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THE HIGHER EDUCATION AND RESEARCH SYSTEM IN ENGLAND

A COUNTRY PROFILE FOR AWTI



The Advisory council for science, technology and innovation (AWTI) has commissioned this report as a background study for the AWTI advisory report *Het stelsel op scherp gezet. Naar toekomstbestendig hoger onderwijs en onderzoek* ('Shaking up the system. Towards a future-proof higher education and research system'). This background study has been carried out by Technopolis Group. This publication and AWTI's advisory report may be found at www.awti.nl.

The Advisory council for science, technology and innovation (AWTI) advises the Dutch government and parliament on policy in the areas of scientific research, technological development and innovation. The AWTI provides advice when it is applied for or when the council deems it necessary. It enjoys an independent position towards the Ministers and their Departments, as well as towards other parties involved. The advisory council consists of a maximum of 10 members, each originating from different sectors of society, such as research institutes and trade and industry. The members do not represent any special interests.

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The Higher Education and Research System in England

A Country Profile for AWTI

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Table of Contents

1	Introduction.....	1
2	Higher education landscape in England	1
2.1	Types of higher education qualifications	1
2.2	Types of higher education providers.....	1
2.3	Mission groups of universities.....	3
2.4	Competition in higher education market in England.....	4
2.5	The Teaching Excellence Framework	5
2.6	Review of Post-18 education.....	6
3	Access to higher education in England	6
3.1	Widening participation in higher education.....	6
3.2	Mobility across different higher education providers	7
4	Financing of higher education in England.....	8
4.1	Governmental financing	8
4.2	Private financing	9
5	Research system in England.....	10
5.1	Research funding in England	10
5.2	The Research Excellence Framework (REF)	11
5.3	Full economic costing of research	12
5.4	Interlink between education and research	13
6	Internationalisation of higher education in England.....	13
6.1	Importance of international students for higher education in England.....	13
6.2	Propensity of UK students to study abroad	14
7	Linkages between higher education and the labour market in England.....	15
7.1	Graduate employment	15
7.2	Demand for graduate skills in the labour market.....	15
7.3	Evidence of graduate skill mismatch and gaps.....	16
7.4	Graduate employment and skills mismatch monitoring surveys	17
8	Interviewees.....	18
9	Bibliography	18
	Appendix A Figures and tables.....	23

Tables

Table 1 - Main performance based research assessment policy objectives in comparator countries	24
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Figures

Figure 1 - Higher education qualifications in England 1

Figure 2 New provider application process23

Figure 3 - The UK Higher Education Initial Participation Rate (HEIPR) from 2006/07 to 2015/1623

Figure 4 - Composition of HEFCE/OfS Institutional Funding for research, 2015/624

Figure 5 - Sources of income for R&D expenditure at UK HEIs 2016/1724

Figure 6 - Higher Education Expenditure on R&D as a Percentage of GDP 1981-2014.....25

Figure 7 - Composition of the HEFCE/OfS grant 2017/1825

Figure 8 - Trends in mean citation rates, 1990-2011 for fifteen of the currently most highly cited countries.....26

Figure 9 - Shares of internationally collaborative / domestically produced UK scientific publications over time...26

Figure 10 - Density of skill-shortage vacancies (SSVs) by sector and occupation within sector (UK, 2015).....27

1 Introduction

This country profile forms part of a deliverable package to the Advisory Council for Science, Technology and Innovation (AWTI) in the Netherlands and covers England’s higher education system.

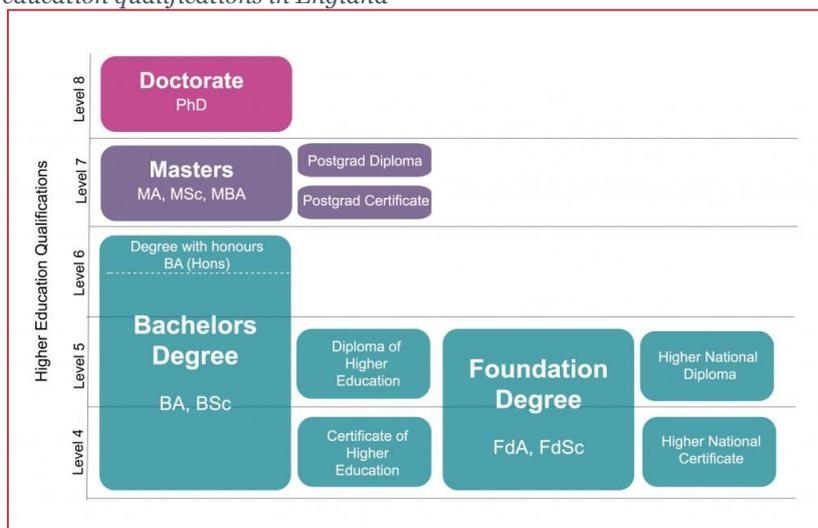
The main research methods include literature review and secondary data analysis undertaken by means of desk research, and a set of face-to-face and phone interviews conducted as part of primary research (Full list in Section o).

