reforms, the amount of direct public expenditure on higher education fell from 80 per cent to around 25 per cent (see Figure 1.1).

Figure 1.1: Share of Higher Education Costs Covered by Public Expenditure



Notes: The graph shows the trends in the share of higher education costs, covered by public expenditure across different countries. Source: OECD Indicators, 2013, 2014, 2015. Taken from Azmat and Simion (2018).

The first reform, effective from 1998, obliged students to pay a maximum of £1,000 per year. The amount paid by each student, however, depended on their family income. Students from less financially advantaged households (less than £23,000 per year) were exempt from paying fees. Students from households where the family income was between £23,000 and £35,000, paid a reduced amount, while those whose families earned more than £35,000 were charged the full fee.

The Higher Education Act of 2004, which took effect from 2006, changed the tuition regime again. Under this reform, all students – irrespective of household income – were obliged to pay tuition fees, where the maximum amount of tuition fee trebled to £3,000 per year (inflation indexed). Universities were given discretion over the level of tuition fees charged, although most universities charged the maximum fee permitted of £3,000. In 2010, further reforms were announced and with respect to tuition fees, the most important change being that fees would increase to a maximum of £9,000 per year from 2012.

As well as the introduction of tuition fees, the major higher education reforms introduced methods to support less financially advantaged students to pay for tuition fees and maintenance during higher education. The most prominent being the “Student Loan,” which meant that all students – irrespective of their household income – were eligible to apply for tuition fee loans from a government-backed student loans company. The loans covered the entire cost of tuition fees and were to be paid in

instalments after graduation, only once their income level exceeded a certain amount. The threshold was set at £15,000 for those affected by the 2006 reform and later increased to £21,000 for those affected by the 2012 reform, today the threshold is £25,000. The loans were repayable with some interest, 1.25 per cent in 2006, and in 2012 the interest rate was set at the maximum of RPI plus 3 per cent for graduates earning more than £41,000. Loans are written off if not repaid after 30 years.

There were also changes to the system of means-tested related support. Means-tested maintenance grants, which stood at around a maximum of £949 in 1998, were completely abolished in 1999, re-introduced at a maximum of £1,000 in 2004, and substantially increased to a maximum of £2,700 in 2006 and £3,250 in 2012. Students were also eligible to access means-tested loans, which were offered zero real interest rate and up to around £4,000 in 2006 and to £5,200 in 2012. Table 1.1 summarizes all the fees and the financial support available to students based on their family income level under each of the three fee regimes.

Table 1.1: Available Support by Income Group Under All Three Fee Regimes

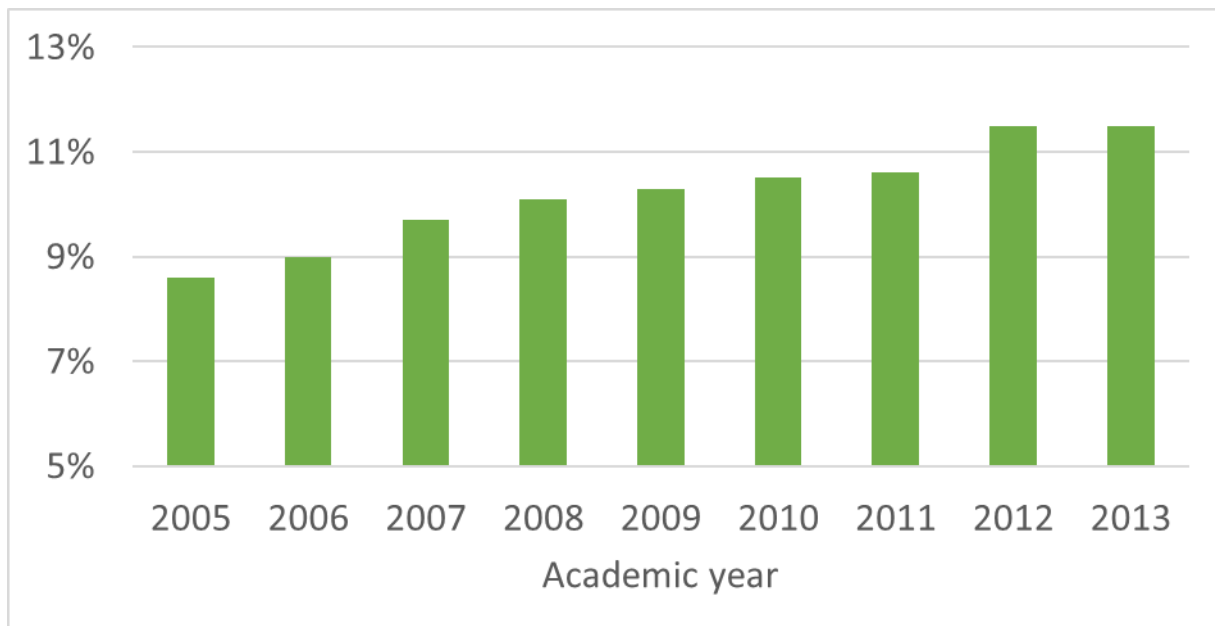
Parental Income (£)	Tuition Fees (£)			Maintenance Grants (£)			Max Maintenance Loans (£)		
	1998	2006	2012	1998	2006	2012	1998	2006	2012
<=10,000	0	3,000	9,000	949	2,700	3,250	2,255	3,205	3,875
20,000	373	3,000	9,000	949	2,284	3,250	2,255	3,205	3,875
30,000	1,172	3,000	9,000	569	832	2,341	2,315	3,573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

Notes: The figures for maintenance grants and maintenance loans refer to students who do not study in London and do not live at home with their parents. Source: Student Loan Company, taken from Azmat and Simion (2018).

Financing reforms and inclusiveness

Recent research studying the impact of these reforms finds little impact on the enrolment rates of students from different socio-economic backgrounds, including those from a more disadvantaged background (Murphy, Scott-Clayton and Wyness, 2017; Azmat and Simion, 2018). In fact, the percentage of English domiciled first year full-time undergraduates from low participation neighbourhoods has been steadily increasing over the period of HE reforms, without any significant change in trend around the time of the major HE reforms (Figure 1.2).

Figure 1.2: Percentage of English Domiciled First Year FT Undergraduates from Low Participation Neighbourhoods

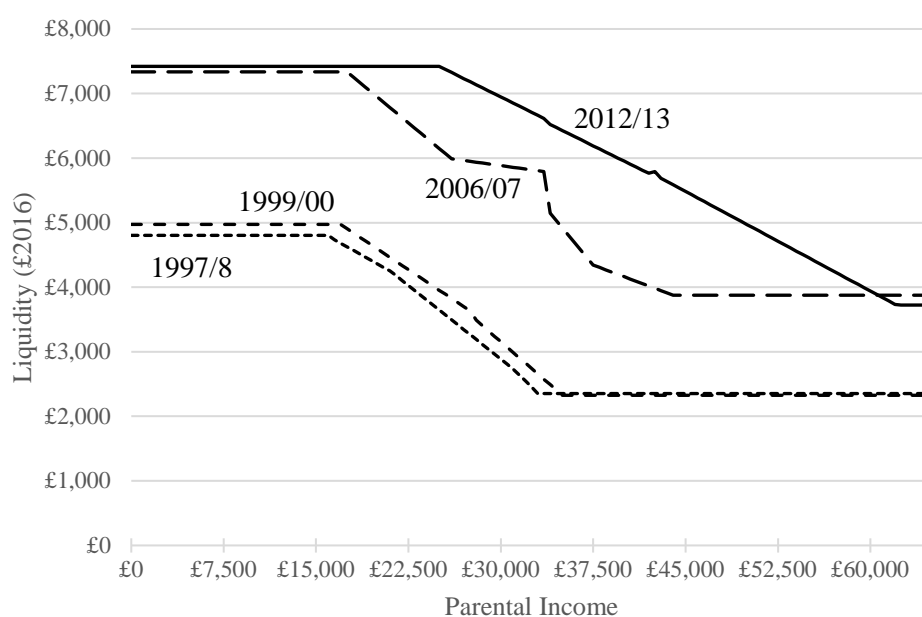


Notes: The low participation neighborhoods are areas with the lowest participation rates of 18 year olds (quintile 1) and are considered to be the most disadvantaged. Source: HESA statistics.