2 Higher education landscape in England

2.1 Types of higher education qualifications

The English Higher Education (HE) landscape is very diverse. It has gone, like many OECD countries, through dramatic changes over the last several decades, moving from an elite system, to a mass system of universal provision. Most HE students are on full-taught degree (bachelors, masters, PhD) courses in universities and this accounts for 1.9 million students enrolled in England in 2017. (Higher Education Statistics Agency, 2018). However, the accepted definition of HE is all taught education above A-level and its equivalents, which means that HE also includes other courses, such as Higher National Certificates (HNC), Higher National Diplomas (HND)¹, foundation degrees² and others. The figure below provides an overview of the HE qualifications in England.

Figure 1 - Higher education qualifications in England



Source: University of Essex

Looking internationally, a much higher proportion of young people expect to graduate with a bachelors degree in England, compared with other advanced countries, while the take up of other forms of HE provision (e.g. HNC and HND in the England’s context) remains below the OECD average.

2.2 Types of higher education providers

There are three types of HE providers in England: Universities, Further education colleges (FECs) and “Alternative” providers. There are 108 universities in England, and they include some of the oldest

¹ An HND is equivalent to the second year of a Bachelors degree. It takes two years of full-time study to complete, or three to four part time, and is designed to equip students with skills relevant to their chosen career.

² A foundation degree offers a combination of workplace learning and academic study. It carries the same weight as two-thirds of a Bachelors degree.

English-speaking universities in the world. The first records of teaching at the University of Oxford date back to 1096, and the University of Cambridge, 1209. The HE sector in England has expanded several times in its history:

- In the 19th century, King's College London and University College London and many of the so-called "redbrick" universities³ were established
- In the 1950s and 1960s, a number of technology-focused institutions were awarded university status (e.g. City, University of London, the University of Bath), followed by more new universities, such as the University of Sussex, the University of York, the University of Essex and the University of Warwick.
- In 1992, the new Further and Higher Education Act awarded university status to 35 former polytechnics⁴ and to other institutions, which meant the end of polytechnics in England (although some of the former polytechnics still build on their traditionally strong "pre-1992" areas).
- The new millennium saw foundation of several tens of new universities, often transformed from vocational education institutions.

The expansions have not led to an increase in homogeneity in offer, or quality, in England and there remain considerable gaps between the leading universities and the rest of the sector. England's research focused universities are prestigious and of excellent quality globally. This group includes some 20 leading universities and they are generally comprehensive in terms of disciplines. Specialised universities (with the exception of colleges of music and arts) have never had a strong position in England, nor globally. The legacy of polytechnics is still significant in England. There is still a perception that the successors of polytechnics remain like the former polytechnics and are thus of a lower calibre. This is very difficult to change. In addition, the market of high-quality universities is well saturated in England. As a result, it is difficult for ex-polytechnics to "upgrade" to a higher level as the only model to aspire to is of a generalist high-research high-tuition fee income through prestige model (i.e. Cambridge and Oxford). This means that England is generally underpowered in supplying more specific technical training at HE level compared to Switzerland and the Netherlands. This may lead to the general HE skills gap going into professions such as engineering.

In addition to universities, there are 240 Further Education Colleges (FECs) or sixth-form colleges that provide HE. FECs account for approximately 9% of all HE students in England (Callender, 2017). Most of these students are registered on undergraduate courses other than Bachelor's degrees, such as Foundation Degrees, HNDs and HNCs. In 2016/2017, this accounted for more than three-quarters of all undergraduate students taught at FECs. Although many FECs are part of the HE system, they have only limited powers in terms of what HE qualifications they can offer. Currently only nine FECs in England have degree-awarding powers, of which seven could award Foundation Degrees and only two could award full-taught degrees (i.e. Bachelors). However, reports show, e.g. Kumari (2017), that many FECs' HE courses are attractive to learners from lower participatory backgrounds, as well as for students who want greater flexibility, because they offer the ability to break down their HE studies into smaller qualifications, offering yearly certificates on the way.

Furthermore, HE is also offered by alternative providers. An alternative provider is defined as any provider of HE courses which does not directly receive annual funding from the Higher Education Funding Council for England (HEFCE, now the Office for Students (OfS)), does not receive direct annual public funding and is not a FEC (HEFCE, 2017). Seven alternative providers have degree-awarding powers, while the rest offer qualifications validated by other organisations such as universities or awarding bodies. The alternative providers are smaller, compared with universities. As of November 2017, there were 114 alternative providers in England (Amyas, 2017).

³ Examples of redbricks include: the University of Birmingham, the University of Bristol, the University of Leeds, the University of Liverpool, the University of Manchester and the University of Sheffield

⁴ Polytechnics were tertiary education teaching institutions offering higher diplomas, undergraduate and post graduate education that were governed and administered at the national level. The focus of Polytechnics was on STEM subjects with a special emphasis on engineering.

There are several ‘gateways’ for a new university entering the HE regulatory framework in England, specifically by gaining degree awarding powers, and by gaining HEFCE/OfS funding for teaching and research. Historically, universities and colleges were given their degree awarding powers by Royal Charter or Act of Parliament (both granted in perpetuity). More recently, the Privy Council grants these powers in perpetuity, if the provider is receiving HEFCE/OfS funding, or, if not, for a fixed term of six years, after which the provider needs to re-apply (HEFCE, 2017). Providers may use the “university” name through Royal Charter, an Act of Parliament, the Further and Higher Education Act 1992 and under the provisions of the Companies Act 2006. Providers must meet certain requirements to receive HEFCE/OfS funding outlined in the Memorandum of Assurance and Accountability (HEFCE, 2014), which includes basic principles of using the money only for its intended purpose and agreeing to provide auditing information. Providers must also apply to the Department for Education through HEFCE/OfS to enable their students to access loans (outlined in Figure 2 in the Appendix).

It usually takes around six years for a provider to become a “university”, during which time they often struggle for funding, one example being the New College of the Humanities who had issues in attracting investors (Viña, 2016). The gateways for FECs providing HE are different in that they can provide HE without having HEFCE/OfS funding because they are already regulated by the further education sector body, although they can apply for it if they wish in much the same way. If they wish to award degrees or use the university title, they must apply, as already mentioned. It can be more difficult for FECs to do this given the processes and governance infrastructure required to meet the standards required.

2.3 Mission groups of universities

England’s HE institutions (but also including universities in Scotland, Wales and Northern Ireland) are traditionally divided into several clubs, or mission groups, based on their origins, ethos and ambitions. The most significant of which is the Russell Group.

Russell Group – A representation of 24 UK universities (The Russell Group of Universities, 2017) that are generally research-intensive, often ranking high in university league tables, and include, for example, the “golden triangle” of the University of Oxford, the University of Cambridge and some parts of the University of London, such as University College London, Imperial College London and King’s College London. Around 27% of all students in England attend Russell Group universities (HESA data 2016/17⁵). In terms of widening access, a number of the Russell Group members show lower percentages of students from state schools, for example in 2016/2017, only 57.7% of UK-domiciled full-time undergraduate entrants to the University of Oxford were from state schools or colleges (62.6% to the University of Cambridge), compared to the England’s average of 90% (Higher Education Statistics Agency, 2018). The Russell Group members also tend to have significantly higher entry requirements than many other universities.

Four of the top ten universities in the world are Russell Group institutions. Furthermore, 15 Russell Group universities feature in the top 100 and all 24 are in the top 250, according to the QS World University Rankings for 2018. The Russell Group universities teach on average over 25,000 students compared to an average of 12,000 at non-Russell Group universities in the UK. The average number of staff employed is 7,100 compared to a non-Russell Group average of 1,700. The ratio of students to academic staff is around 7:1 at Russell Group universities compared to 14:1 at non-Russell Group universities. The Group established a professional, incorporated organisation in 2007 to provide strategy, policy development, intelligence, communications and advocacy for their member institutions, regularly producing evaluation reports on the impact of the universities.

The other university mission groups are:

- **The 1994 Group** – This group existed from 1994 to 2013 and represented mostly small research-intensive universities to defend its members’ interests following the creation of the Russell Group. Their aims were essentially identical to the Russell Group in that they wished to maximise research excellence, funding and reputation for their members.

⁵ HE student enrolments by HE provider and domicile 2016/17

- **The Million+ Group** – Created in 1997, the Million+ group represents 20 HE institutions with approximately 45.2% of the total UK student population (MillionPlus, 2018). Its members are usually universities established after 1992 in big cities. They focus on the quality of HE in the UK and how it can benefit the national interest, in this way they are less focused on research reputation and international esteem. The group’s advocacy body commission and publish evidence and research to inform higher education policy and support good decision making. They also hold colloquiums and networks for policy makers and their members to better influence national policy on HE.
- **The University Alliance** – Formed in 2006, the University Alliance has 18 members, often technical and professional universities. The focus of the Group discussion concentrates on emerging issues in HE for example to changes in the REF methodology and teaching funding. Their members educate 41% of the UK’s part-time students. They focus much more on technical education and applied research compared to the other groups. One of their main goals is the employability of their students and the aim of ensuring they address the UK’s skills gaps in industry. Much of their research is world class yet they focus a lot more on local development and partnerships with local authorities than the other groups.

Many HE institutions are not members of any of these groups. However, on top of the four groups, there are two officially recognised representative bodies for HE in the UK: Universities UK and GuildHE.

- **Universities UK** – This is a representative body of 136 universities in England, Scotland, Wales and Northern Ireland with a core aim to maximise the positive impact for students and the public. The body acts on behalf of its members towards the government and the Parliament, but also abroad.
- **GuildHE** – This group represents specialised HE institutions, such as colleges of arts and music. It was formed in 1967 and has a membership of 49 universities and FECs.

2.4 Competition in higher education market in England

The complicated nature of HE makes it more difficult to allow for efficient competition in a market. There is no meaningful price competition in the English HE system. The UK government introduced tuition fees in England in 1998 and expected that price competition would mean that an average level of tuition fees across England would be lower than the maximum cap (currently at £9,250). However, the real student behaviour showed that HE is a product where price is often equated with quality (a phenomenon known in economic theory as Veblen goods). As a result, HE providers are incentivised to charge the maximum tuition fees, even those of lower reputation and/or for courses that cost less, because lower price could pose a risk to the reputation (and could suggest poor quality and reduce demand instead) (Amyas, 2017). Most FECs and all ‘alternative providers’ cannot charge above £6,000 and those with an OFFA/OfS access agreement tend not to charge more than £7,500, though this part of the sector does not compete in a meaningful way with the university sector due to prestige reasons.