The design of the payment system might explain why the effects were small. Although all students were obliged to pay tuition fees from 2006 onwards, there was progressivity in upfront costs through increases in means-tested grants. Moreover, there was a release in financing constraints with access to additional loans and protection against personal bankruptcy due to student loans. Figure 1.3 shows, by parental income, that students experienced an increase in liquidity over time. The introduction of fees in 1998 had little impact on liquidity as they were matched by increases in maintenance loans. The changes in the 2006 fee structure were accompanied by sharp increases in loans and grants, resulting a substantial increase in liquidity for the lowest income group. The reform benefited those from lower-middle income families (those earning £33,000) the most, increasing access to credit by £3,400. The 2012 reform had little benefit in terms of liquidity for lower income households but it increased for those in the middle or higher income brackets.

While overall financing reforms have not deterred entry from disadvantaged students, the extent of student loan repayment over the coming years will influence the overall welfare impact of the recent reforms, as that will determine the full cost to the taxpayer.

Figure 1.3: Net Liquidity (Grants + Maintenance Loans – Up Front Fees) by Parental Income and Fee Regime



Notes: Based on analysis in Murphy et al., (2017) using data from Student Loans Company, 1991-2015. Figures expressed as amounts per year. The unweighted average liquidity for students between £0 and £60,000 parental income was 1987/8 - £3,321, 1999/0 - £3,430, 2006/7 £5,520 and 2012/13 £6,241

More recent reform of maintenance funding

In 2016, maintenance grants were replaced with increased maintenance loans. It is still too early to assess the impact of this change. However, this type of policy is regressive by its nature, as it implies that students from poor backgrounds will now graduate with more debt than those from better off backgrounds. Evidence from the UK and also the US looking specifically at maintenance grants, suggests that their withdrawal may harm students.¹ While there is little research which studies the replacement of grants with loans (as opposed to the pure withdrawal of grants), one study from the US suggests this may have less of an effect, except for minority students.²

In fact, there have been indications that following the government’s review of post-18 education maintenance grants may be reintroduced.³ But if this does not happen, it is important to consider how any potential negative impacts can be mitigated. In the absence of maintenance grants, student bursaries (which are decentralised to universities) are the major source of non-repayable aid. It has been shown

¹ See Dearden et al (2014) for evidence from the UK which found a positive effect of the introduction of grants on participation, and Dynarski (2003) for evidence of reductions in participation from their removal in the US.

² See Linsenmeier et al (2006).

³ See discussion in Belfield et al. (2018).

that richer, more elite universities give out fewer but more generous bursaries for the bright poorer students who are accepted there (Wyness, 2015). But poor students are less likely to gain access to elite universities, and, such universities tend to put more resources into their bursary schemes. Therefore, a large proportion of students from poorer backgrounds will have less access to non-repayable financial assistance. Other mitigating policies may include strengthening careers services and information provision, as discussed in the next section.

1.2 Admissions processes

There are a number of attributes of the UK university admissions system that might be putting students from poorer backgrounds at a disadvantage, leading them to make suboptimal choices, and to end up at institutions that are less selective than they could attend based on their grades (Wyness, 2017).

First there are issues around the applications and course choice stages. Research on student destinations suggests that students from disadvantaged backgrounds end up at lower quality universities than their richer counterparts, even conditional on grades, suggesting that they are making suboptimal choices at the application stage (Chowdry et al., 2013). Analysis of the match quality of low and high socio-economic status (SES) students to courses in the UK, taking into account their own ability, shows that high attaining, high SES students are more likely to be matched or overmatched, while high attaining, low SES students are more likely to be under-matched (i.e. enrolled on courses where the median student is lower attaining than they are).⁴ Providing better information is likely to help address these issues - for example a study by McGuigan et al. (2016) suggested that many students do not know basic facts about the costs and benefits of pursuing post-compulsory education - but research suggests that individually tailored and targeted information is more likely to be effective than generic information provision, for example via a website.⁵

Second, a high proportion of university offers are made based on predicted rather than actual school examination grades. Wyness (2016) shows that among high achievers, those from poorer backgrounds are more likely to be under-predicted (i.e. their predicted grade is lower than the grade they eventually achieve), which will have an adverse effect on their ability to access higher quality universities. The complexity of a system based on predictions also implies that the best informed schools and colleges are better able to advise students on where they should apply – for example some universities might make offers to students with predicted grades lower than the advertised grades. Indeed, Wyness (2017)

⁴ See Wyness (2017). Interestingly, low ability low SES students are more likely to be matched to courses with similar peers, while low ability high SES students are more likely to be over-matched- i.e. attending courses with higher ability peers.

⁵ See, for example, McGuigan et al., 2016 that studied an information campaign via a website in the UK, and Hoxby et al., 2013 that studies the impact of a more targeted programme in the US. Evaluations of a number of other programmes are summarised in Wyness, 2017).

shows that for students with a 14 grade point prediction, 52% of high SES students apply to the Russell Group, compared with only 42% of low SES students.

Third, the “personal statement” is a key part of the application process, through which students are expected to document ambitions, interests and relevant skills. There is some evidence that students from grammar and independent schools submit higher quality statements, and benefit from inputs from their school and/or parents (Jones, 2013). Moreover, such students are more likely to be able to access relevant work experience and extra-curricular opportunities. Use of prompts in the personal statement might help level the playing field.

Finally, there is a general lack of transparency and consistency in university admissions. While many universities use contextual admissions (looking at a student’s predicted grades in the context of the quality of their school, socio-economic background and other factors) to widen access, the extent of this, and the weights placed on different data varies by institution (Boliver et al, 2017). This puts students with less of an understanding of the system at a disadvantage, and is further justification for providing such students with more help navigating it.

2. EXPANSION OF UNIVERSITY SECTOR: QUALITY VS QUANTITY?

Universities in the UK are generally considered to be of high quality, with a number of universities placing high in international world rankings. For example, in Shanghai’s Jiao Tong University’s ranking two UK universities appear in the top 10 world rankings and seven in the top 50 (Jiao Tong, 2016).

Today there are around 160 higher education institutions in the UK in receipt of public funding through research funding and (in some cases) teaching grants, and privately through tuition fees (as described in Section 1), of which around 130 are considered to be “universities” (i.e. able to award degrees). Due to historical reliance on government funding, UK universities have been heavily regulated by the government, most notably through the existence of student number caps, designed to limit the cost of higher education to the public purse. In recent years, however, there has been a move towards expanding the sector, both through lifting of caps allowing university expansion in enrolments, but also through allowing new entrants and the upgrading of university colleges or other higher education institutions to provide them with degree awarding powers.⁶

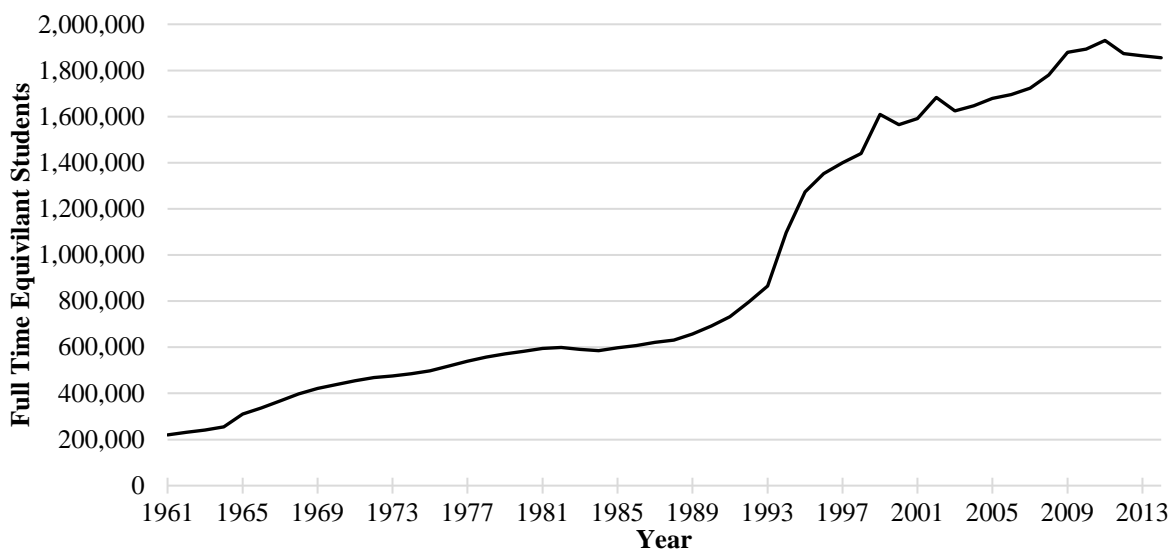
2.1 Expansion since the 1960s

Since the early 1960s, around the time of the influential Robbins Report on Higher Education (Robbins, 1963), the UK higher education sector has been characterised by periods of intermittent expansion,

⁶ These changes were outlined in the government’s white paper on higher education (BEIS, 2016).

followed by steady but sustained growth (Figure 2.1). In the 25 years from 1961 to 1986 the total (full time equivalent) UK undergraduate student almost doubled, but in the decade from 1986 to 1996 enrolment increased almost fourfold. The reasons for this rapid increase are both demand and supply driven. For example, increases in the proportion of students staying on at school (see Blanden et al. 2005), and rising demand due to increases in the economic returns to college during the late 1980s and 1990s (Blanden and Machin, 2004) increase demand. Government intervention was also partly responsible for the expansion, most notably in the 1990s when polytechnics were put under the same funding arrangements as universities, meaning they could become independent universities and award their own degrees (Williams, 1997).⁷ Thus, in 1997, the Labour government inherited a massively expanded higher education system. Nevertheless, Labour continued to encourage expansion in the sector, with Tony Blair famously setting a target of a 50% participation rate by 2010 as a flagship policy (to be at least in part funded through the introduction of tuition fees, as described in Section 1).

Figure 2.1: Full-time Equivalent Enrolments Over time



Notes: Statistics for 1961-2002 are taken from Carpentier (2004) and Statistics for 2002-2014 taken from Higher Education Information Database for Institutions. FTE enrolments contain all student types (full-time, part-time, postgraduate, undergraduate, UK, EU, overseas); increase in 1994 is partly due to students entering HE from ex-polytechnics.

However, recent applicant data from UCAS indicates that the expansion may be on the wane. Applicants decreased by 2.6% in the 2017 cycle, with 18,500 fewer applicants than 2016 (UCAS 2018). This was

⁷ Students attending polytechnics could study towards bachelors, masters, and PhD level qualifications. These students were eligible for the same funding, and applied for places through the same system (UCAS). The key difference was that the awarding of qualifications was done by a quasi-governmental agency, to ensure high standards. As such polytechnics were seen as lower ranked, performed less research, had lower entry requirements and concentrated on applied sciences and engineering.

the second successive fall in applicants following a small decline in 2016. Both UK and EU student numbers were down, (the latter potentially reflecting concerns over Brexit – see McNally and Wyness, 2017) though non-EU applicants continued to increase. Interestingly, entry rates among 18 year olds continued at record levels, while the decreases were driven by those aged 19 or over (particularly those aged over 21). Among 18 year olds, applications among disadvantaged students (as measured by Polar 3, UCAS’ preferred measure of disadvantage, which is based on the area of residence of the applicant) continued to increase. In the latest available data for 2018,⁸ applications from domestic students continued a modest decline and non-EU applications continued to rise, but there was actually an upturn in EU applications which reached their second highest level recorded.⁹

Student number controls

Given the sector’s historically strong reliance on public funding, expansion has been costly for government. In response to these concerns, in November 1993, the Higher Education Funding Council (HEFCE) began setting number controls, with a maximum allowable student number (MASN) for each university, including all home fee undergraduate and taught postgraduate students (Murphy, Scott-Clayton and Wyness, 2018).

This system remained in place until 2012/13, when a significant shake-up was announced by the Conservative government in the higher education white paper; the numbers cap was gradually removed over the period between 2012/13-2015/16, starting with unlimited recruitment of students achieving at least AAB or equivalent in their A-level examinations, relaxing to AAB in 2013/14, and full removal of the cap in 2015/16 (Wyness and Murphy, 2016).

The rationale for this reform was likely the intent to produce a higher education market, which had failed to materialise even after the tuition fee cap was raised to £9,000 per year. The idea was improved market efficiency: the most popular university courses could expand, while the less popular would decline and close. Increasing supply so that it would match, and one day exceed, demand for places, thus dragging down the average fee level.

The evidence in the 3 years over the cap removal period (2012-2015) suggests that some institutions have begun to expand and some have contracted (McCaig, 2016). Analysis has shown that pre-1992 institutions have been most likely to expand over the period since the removal of numbers caps, and more likely to expand at a greater rate than post-1992s. The offer rate (proportion of applicants receiving

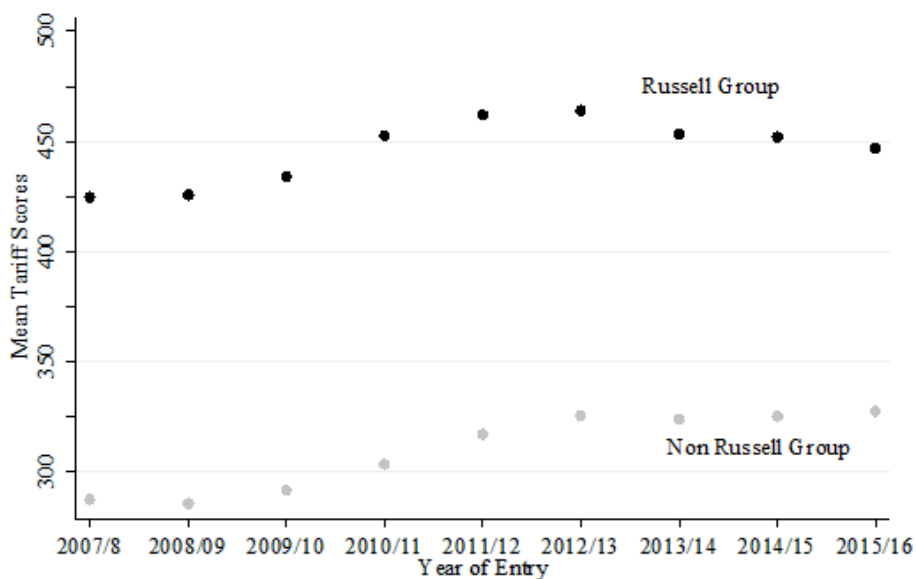
⁸ At the time of writing, the 2018 “UCAS Undergraduate End of Cycle Report” has not yet been published. For applicant numbers in 2018 see <https://www.ucas.com/data-and-analysis/ucas-undergraduate-releases/ucas-undergraduate-applicant-releases-2018-cycle>

⁹ This was interpreted at the time as a last minute rush to study at British universities before Brexit closes the door. See more discussion in Section 3.

an offer) has also risen, increasing by 21 per cent between 2012 and 2016 (UCAS, 2017). In particular, there have been large increases in unconditional offers (UCAS, 2017).