Russell Group graduates earn on average around 10% more than graduates of other universities over a lifetime (Russell Group, 2017). There are no significant differences in teaching costs for Russell Groups compared to other providers, although they do offer more high cost programmes because of their medical schools, yet this is offset by very high fees for international students for those courses and the additional subject-cost funding from HEFCE/OfS.

Although the price competition in the HE market does not really exist, universities in England compete with each other in quality, both in teaching and research. The England’s HE has two excellence frameworks that apply to universities, the Research Excellence Framework (REF) and the Teaching Excellence Framework (TEF), both of which are discussed in this report. England’s universities traditionally feature high on international university rankings,⁶ which is one of the major attractions for international students. In addition to that, there are a number of UK league tables in HE (Turnbull, 2018) which are seen as helpful for various stakeholders, such as policymakers, prospective students and their parents for assessing quality of universities. These league tables, often compiled and published regularly by nation-wide newspapers, such as the Guardian and The Times and Sunday Times, bring

⁶ Such as the Times Higher Education World University Rankings, the QS World University Rankings, CWTS Leiden Ranking etc.

universities into a competitive environment. However, there is a general consensus that such league tables and rankings have to be interpreted cautiously, because students can choose a particular HE provider for different reasons, often including considerations that are not measured by the current league tables and rankings.

Competition for students does not only happen among universities, but also affects FECs. A very recently report published by the Further Education Trust for Leadership (Keep, 2018) highlights the growing competition for students that FECs face from both secondary schools and universities. There are several reasons for that:

- A demographic downturn apparent in older pupils results in unused capacities in many local areas in England.
- University-based education is still seen as a mainstream provider of higher technical and vocational skills and attracts additional funding through tuition fees, which could be used to increase attractiveness for students.
- University-based education also experiences overcapacity and some universities are seeing numbers of applications fall.

2.5 The Teaching Excellence Framework

The Teaching Excellence Framework (TEF) is the UK's government (more specifically of HEFCE/OfS) response to a gradually declining level of attention given to teaching at universities, as opposed to research. This worsened in recent years when the government allowed universities to increase tuition fees to £9,250 per year and students increasingly complained about the value for money they were getting from their courses as a product of such a large increase in fees without any tangible change in their university experience, which meant more student scrutiny of teaching quality.

HEFCE responded with the implementation of the Teaching Excellence Framework (TEF) in 2017. The primary aim of the TEF is to provide prospective students with a resource with which to make a choice about where to study based upon teaching quality. The TEF measures the quality of (mainly in England) a university's teaching, for which a bronze, silver or gold status is awarded based upon their performance (Office for Students, 2018). These ratings are determined by six core metrics in teaching, academic support and progression to employment, including the results of the National Student Survey (NSS). Universities also submit a 15-page document to a panel of HE experts and students, which is used alongside the metrics to determine a rating. Universities have to opt-in to TEF to receive a classification and 134 did so in 2017.

Many within and outside the sector have expressed criticism with how the TEF works. A review by Universities UK found that *“there is a high degree of confidence that the TEF will increase institutional focus on teaching and learning, but that there are notable concerns about how it defines and measures excellence”* (2017, p. 27). The Royal Statistical Society stated in response to the two TEF public consultations in 2017 and 2018: *“there is a real risk that the latest consultation's statistically inadequate approach will lead to distorted results, misleading rankings and a system which lacks validity and is unnecessarily vulnerable to being ‘gamed’.”* (2018, p. 1)

The TEF is not a performance based funding tool like the REF, the only exception being that those with a TEF award may charge undergraduate students up to £9,250 per year of study (normal rate: £9,000). Despite not significantly impacting upon direct income, the reputational impact of not being awarded 'gold' may have a negative impact on future admissions income. The measurement of teaching and research excellence as one entity is not currently possible as the REF and TEF subject-level measures currently use different disciplinary classifications, despite both being government-led measures. For example, agriculture falls into “Medicine, health and life sciences” in the REF but “Natural science” in the TEF.

2.6 Review of Post-18 education

A review of post-18 education was launched by the UK Prime Minister in a speech in February 2018⁷. Due to be published in full in 2019, the review will look at how the Government can “ensure that the education system for those aged 18 years and over is accessible to all, is supported by a funding system that provides value for money and works for students and taxpayers, incentivises choice and competition across the sector, and encourages the development of the skills that we need as a country.” (Department for Education, 2018, p. 1) Commentators have suggested that this review could result in lower fees for some courses that cost less to deliver and the return of maintenance grants.

This review comes in the wake of a new development in Tertiary Vocational Education and Training (TVET) that was initially announced in 2016 (BIS, 2016). Technical education in the UK will see a new qualification in the form of a “T-Level” at level 3, aiming to provide a high quality technical qualification to rival traditional academic options for 16-18-year-olds. (Department for Education, 2018) The courses will be further education based and college taught with a three month work placement or conducted through an apprenticeship and part-time education with the first to be introduced from 2019. The intention is for T-Level students to progress directly onto higher level technical education courses. This development was echoed and reinforced in the announcement of the post-18 review, giving TVET and VET a higher profile in the often academically dominated HE sector.