Figure 2.2 also suggests some impact of the removal of the caps at the more selective Russell Group universities. This shows the average entry tariff score for students between 2007–2015 for the Russell Group and all other universities, weighted by enrolment. Both groups are increasing up until 2012, after which there is a fall in the average entry scores of Russell Group students. There is no evidence that this fall reflected declining ability of young people in general. Indeed, the average high school grade was increasing up to 2011, and remained stable thereafter (JCQ, 2016). Moreover, it is unlikely that the HE finance regime was somehow directly accountable for this widening of access to lower attaining students. Rather, it is more likely linked to the removal of the caps. Evidently Russell Group universities appeared to have lowered their entry standards in order to expand, resulting in this fall in average tariff scores. It is notable that tariff scores of the other universities did not drop, likely reflecting the fact that only a small proportion of their student body would be affected by the initial relaxations.

Figure 2.2: Average Entry Tariff Scores by University Type



Notes: Weighted average of student entry qualifications. For A-Levels the points are A* 140, A 120, ...E 40. For AS-Levels the points are A* 70, A 60.... E 20. All qualifications are counted, even those that are not part of the entry requirement e.g. General Studies and AS-Levels in unrequired subjects.

The removal of these number caps was made possible because of the changes in the structure of university finance described in Section 1; as the sector is now funded through the repayment of tuition fees by graduates, the government’s financial burden is lower, though it remains significant as a result of loan subsidies. Thus, an outstanding question that remains is how the removal of number controls is to be paid for.

Calls for new entrants

As discussed, the numbers caps reforms were likely part of a move by the Conservative government to bring in more competition into the sector. This was further bolstered with plans to encourage new providers to enter the system, again announced in the higher education white paper. Students at these providers are now be able to borrow up to £6,000 per year for tuition fees and are also be able to access maintenance loans as standard. Moreover, controls have been relaxed to make it easier for new institutions to gain university status. Evidence from other countries (e.g. US and New Zealand) suggests this move is not without its risks and that opening the system up to new providers could result in students enrolling in low value courses which will offer no returns, at significant cost to the individual and the taxpayer.

2.2 Labour market returns to a degree

Expansion of the sector, coupled with the aforementioned moves to introduce new providers has been met with inevitable concerns about declining quality, over-supply of graduates, and a falling wage premium. Commentators argue that the number of graduates has “significantly outstripped” the creation of high-skilled jobs, and that over-qualification is at “saturation point” (The Telegraph, 2015).

The question of whether it is still economically worthwhile for young people to go to university has been asked for many years, dating back to the time of the Robbins Report in 1963, when only 1 in every 100 people went to university. Some 55 years on, the evidence so far suggests that the wage premium for graduates still holds strong. The latest economic research on the financial returns from university education show that earnings for degree holders compared to those with A-levels are between £105,000 and £250,000 over a lifetime (Walker and Zhu, 2013). Recent research shows that the graduate premium has held steady over time (Blundell et al., 2016). If graduate supply has increased, and yet the wage premium is still positive, basic economics tells us that there must be a strong and continuing increased employer demand for graduates. So by this definition at least, there is no evidence to suggest we have too many graduates.¹⁰

However, it is increasingly apparent that there is significant variation in returns, both by university and subject, suggesting that some degrees may be a riskier investment than others. In the UK, Walker and Zhu (2011) have reported evidence of wage differentials varying considerably across different degree subjects. While women enjoy large returns from all subject types, men experience very large returns

¹⁰ While the overall wage premium for graduates has been steady in recent years, there has been a rise in the postgraduate premium (both compared to non-graduates, and also when compared to graduates with only a first degree), see Lindley and Machin (2016).

from law, economics and management degrees, but less so for science, technology, engineering, maths degrees. Meanwhile degrees such as arts, education and humanities attract far lower returns.

Using tax and student loan administrative data Britton et al. (2016) reveal considerable variation in earnings according to subject choice (with economics and law delivering the biggest gains, and arts degrees deliver earnings that are similar to non-graduates). But they also confirm that institution itself matters for earnings, with male and female students studying at more selective UK institutions (e.g. Oxford, Cambridge, LSE) going on to earn considerably more than those studying at less selective institutions.¹¹

The wide variation in earnings of graduates suggests that from an income perspective at least, a university education might not be the best route for all students, compared to vocational and technical education options which government is seeking to strengthen with a series of reforms (though this is against a backdrop of a severe funding squeeze¹²). It is important that potential students have clear and comparable information of the likely returns of different post-school routes open to them in order to make an informed decision about their future.

2.3 Maintaining Teaching Quality

Given expansion and concerns about the variation in labour market outcomes from different universities or courses, universities are under increasing scrutiny to maintain quality. In 2016 the Teaching Excellence Framework (TEF) was introduced, designed to monitor university teaching quality. This would work alongside the Research Excellence Framework (REF), the long-established research quality measure, by measuring teaching quality in the sector. However, measuring teaching quality is notoriously difficult in higher education. Unlike in the schools sector, there are no external leaving exams – rather universities set and mark their own exams – meaning that outcomes are not comparable across institutions, and value added type measures are not meaningful.

The metrics chosen for the initial round of the TEF comprised student satisfaction measures (3 measures, drawn from the National Student Survey), student employment outcomes (2 measures, based on the DLHE destination of leavers in HE data taken 6 months after graduation), and dropout, and in the initial phase, each of 134 higher education institutions, plus three alternative providers were rated either gold, silver or bronze. The results of the initial TEF rating exercise proved controversial. About

¹¹ It is important to note that the design of the government's income contingent loan system insures students against a lack of return. As described in Section 1, students only repay their loan once earning over £25,000 per year. Therefore those studying for degrees with low returns need not be concerned about repayment burden or default.

¹² See CVER (2017) for a response to the government's Industrial Strategy Green Paper proposals on further education. See Belfield et al. (2018) for recent analysis of education spending by sector, showing that spending per student in the FE sector has fallen by 8% in real terms since 2010-11.

a third of the universities received gold ratings – including Oxford, Cambridge and 6 Russell Group institutions. However, of the 67 institutions rated bronze, three universities were from the Russell Group: LSE, Southampton and Liverpool.

Commentators and institutions have argued that the TEF does not really measure teaching quality, and that it contains biases – for example, that students may be incentivised to report favourably in student satisfaction measures to ensure their institution does well in the TEF. If this is the case, it could lead to game playing by institutions rather than improvements in teaching quality. Another important criticism of the TEF is that results are measured at the institution level, so are less informative than desirable, given the student experience is likely to vary within institution (see McCormack et al., 2013, for example, further discussed below).

Perhaps more controversially, the desire to produce a market also led the government to attempt to link universities' ability to raise fees to these metrics. The idea was that those universities who scored gold in the TEF could raise fees by inflation. Those scoring silver or bronze could not. A number of threats to this idea soon emerged, most notably, when the NUS voted to boycott the student satisfaction survey to protest the link with the fee rise. Other institutions participation rates in the NSS were too low to be included.