3 Access to higher education in England

3.1 Widening participation in higher education

The England’s system of university admissions was created in 1961 when the Universities and Colleges Admissions Services (UCAS) were established. The system has traditionally worked at the national level on the assumption that most students will move away from home, and this assumption has underpinned policy making. However, this is not true anymore, because only one in five students behaves in this way. Students are admitted to study a specific subject (not as generalists for the first two years like in the US for example). In England, no one has a right to study at university because no public authority has the power to enforce any such claim on autonomous universities (Willetts, 2017). The most common route to university is through A-levels or the less commonly taken Business and Technology Education Council Diplomas (BTECs), approximately at the age of 18.

England’s HE system recognises two different terms: access to HE and participation in HE (Willetts, 2017). Participation in HE denotes the numbers and structure of people from different backgrounds going on to HE, whereas access means to what extent specific groups of people are able to access universities. In general, people from more advantaged backgrounds are approximately three times more likely to go to university and six times more likely to get into the most prestigious universities than those from disadvantaged backgrounds.

Participation rates of young people in HE have grown from 10-15% in the 1980s to over 45% in 2017/18. The middle class in England generally expect that their children will go to university, which is an important driver for university expansion (Schwartz, 2004). However, despite this dramatic expansion, there are still enormous differences in participation rates in England (and the UK in general), both across and within regional communities. For example, participation rates vary by local authority, from between 23% and 62% (Martin, 2018).

The strongest predictor of whether an 18 year old living in England (or in the UK) will go to university is an individual’s postcode. There is a difference in participation rates of around 40% between those who live in disadvantaged areas compared to those living in advantaged areas, although both groups have seen higher participation rates historically (HEFCE, 2013). Whether an individual’s parents went to university has historically been a significant factor for first time entrants into HE, but this gap has

⁷ The Rt Hon Theresa May MP, 19th February 2018, <https://www.gov.uk/government/speeches/pm-the-right-education-for-everyone>

steadily reduced over the past decade and is now almost non-existent. However, parental education and an individual's postcode are correlated in terms of who goes to university, those entering university from disadvantaged areas are more likely to have parents who did not attend university (66%) compared to those in advantaged areas (33%) (HEFCE, 2017). Furthermore, there are issues around access for Black and Minority Ethnic (BME) students into the most prestigious universities. Our interview pointed out a “leaky pipeline” where BME students enter university but do not progress into postgraduate and research degrees then onto academic positions compared to their white and Asian counterparts. This also exists for women, despite the fact that more women attend university than men at all levels of study, male academics and professors outnumber women at the same level disproportionately.

Another indicator of widening access to HE is the number of pupils in receipt of Free School Meals⁸ (FSM). Although the progression rate of FSM pupils to HE has increased between 2005/2006 and 2014/2015, the gap between progression of FSM pupils and non-FSM pupils has widened in the same period too. In 2014/2015, 41% of non-FSM pupils progressed to HE, compared to only 24% of FSM pupils, resulting in a gap of 18%, which has been the average percentage gap for the past decade (Department for Education, 2017).

The UK government set up the Office of Fair Access (OFFA; currently part of the Office for Students (OfS) as the Directorate of Fair Access and Participation) to tackle an issue of discouraging low-income students in the environment of fees and loans. Universities are obliged to submit to OFFA/OfS an Access Agreement specifying how they will spend some of their fee income on widening access. This could include offers of institutional financial aid, setting outreach performance targets and specifying retention activities. Secondary schools in England routinely provide general information about HE to their pupils and students. However, beyond that, universities have an important role to play in outreach to secondary schools and they are encouraged to do so by OFFA/OfS (Dougherty & Callender, 2017), especially with regard to less advantaged students.

Following the 2015 removal of maintenance grants (which meant an increase in maintenance loans available for poorer students) and the increase in the tuition fee cap in 2017 (a more detailed description of the tuition fee system is provided below), students from the poorest 40% of families graduate with the largest debts: around £57,000 on average, compared with around £43,000 for students from the richest 30% of families (Belfield, Britton, Dearden, & Erve, 2017). The 2017 unpaid student loan figure sat at £90 billion.⁹ Between 2012/13 and 2016/17, part-time student numbers have decreased by 22% (139,485) since those fee increases (HESA, 2018), most of whom are mature students (aged over 21 at entry to HE). These students are overrepresented in courses such as nursing and midwifery (courses encouraged to gain more students by the government), that have also recently lost study support bursaries, compounding the issue (Matthews-King, 2018).

3.2 Mobility across different higher education providers

In England, universities are not the only providers of HE although they serve the majority of students. The possibility of transferring between FECs and universities can be seen as supporting social mobility and contributing to widening participation in HE. The emphasis placed on widening participation in recent years has resulted in more “working class” young people at university than ever before (Social Mobility Commission, 2017).