Eventually, the government suffered a defeat in the Lords who rejected the idea of linking fees to the TEF. Thus, the TEF no longer has a bearing on the amount that university providers can charge and the link between the TEF and higher fees is broken. Moreover, the Lords amendment effectively makes it illegal for the government to use the TEF as a way to set universities ability to recruit international students, another potential future move. While the TEF will still exist as a quality monitor, this again hampers efforts by the Government to inject more competition into the sector.

Another university monitor, the Office for Students (OfS) was established in 2018. This new body is responsible for monitoring access of disadvantaged students to higher education (thus replacing the Office for Fair Access, the previous widening participation watchdog) as well as for monitoring student success in higher education, ensuring high quality advice and guidance to help students choose a university, and ensuring value for money.

2.4 University management and quality

As well as wide variation in returns according to university and subject, studies have also found variation in university management practices, which in turn impacts university quality. A study by McCormack et al. (2013) surveys university management practices in the UK using a survey tool originally developed by Bloom and Van Reenen (2007), to examine the relationship between

management scores and research and teaching performance. It is found that there is wide variation in management practices within universities across departments, with department management scores particularly important for performance. Interestingly, pre-1992 universities were found to be better managed than newer, more teaching-focused departments. Management scores were also found to be positively correlated with externally assessed measures of performance in both research and teaching. Of the different types of management practices, people management and incentives were found to be the most important with respect to explaining differences in performance. It appears therefore that consistent with other sectors where management practices have been measured using similar techniques (manufacturing, retail, hospitals and schools), management matters for performance. More research is needed to understand better the causal factors explaining differences in management practices.

3. THE INTERNATIONAL NATURE OF UK UNIVERSITIES

Recent years have seen increased internationalisation of higher education systems, both in terms of students and staffing. The OECD reports that the number of international students globally has increased from 1.3 million in 1990 to 4.3 million in 2012 (OECD, 2013). Given their high rankings, universities in the UK have been in a prime position to recruit internationally. Furthermore, given that English is the major lingua franca of business and academia, universities in English-speaking countries have a clear advantage in attracting international faculty and students. Thus, the UK ranks second, after Australia, in the percentage of enrolled university students who come from overseas and second, after America, in total numbers enrolled (OECD, 2013, 2015).¹³

Brexit represents a large source of uncertainty to the UK higher education sector, through its likely impacts on both students and staff. And this is against a background of continued globalisation in higher education and increasing competition from elsewhere. While there is no cap on international students, they are currently included in net migration targets. Many competitor countries actually have targets for increasing the numbers of international students, and offer more generous post-study work options.¹⁴ Acknowledging risks in this area, the Home Secretary has signalled that the inclusion of international students in net migration figures would be reviewed. This section outlines the current dependence of the university sector on the EU, and the potential changes and repercussions following Brexit based on the existing literature on higher education systems from around the globe.

¹³ In addition, country market shares of the total number of international students in 2015 were: USA 19%; UK 10%; Australia and France 6%; Germany 5%; Canada and Japan (both 3%) (OECD, 2015).

¹⁴ For a detailed review of the data and trends on international students in the UK, and comparison of relevant UK policies to other competitor countries, see the Migration Advisory Committee report on international students, MAC (2018).

3.1 Likely impacts of Brexit on EU student enrolments

Almost one in five students in the UK higher education system comes from overseas (19%, according to HESA, 2018a), of these 30 per cent are from the EU. Currently, EU students are treated in the same way as UK nationals in terms of tuition fees (£9,250 for undergraduates) and access to government funded student loans. After leaving the EU there is no reason to expect that these students would be charged any less than other international students. Given that the average annual tuition fee for international students is considerably higher (£12,719 for classroom-based degrees, £14,655 for laboratory-based degrees and £24,190 for clinical subjects¹⁵) we should expect that there will be a fall in the number of EU students following Brexit. This is evidenced by the tuition fee increase that occurred in 2012/13, when the fee cap rose from £3,375 to £9,000, which coincided with a 13% drop in the number of EU students (HESA, 2018a). Even though this implies that students are relatively unresponsive to price, with a price elasticity of -0.08 (= -13.2%/166%), this was under a situation where the tuition fees were completely covered by an income contingent loan, and so will be an underestimate of the price elasticity where they face the full cost up front. Therefore, the removal of the financial support combined with the increase in fees would likely lead to an even larger reduction in the number of EU students. This will be mitigated with any further falls in the value of the pound which has made UK courses cheaper.¹⁶

The largest impacts are likely to be felt in postgraduate research courses such as PhDs. One in seven PhD students in the UK are from the rest of the EU (13.3 per cent according to HESA, 2018a). Although these students do not face the same tuition fees as undergraduates, the reduction in financial support, such as access to research council scholarships, will reduce the attractiveness of the UK as a destination for potential doctoral students to complete their PhD.

3.2 Potential costs from having fewer EU students

What are the costs to having fewer EU students in the UK HE sector? A broader discussion about the benefits of international students can be found in Murphy (2014), but the following applies to the situation facing the UK.

¹⁵ Complete University Guide (2015)

¹⁶ In February 2018 UCAS reported record high applications from EU students, which was widely reported as “Brexit has not deterred EU students from studying in the UK”.

<https://www.telegraph.co.uk/news/2018/02/05/eu-applicants-rise-100000-foreign-students-apply-uk-universities/>. However the UK is still currently an EU member and the increased applications this year may reflect EU students making the most of the current financial arrangements before the UK leaves. Government has committed to keeping fees and financial support for EU students the same as UK students for those starting courses in autumn 2019.

Academically, the most immediate consequence from a fall in demand will either be a reduction in tuition fee income (therefore less resource to be spent on students) or a reduction in the quality of students admitted to courses (in order to fill the spare capacity). Domestic students may also suffer from not having EU students in the lecture hall as they may have been exerting a positive peer effects if international students are of higher ability or exert more effort. A less tangible benefit for the domestic student body is that it gives them the opportunity to learn about diversity and develop a better “world view”. Finally, attracting international postgraduate students allows for the production of more research, further improving an institution’s reputation domestically and abroad. This also has potential benefits for the domestic economy through increased and higher quality R&D and innovation.

EU students (like international students in general) also generate other non-academic benefits for the domestic economy. First, international students are an important export market (estimated at £17.6 billion in 2015 by the Department for Education) and spend money in the UK on living expenses and via friends and family visiting them (in addition to their tuition fees). Second, once students complete their studies many stay in the country: Felbermayr and Reczkowski (2014) found a retention rate of around 70 per cent in Anglo-Saxon countries. Kelly and McNicoll (2009) estimate that those who remain contribute fiscally £100 million per year to the UK economy. They tend to be valued in the labour market: analysis by the Department for Education finds that the median earnings of overseas undergraduate students are higher than UK student earnings once they enter work; and for postgraduates (Masters, PhDs, MBAs), median EU students earn more than non-EU students.¹⁷ The economics literature has also linked overseas students to entrepreneurship. Hunt (2011) showed that immigrants to the US who entered on a student/trainee visa or a temporary work visa have a large advantage over natives in wages, patenting, and publishing. In contrast immigrants who entered with legal permanent residence do not outperform natives for any of the outcomes considered. Using data on UK enrolments and firms, Valero (2018) also finds that increases in overseas students are linked to increased start-up activity in the local areas surrounding universities. Finally, there is the potential benefit that international students who return to their home countries are more likely to consume goods and services from companies they became acquainted with in their time studying in the United Kingdom (Blaug 1981; Bartlett et al. 1981).

There might also be potential benefits in reducing the number of EU students for UK students. Along with the positive peer effects described above, there is also the potential for negative peer effects: if international students are not well prepared for the course either through language barriers or prior learning this may hamper the learning process of the domestic students.¹⁸ In addition, reducing the

¹⁷ DfE Graduate outcomes (LEO), as summarised in MAC (2018).

¹⁸ Surveys suggest that overall the impacts of overseas students on domestic students learning experiences are positive, though some students (around 20 per cent) have expressed concern about language issues slowing down the class (see summary of such surveys in chapter 5 of MAC, 2018).

number of EU students will reduce the competition for graduate jobs for domestic students. However, this is not a benefit for the UK economy as a whole if this implies that graduates are of lower quality on average. Finally, reducing the numbers of EU students would mean a reduction in the flow of domestic technologies abroad along with them, which would improve the UK's relative advantage in research.

Machin and Murphy (2017) show that increasing the number of non-EU international postgraduate students increased the number of domestic students enrolled at the same institution and subject area. This implies that international students are not crowding out domestic students and are in fact subsidising more posts for domestic postgraduates. This was during a period when there was caps on the number of domestic undergraduates, which meant there was no possibility for this to occur for undergraduates. Moreover, because EU students were required to be treated the same as UK nationals, this meant that EU undergraduates crowded out domestic undergraduates on a one-to-one basis. However since the end of the cap on student numbers this no-longer holds. As Brexit would cause non-UK EU students to be treated in the same way as other international students, this leaves the possibility of subsidisation, but this would require an increase in the number of EU students attending UK institutions.

In summary leaving the EU will likely reduce the numbers of non-UK EU students enrolling at UK higher education institutions, given their revealed price sensitivity. Universities could make up for this reduction in demand by either enrolling more domestic students (at the cost of lowering entry standards) or by taking on more international students. The latter option will depend on the government removing foreign students from immigration targets, a policy advocated by university vice-chancellors and some MPs.

3.3 Impacts on academics

In addition to the impact on student demand is the effect that Brexit may have on staff in higher education institutions. Currently 17.3% of the academic staff in UK HE institutions are from the EU (HESA, 2018b). This proportion is almost three times greater than in the country as a whole, where only 6% of working age population are from the EU (Wadsworth, 2017). The post-Brexit rights of EU citizens, including university employees, are unclear. This uncertainty has led many to believe that there will be difficulties in the recruitment and retention of EU faculty. Currently a third of new recruits are from overseas (including non-EU) (HESA, 2016; HESA, 2017). This rate has held up for the most recent data available for December 2016 (HESA, 2018b), which relates to after the referendum. However, many full time academic employment contracts would have been signed before the referendum in June that year, therefore we may have to wait another year or two before drawing any firm conclusions. As well as recruitment issues, Brexit may also cause difficulties retaining academics

in the UK. According to a Freedom of Information replies from 105 UK HEIs, there has been a 19% increase in resignations of EU faculty since 2015. In the last year almost 2,350 academics from the EU have resigned from UK universities, compared to 1,938 in the previous year and 1,975 two years ago (Liberal Democrats, 2018). Moreover, the universities with the largest contingent of EU faculty are amongst the UK's leading research institutions, Oxford (1702), Cambridge (1662) and King's College London (1558).

Reducing the demand for faculty jobs in the UK has very similar set of consequences as previously outlined for students. Previously EU staff faced no barriers to employment, now these academics may start to look elsewhere, potentially threatening university quality. Universities have the option of employing more domestic faculty at the cost of a reduction in quality (if they were higher quality then they would have been hired regardless), or taking on more international faculty. However, this latter option will again depend on the government removing foreign faculty from immigration targets.

Another important issue is preserving the amount of funding and collaboration opportunities available to faculty. The EU allocated £725m in research grants to UK higher education institutions in 2014/15 according to HESA (Royal Society, 2017). This represents 12 per cent of total research income from grants and contracts (£5.9bn) and 25% of the £2.75bn in research grants provided by UK government bodies (Royal Society, 2017). Therefore, leaving the EU will cause a significant loss in research funds unless the difference is matched by the UK government. However matching the funding may not be sufficient, as the pool of potential collaborators on a research project may become more limited depending on the funding arrangements. Turning to a national funding system means that large international research collaborations will become infeasible under current funding structures. Given the highly specialised nature of research today, with only handfuls of experts in a specific field globally, it is critical that UK academics can easily collaborate with researchers abroad.

3.4 Maintaining an internationally open university system

Research has shown that high quality students and researchers from abroad can not only contribute to the economy directly, but international students also increase resources available for domestic students and overall have a positive impact on their learning experiences. Restricting entry of these highly qualified individuals to the UK not only means a reduction in spending in the economy and at universities but means the economy will not be gaining from their human capital. The sending countries will have invested considerable sums into the human capital of these individuals which the UK would then be gaining from. It is therefore essential that leading universities are able to continue to recruit international talent (as faculty, research staff and students). This would not only mean a lack of

restrictions on their numbers entering into the country, but also that the UK is seen to be welcoming.¹⁹ Moreover, the largest potential gains are from retaining the graduates in the UK so that the economy can gain from their education. Therefore, allowing highly skilled graduates to seek and gain employment after graduation would be a major boon to the economy. Ultimately the impact of Brexit and wider reforms of the immigration system on the HE sector will depend directly on government policy. Will students and faculty count towards immigration targets? Will there be continued financial support for EU students? Will EU research funding be matched? Will international collaborations be fostered? The answers to each of these questions will have large impacts on the productivity and efficiency of the sector and the wider economy.

4. UNIVERSITIES AND THEIR LOCAL ECONOMIES

As key producers of human capital and innovation, universities have had an important role in national and regional growth strategies worldwide. Since the 1990s, there has been increased focus also on the so-called “third mission” of universities, giving them an explicit role in socio-economic development. Accordingly, the Industrial Strategy highlights the role of universities in its vision for a “knowledge-led” economy: “‘Innovation clusters’ will form and grow around our universities and research organisations, bringing together world-class research, business expertise and entrepreneurial drive” (HMG, 2017).

In addition to the substantial productivity gap that exists in aggregate between the UK and its main international peers, there are also large disparities in business activity and performance across the UK (see, for example, Bernick et al., 2017). Analysis of industrial specialisation reveals the uneven spread of high-tech sectors which are seen as important for future growth in advanced economies. Such sectors tend to benefit from the network effects of firms and researchers clustering together, which has a positive impact on local economies. Well known and often cited examples of high-tech clusters include Silicon Valley in the US and the Cambridge cluster in the UK.

However, a key challenge lies in determining the extent to which university activity causes economic success. It might be that there are other common factors which drive the growth of local economies and the university sector, or there might also be feedback effects from industry to university activity. The overall economic impact of universities is examined by Valero and Van Reenen (2018) using international data from the 1960s to today, who find that a 10% increase in the number of universities in a region is robustly associated with a 0.4% increase in regional GDP, even after controlling for

¹⁹ The MAC (2018) report summarises findings from a survey of international students which finds that when deciding where to study, the most important factors are the quality of the teaching and a welcoming environment, while migration policies also play a key role. It also reports another survey of students that considered the UK and chose to go elsewhere, the most important factor in such cases was post-study work options.

country and time effects, population growth and regional trends. Focusing on the UK, Valero (2018) finds that growth in universities (in terms of their size) generates start-up activity in their nearby areas, including in the innovative high-tech sectors. University growth also raises productivity in areas with a larger high-tech sector, and in general, the impacts are larger for universities of higher quality and research intensity. In the next sections we outline what is known about the various mechanisms via which universities can affect their local economies, and what this implies for policy.