Yet, reports show that there is quite a high level of fragmentation in the HE system (Social Mobility Commission, 2017) and that there are a number of challenges and limitations linked to transfers from FECs to universities. For example, both student retention rates and graduate outcomes for the same group have scarcely improved in the last two decades. Students with prior vocational qualification who go on to achieve bachelor's qualifications still have more risk of dropping out of university than students who enter HE straight after completing their A-levels (Dougherty & Callender, 2017). In 2017, around 43%

⁸ For children whose parents are in receipt of state benefits (e.g. unemployment, disability) and are therefore less able to provide for their children. More information here: <https://www.gov.uk/apply-free-school-meals>

⁹ Student Loans Company data

of young people entered HE, having previously obtained A-Levels or BTECs (Social Mobility Commission, 2017). Students are able to apply to access or foundation courses delivered at both university and FEC providers if they do not have the required qualifications to apply for a full degree programme.

Widening participation of universities in England rarely involved those who are in further and vocational education, putting too much emphasis on academic pathways. In fact, only 2.4% of students in FECs transfer into HE study and consequently face careers which often give them lower economic outcomes compared to HE graduate outcomes (Social Mobility Commission, 2017). The social impact of this is feeding into an ever more divided society, as indicated by the fault lines shown up in the 2017 general election and in the 2016 Brexit referendum.

Furthermore, FECs seem to be rather at the periphery of the national policy discourse about widening participation in HE, therefore potentially not contributing to achieving this objective as much as they could be. The review of post-18 education and funding is likely to encourage FECs to play a major role in helping to close skills gaps, to provide a second chance to learners after school and be part of the national discourse about widening access to HE (Keohane, 2017).

It is also important to note that transfers at the undergraduate level remain low in general even across different universities. In 2017, HEFCE (2017) estimated that only approximately 1.5%-2% of entrants each year undertake these transfers. Transfers are more common in London than elsewhere. Transfers from universities to FECs are equally as rare.

4 Financing of higher education in England

The total income for UK's universities was £32.4bn in 2014/15: £17.9bn from teaching income, £9.2bn from research income and £5.7bn from other sources.¹⁰ This chapter describes the various financing streams into HE, with a focus on teaching. The research financing system is more complex and is presented in a later chapter.

4.1 Governmental financing

The HEFCE/OfS grant to universities (institutional funding) has the following components, briefly explained here and illustrated in Figure 7 in the Appendix:

- **Teaching** – calculated based on student numbers in high cost areas known as price groups (medicine = high cost, arts and humanities = low cost) and other targeted allocations such as specialist institutions with world-leading teaching and improving provision for disabled students (The Office for Students, 2018)
- **Research** – mostly performance-based funding, using the REF (now Research England's responsibility, see Chapter 5)
- **Capital** – this funds sustainable investment in HE, specifically the Teaching Capital Investment Fund and the Research Capital Investment Fund
- **Knowledge and exchange** – calculated based upon income data from all sources as a proxy measure for university's knowledge exchange performance.
- **National facilities and initiatives** – funds specific initiatives and national HE serving facilities, such as the catalyst fund (funding to support key policy objectives) and galleries and museums.

¹⁰ Data based on 2014/15. Higher Education Funding Council for England, TRAC income and costs by activity 2014-15, 2016 <http://www.hefce.ac.uk/data/year/2016/tracincome/>

Under HE finance arrangements introduced in September 2012, more ‘public’¹¹ funding for teaching is provided directly to students (in the form of upfront tuition fee loans, repayable when the student’s income is above £25,000 per year), and less funding is provided to institutions through HEFCE/OfS teaching grants. This means that a high proportion of public funding for teaching is channelled through the Student Loans Company who distribute tuition and maintenance loans to students. HEFCE/OfS’s teaching grant is directed towards areas where tuition fees alone may be insufficient to meet institutions’ full costs: high-cost subjects; postgraduate provision; supporting students who are at risk of withdrawing from their studies or who may need additional support to succeed (such as those with disabilities); and specialist institutions with world-leading teaching. The most significant of these is the high cost subject support, which simply means that more financial support is needed to teach a medical degree than a history degree programme to cover additional costs for equipment and specialised facilities.

4.2 Private financing

In 1999, the UK Government set the target that 50% of young people in England should attend university by 2010.¹² Figure 3 in the Appendix shows that the Higher Education Initial Participation Rate (HEIPR)¹³ in 2015/16 was 49%, up from 39% in 1999/00, the target has almost been reached over 15 years on and represents a 60,000 increase in first time entrants. The introduction of tuition fees across the UK in 1998/99 (£1,000 paid upfront) meant that HE received a boost in funding from this private source. Fees were then increased in 2004 to a maximum of £3,000 in the form of an income-contingent loan supplied by the government’s Student Loans Company to supplement direct government funding to universities, as the expansion of HE had outstripped economic growth. In 2012, the UK Government increased tuition fees for UK/EU domiciles students from a maximum of £3,000 to £9,000 for the academic year 2012/13. A cap on student numbers per university existed to limit the amount of funding the government had to supply in its HEFCE/OfS block grant, this was enforced with fines if universities over-recruited (Hillman, 2014). This was lifted for the 2015/16 year, allowing universities to recruit more than ever before, this saw an increase in applications by 3% (UCAS, 2015).