4.1 Universities and human capital

There is an established literature in economics that links human capital to regional economic growth and beyond the direct impact due to the fact that on average skilled workers are more productive than unskilled workers, there also appear to be indirect spillover effects (see for example, Moretti, 2004a and Moretti, 2004b). In the UK and elsewhere, a large fraction of graduates remain in the region where they studied and therefore universities can make an important contribution to the local skills base. Across local enterprise partnerships (LEP), 38.1% of UK domiciled students stay in the same LEP as that in which they studied.²⁰ In addition, the economics literature has found that proximity increases the probability that locally born young people go to university (e.g. Card, 2001). In the UK, on average 34.5% of students go to university in the LEP where they grew up. Therefore, in the case of the UK it is reasonable to assume that universities increase local human capital in the workforce both by training students from the local area, and by pulling students into a region from elsewhere. In Section 3 we discuss how universities also attract skilled students and researchers from abroad.

The evidence suggests that expansion of the university sector will continue to have positive effects on local economies, assuming that quality is maintained. This caveat is important. With respect to the role of universities in generating human capital, we saw in Section 2 that while many university degrees provide skills which are highly valued in the labour market, there is significant variation across courses and institutions (Britton et al., 2016). Employers consistently report skills gaps in areas such as STEM and languages, but also complain that some graduates lack basic professional skills. While there are non-economic motivations for individuals or society in pursuing particular courses of study, from a growth perspective it is important the supply of graduates is effectively matched with current and anticipated future demand. To date, little is known about the causal impacts of policies designed to stimulate co-operation between universities and firms to meet skill needs. This is likely to become all the more important due to new skill demands arising from technological change as the fourth industrial revolution combines with the transition to a low-carbon economy. There is likely to be an increased need for re-skilling and up-skilling the workforce through life-long learning. Universities, together with

²⁰ Data from HEFCE, Geographical Mobility of Students, based on first degree students who studied in higher education in the years 2010-11 or 2014-15 inclusive. Data based on employment destinations six months after graduation.

further education colleges will have an important role to play here, and this is likely to imply the provision of more broad-based education, for students at different life-stages (Haldane, 2018a).

Finally, as discussed in Section 3, to ensure that firms in the UK continue to benefit from international talent it is important that its attractiveness is maintained for students and researchers from overseas.

4.2 Universities and innovation

University research produces innovation which is key to long-run growth, and also creates ‘spillover effects’ for local firms. Universities can create innovation spillovers via formal or informal interactions between university research and businesses, and the innovative activities of staff, students and graduates. Stemming from the seminal paper by Jaffe (1989), a number of subsequent papers (mainly based on US data) have found strong evidence of localised innovation spillovers from university research. Some papers then relate increases in innovation to local economic outcomes using exogenous sources of variation to estimate a causal relationship (see for example Hausman, 2017 or Kantor and Whalley, 2014) finding that economic spillovers are larger for sectors that are technologically closer to the university’s specialisms. There are also papers that focus on the extent to which university research activity stimulates start-ups (for example, Woodward et al. (2006) who focus on science and engineering research and high-tech start-ups in the US, finding small positive effects).

It does not necessarily follow that these findings from the US will translate to the UK. It is well-known that the UK “punches above its weight” in terms of the quality of its research, but also that the commercialisation of research could be improved (see for example, the Dowling Review, 2015). Empirical studies on the relationships between UK universities and innovation to date tend to focus on the effects of university research on the extent and location of business research and innovation. Again, these studies find that effects are highly localised and exist for specific sectors. For example, Helmers and Rogers (2015) consider the manufacturing sector and shows a positive relationship between university research and the patenting of small firms located near to universities (but has no relationship for large firms), and that the quality of university research matters. Studying where firms locate their R&D across eight product groups, Abramovsky and Simpson (2011) find that pharmaceuticals sector firms are more likely to co-locate near universities, but there is little evidence of co-location in other sectors. Papers that analyse the effect of university research activity on area or firm performance include Guerrero et al. (2015), who find positive relationships between university teaching, research and spin-offs and the productivity of UK regions (at the NUTS3 level) and Harris et al. (2011) who find a positive relationship between university-firm research collaboration and TFP.

A number of mechanisms, institutions and government schemes in the UK seek to support collaboration, knowledge exchange and technology transfer between universities and industry, including the Catapult

network (technology institutes that connect academic researchers with business²¹), the Higher Education Innovation Fund (HEIF) to support university knowledge exchange, the piloted “University Enterprise Zones” scheme and university patient capital funds, incubators and science parks. Evaluations, where available, suggest such schemes such as HEIF are having positive economic impacts.²² There is also some evidence that university involvement in incubator schemes improves outcomes for firms (for a summary, see Madaleno et al., 2018). In addition, assessments of research quality are placing increased emphasis on impact. The most recent Research Excellence Framework (REF 2014), was the first to assess impact outside of academia, defined as “an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia”. Following the recommendations of the Stern review in 2016, impact will be given increased weight in REF 2021. Also in development is a new “Knowledge Exchange Framework” to benchmark universities’ performance at knowledge exchange and commercialisation.

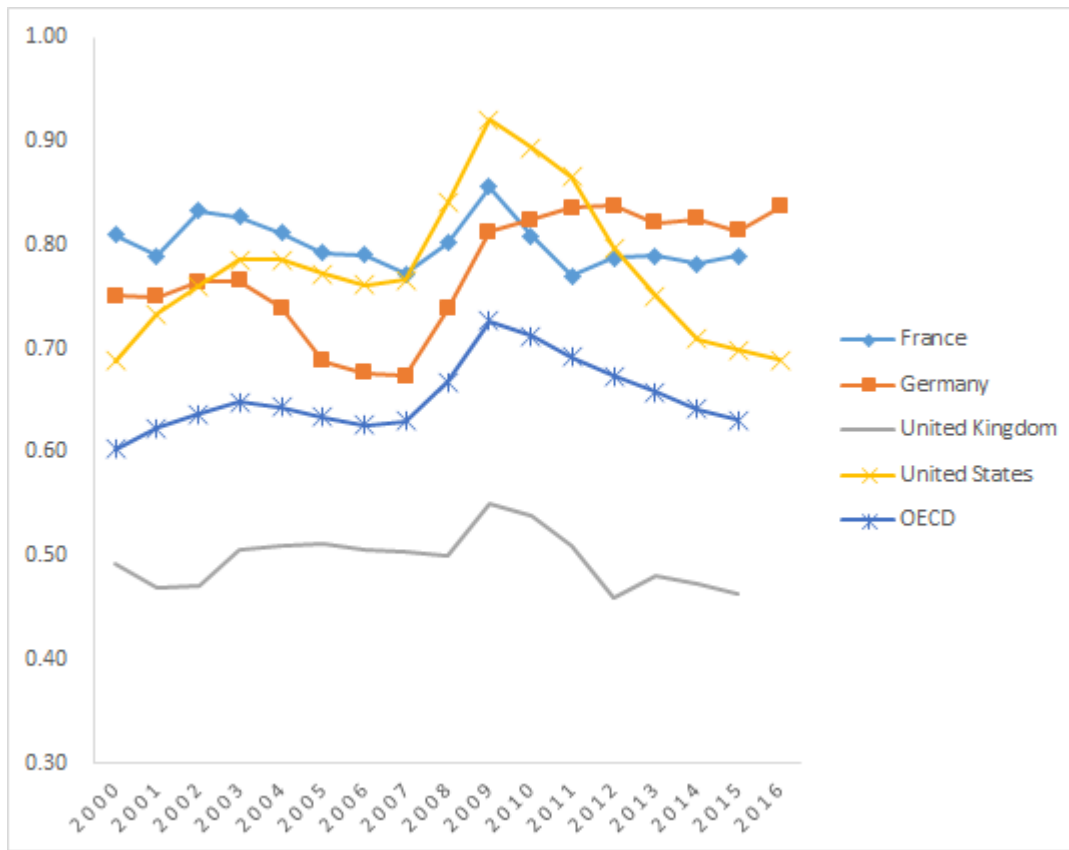
Government recently pledged to raise publicly financed R&D over the coming years (this has lagged other advanced economies as a share of GDP for some time, see Figure 4.1). In general, the evidence suggests that higher quality institutions tend to have a greater economic impact, which supports the government approach of channelling such funding towards centres of excellence. But given the focus on “place” in the industrial strategy, it might also be valuable to build excellence in areas with the industrial potential to benefit from it. The government’s science and innovation audits²³ could be a good mechanism for finding out where this could be so identifying areas with underlying strengths which could be built upon.