The choices made by students are now conceived of as customers exercising choice in paying for a product in a market – and no longer as citizens exercising a social right - were intended to drive the development of the system, reshaping it through competition between institutions. The maximum cap then increased to £9,250 with the introduction of the Teaching Excellence Framework (TEF), which allowed universities receiving TEF accreditation to charge this higher fee. Much of the justification for increased fees is that graduates earn more than non-graduates over the course of their lives, which is true¹⁴, yet such high debt repayments over a longer time closes this earnings advantage sharply.

In 2006 (and prior to 1998), living costs were supplemented with income contingent ‘maintenance grants’ from the government, which were intended to support students with lower parental incomes to pay for their university living costs. There were also income contingent maintenance loans that were available to all students who applied for them, again, dependent on parental income. Maintenance grants were completely abolished in 2015, making loans from the Student Loans Company the only government-backed option (Belfield, Britton, Dearden, & Erve, 2017). This system further exacerbates the student debt problem¹⁵.

Non-EU students, known as “international students”, pay £13,461 per student per year for tuition on average, compared to the £9,250 maximum charged to UK and EU students. FECs with Access and Participation Plans approved by the OFFA/OfS charge £7,486 per year for their degrees on average in

¹¹ Tuition and maintenance loans are termed as public funding here because the loans are provided and guaranteed by the government, although the student ultimately pays them back and thus might be considered private funding

¹² Tony Blair, Labour Party Conference Speech, 1999

¹³ This covers 17 to 30 year old English domiciled first-time participants in HE at UK HE Institutions, and at English, Welsh and Scottish Further Education Colleges

¹⁴ Graduate Labour Market Statistics for England, 2016

¹⁵ Three years of tuition = £27,750, three years of maintenance loan at average rate = £18,800. Total = £46,550 plus 6.1% interest accruing from the first day of university study.

2017 compared to those that do not have a plan and are publicly funded cannot charge more than £6,165 per year (Belgutay, 2016). At ‘alternative’ HE providers that are not eligible for funding from HEFCE/OfS, students may only borrow tuition fee loans of £6,165, although many of these providers charge more than this per year (Hillman, 2018, pp. 7-8).

5 Research system in England

5.1 Research funding in England

Before April 2018, there were seven research councils, HEFCE and Innovate UK (the UK’s innovation agency) providing funding for research at universities in England. All funding bodies were independent from each other, yet they cooperated together. In April 2018, UK Research and Innovation (UKRI) was established in response to Sir Paul Nurse’s review of the research councils that stated: “*To strengthen Research Councils in the effective formulation of strategy, promotion of research, and engagement with their communities, the partnership of the seven Councils making up RCUK should evolve into Research UK.*” (2015, p. 33). HEFCE has been abolished and its research funding function was replaced by Research England as part of this, and it was subsumed under UKRI, whilst teaching funding went to the OfS. This was also to see a greater co-ordination of research on strategic priorities and greater recognition of interdisciplinary research. As the establishment of UKRI is very recent, it remains to be seen how this new arrangement will work in practice and how it will impact upon the research base in terms of how the instruments of institutional and competitive funding are adjusted.

Most research in England is undertaken within universities. Figure 5 in the Appendix shows that UK universities spend £8 billion on research and development (£6,6 billion in England). This is 24% of all R&D expenditure in the UK, which was £33.13bn. The government contributed 60% of these funds, 19% came from non-profit sources and business, 17% from overseas and 4% from other HE income. Figure 6 in the Appendix shows how the UK’s Higher Education Expenditure on R&D (HERD) grew from 0.3% of GDP in 1981 to 0.44% in 2014 (not shown - 2016 was 0.41%). However, HERD is surprisingly low for a country this size has been consistently low compared to the Netherlands and Switzerland.

The UK has a ‘dual support system’ for university research: (1) institutional funding supplied by UKRI (formerly HEFCE); (2) Competitively sought external funding (project-based funding from various public and private sources). In England, HEFCE’s allocation of mainstream Quality Related (QR) funding to universities considers the volume of research being conducted (numbers of research active staff), subject cost weights (medicine costs more to teach than history, for example), research quality (measured by the REF) and the London weighting¹⁶. London weighting, introduced in 2002/03, is a bonus paid to universities with London post codes intended to compensate for the higher costs of operating in London compared with other parts of the UK. It is delivered as a percentage of the funding they obtain based on their REF quality rating.

There are other sources of research funding in the UK that operate like the mainstream QR in that they are mostly performance based. The Research Degree Programme supervision fund provides money for PhD places based on a university’s REF performance. The QR charity support fund is based upon a university’s charity income, calculated pro-rata based upon what proportion of the total amount charities distributed was won by each university. For example, if one university won 15% of the total funding allocated by charities they get 15% of the QR charity support offered by HEFCE, so this is a performance based measure. The QR business element works the same way. The national research library fund aims to support research infrastructure, specifically five designated research libraries that service the HE sector. Mainstream QR funding informed by the REF plateaued around 2005/06 at approximately £1bn while other sources of performance based research funding increased and became around a third of all institutional research funding by 2015/16 (Arnold, et al., 2017). Figure 4 in the

¹⁶ <http://www.hefce.ac.uk/rsrch/funding/mainstream/> See also the guide on how HEFCE allocates funding: http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2016/201607/HEFCE2016_07.pdf

appendix illustrates the proportion of institutional funding from HEFCE to English universities for 2015/16.