²¹ These are modelled on the German Fraunhofer institutes, though to date there are only 10 of these in the UK (compared to over 70 in Germany); they are smaller scale than their German counterparts, and their focus to date has been mainly on acting as hubs for innovation (rather than diffusion, which is also important for raising productivity in the UK, see discussion in the next section).

²² See for example, Coates Ulrichsen (2015) on HEIF. Vanino et al. (2017) assess the effects on firm performance of receiving government funded R&D grants over the period 2004-2016 finding positive effects on firm growth, which are stronger in high-tech firms.

²³ These bring together local consortia of business, universities, research and innovation organizations and LEPs to examine key science and innovation strengths in their regions to provide evidence of their potential to build and develop world-leading products, services and technologies. See: <https://www.gov.uk/government/publications/science-and-innovation-audits-second-reports-published>

Figure 4.1: Government Financed R&D as a Share of GDP



Notes: Government financed GERD (Gross Expenditure on R&D) as a percentage of GDP, sourced from OECD MSTI.

Relatedly, government support for research in particular technologies is often channelled towards areas of UK comparative advantage. Recent research based on patent citations (Dechezleprêtre et al., 2017) suggests that another relevant metric is the extent of spillovers generated by innovation in specific areas. This analysis has also shown that “green” technologies generate greater spillovers than more “dirty” technologies. In the context of the industrial strategy’s grand challenge of “clean growth”, and the need to upgrade the UK’s infrastructure at all levels (LSE Growth Commission, 2013), these findings provide further justification for funding research into technologies and systems that will allow the UK to meet decarbonisation targets and follow a sustainable growth path into the future. From a UK industrial strategy perspective, it is also relevant to consider the extent to which such spillovers are felt in the UK versus overseas, and the extent to which there are regional patterns in spillovers.

It has been highlighted that in addition to focusing on the supply side (universities), through for example, strengthening technology transfer and other mechanisms, it is also important to increase business demand for R&D and collaboration (House of Commons, 2017). Business R&D as a share of GDP also lags our main comparator countries, hovering around 1% of GDP since 2000, while Germany

and the US are closer to 2%, France 1.4% and the OECD average is 1.6%). R&D tax credits are an effective lever, particularly for smaller firms (Dechezleprêtre et al. 2016) and there might be scope for providing explicit support for business-university research collaboration within the R&D tax credit system. Moreover, difficulties accessing finance are a key barrier to the commercialisation of innovation in the UK (LSE Growth Commission, 2013) and more can be done to promote alternative sources of finance for UK firms, in particular SMEs with high growth potential.

4.3 Universities and other forms of business support

Over and above the human capital and innovation channels, universities might impact upon local areas through other interactions with business and the community, which may include consultancy, sharing of facilities and or working with local policymakers.²⁴ Indeed, the KEF is intended to cover such activities, in addition to the traditional technology transfer discussed in the last section.

There is a “long tail” of unproductive small businesses in the UK, for which the diffusion of existing technologies or organisational practices is more important than generating frontier innovation. UK firms on average have lower management scores (Bloom and Van Reenen, 2007) than the US and Germany, and tend to have lower adoption rates of key technologies than OECD counterparts. Using their expertise and convening power, universities can and do help address these problems, providing SMEs with advice and support. A commonly held view, however, is that universities could do more of this type of activity.²⁵ Moreover, there is little evidence on the causal impacts of university business support activities where they do occur. New schemes and policies, particularly those involving government support, should be designed with evaluation in mind.

In a recent speech, Andy Haldane, Chief Economist of the Bank of England outlines a vision whereby the small set of high quality universities which currently act as “innovation hubs” could be accompanied by “diffusion spokes” (Haldane, 2018b). He argues that the UK’s other universities, as existing institutions with the relevant expertise and broad regional and sectoral reach, would be well placed to perform this function. This links to a broader point about universities and the institutional landscape. Across all these areas, there is need for universities need to work effectively with city and regional leaders and local enterprise partnerships (LEPs) to design tailored strategies building on local strengths – or addressing local gaps in skills, innovation or other areas relevant for business. While LEPs have a remit to support local innovation, their relationship with universities has been patchy (House of Commons, 2017). In addition, there have been concerns that LEPs lack sufficient resource, and the

²⁴ For more details of the different types of activity in which UK universities engage, see the Higher Education – Business and Community Interaction Survey (2015-2016).

²⁵ See, for example, discussion on universities in the North East, at <https://www.universitiesuk.ac.uk/blog/Pages/How-can-universities-better-support-local-and-regional-businesses.aspx>

incentives to invest in projects for long-term development.²⁶ Moreover, there are concerns of capture by large businesses (FSB, 2014). The current pilot of four ‘university enterprise zones’ seeks to strengthen these interactions, but the future of this scheme is unclear. For the government’s new industrial strategy to have a long-term impact, the institutional framework should be clearly defined, joined up across levels of government (including with the Local Industrial Strategies) and stable over time.

Conclusions

Universities are key institutions that can help the UK to move onto a sustainable and inclusive growth path, with important roles across all the foundations set out in the government’s industrial strategy: people, place, ideas, business environment and infrastructure.

Inclusive growth requires university education to be accessible to students from different backgrounds. There is still a gap between admissions of disadvantaged students and their advantaged peers, particularly in the most selective universities. Much of this gap is driven by prior attainment, and it is crucial to improve the outcomes of disadvantaged children in schools. However, the gap remains even when conditioning on prior attainment and the HE system itself can do more to improve accessibility. Providing customised information, advice and guidance at critical stages can help students to make better choices, and increased transparency could also help level the playing field. So far, the evidence suggests that enrolments from disadvantaged students have not suffered from the introduction of fees, due to the accompanying loans and maintenance support. However, the conversion of maintenance grants to loans could harm university admissions from disadvantaged students and it is therefore important to consider how to mitigate these effects.

University graduates still enjoy a degree premium relative to non-graduates despite sustained expansion in the sector over recent years, but there is wide variation in these returns across universities and course types. This suggests that from an earnings perspective at least, a university education might not be the best route for all students, compared to vocational and technical education options. It is important that potential students have clear and comparable information of the likely returns of different post-school routes open to them in order to make an informed decision about their future. Looking forwards, over and above their role in the education of school-leavers, and in response to technological change, universities (and further education colleges) will have an important role to play in re-skilling and up-skilling the workforce through life-long learning.

²⁶ See NAO (2016).

Universities are key component of the UK's innovation infrastructure and increasing funding for basic research is welcome, but more can be done to improve the commercialisation of basic research so that inventions translate into marketable products or services and this includes measures to increase the demand for business R&D. In addition to generating and growing innovation hubs that boost firms at the technological frontier, universities can also play more of a role in the diffusion of existing technologies, thereby increasing the productivity of lagging firms. In general, with these types of policies, more causal evidence of what works is required.

Against a background of globalisation in higher education and increasing competition from elsewhere, Brexit represents a large source of uncertainty, through its likely impacts on the numbers and average quality of both students and staff. As the UK redefines its relationship with the EU and the rest of the world, it is essential that its universities continue to attract high quality international students, staff and research collaborations.

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