5.2 The Research Excellence Framework (REF)

The dual support system provides all UK universities with incentives to conduct excellent world-class research that addresses societal and industrial challenges. The research element of the institutional funding (£1,930m in 2016/17 to 122 UK universities) is distributed by Research England based on the volume of research, subject cost weights and quality of research, as measured by the Research Excellence Framework (REF). This means that those universities that are 'research intensive' and produce a lot of peer reviewed research are judged to be of a higher REF quality than those who produce less, thus they receive more quality related (QR) funding for research. (Hughes A. , Kitson, Bullock, & Milner, 2013)

The REF is the UK's current performance-based research funding system and has three defined aims: (1) Inform the selective allocation of research funding to universities; (2) Provide benchmarking information and establish reputational yardsticks; (3) Provide accountability for public investment in research and demonstrate its benefits. It succeeded the Research Assessment Exercise (RAE) in 2008 as there were questions about whether that peer review based system was as effective and efficient as it could be. The first iteration of REF occurred in 2014 with the second planned for 2021, although the first of these exercises in UK began in 1986.

The REF diverges somewhat from other countries' research assessment tools as it relies much more on the peer reviewed outputs of research that are submitted to it by the UK universities, as compared to other countries who use indicator centric systems with minimal peer review. The UK and New Zealand are the only two countries relying close-to-uniquely on peer review. Peer review is the main method of assessment in the UK system, which take the form of 'units of assessment' that group the various disciplines for review. Universities submitted the following for REF 2014 (submissions have changed slightly at every iteration):

- Staff details (research active staff selected), including individual staff circumstances
- Research outputs: up to four research outputs produced by each member of submitted staff (65%)
- Impact template and case studies, underpinned by research excellence (20%), highlighting the value of research for the wider society
- Environment: data on research doctoral degrees awarded, the amounts and sources of external research income and research income-in-kind (15%)

One distinct disadvantage of the REF is that the costs of the exercise have been regarded both nationally and internationally as large due to the effort required for universities to submit to the REF (Farla & Simmonds, 2015). There are also concerns that the REF discourages collaboration since only the lead author of publications are counted, which may also discourage interdisciplinary working.

Regarding valorisation, or the commercial outputs of research, REF2021 has warned institutions against focusing solely on indicators related to publications in journals (measures by means of bibliometrics (impact factors and H-index)) and has instead encouraged a wider variety of outputs to be reviewed by the panels. However, there is no evidence that the REF has explicitly encouraged the valorisation of research and that other outputs (journal articles, conference proceedings monographs) will continue to dominate submissions. Table 1 in the Appendix shows the main performance based research assessment policy objectives relating to research in the UK, Swiss and Dutch systems.

The consultation¹⁷ about the next REF (2021) is in progress (as of July 2018). It aims to better involve the community in how they are assessed. Although the final ruleset is not yet known, there are some key changes in this exercise worth pointing out here. In 2021, the outputs of staff who have moved institutions can be eligible for both their previous and current employer and all staff engaged in research of any description must now be included in an institution's REF submission. These changes mean that

¹⁷ REF2021 (2018) Consultation on the panel criteria and working methods (2018/02)
<http://www.ref.ac.uk/publications/2018/consultationonthedraftpanelcriteriaandworkingmethods201802.html>

‘academic poaching’ (hiring prestigious researchers specifically for the REF submission) and ‘game playing’ (including only the best researchers) should have less impact than it did in the 2014 iteration (Kernohan, 2018), as identified in the Stern Review (2016). Finally, REF2014 gave an assessment weighting of 20% to the impact of submitted research that will now raise to 25% for REF2021, which indicates an increased focus on impact for research quality assessment. This plays into a wider impact agenda in research funding in the UK.

Figure 7 in the Appendix shows means of the normalised citation scores for 15 countries. There is some conjecture that the implementation of a performance related funding system in a country will increase this score. The UK’s score went up when the Research Assessment Exercise (predecessor to REF) was introduced in 1986, and this was the case for other countries when a system like this was introduced, however, this is more association than causation. For example, this does not explain how the Swiss have always maintained a high score without such an exercise.

In 2017, the government announced that it would launch a Knowledge Exchange Framework (KEF) addressing the third mission of HE, in order to bring the research, teaching and third mission incentives into a more appropriate balance (HEFCE, 2017). According to the website of Research England who are implementing the KEF: “[The KEF] is intended to increase efficiency and effectiveness in use of public funding for knowledge exchange, to further a culture of continuous improvement in universities by providing a package of support to keep English university knowledge exchange operating at a world class standard.” (Research England, 2018) The details on what this framework will measure and how are still undecided, including whether this framework should be tied to funding, like the REF.

5.3 Full economic costing of research

From 2005, a principle of ‘full economic costing’¹⁸ of research was introduced across UK universities. UK universities are required to calculate the total costs of any project they won through competitive funding for research at full economic costs. It is well known in the UK that funding for university research is not fully covered by the government. The full economic costing of teaching and research in HE in the UK totalled £35.5bn: £16.4bn for teaching and £12.1bn for research in 2014/15 (Olive, 2017). This represents a total deficit of £3.1bn, mostly in research. As might be expected, deficits in one area are supported by surpluses in other, as HEPI (2017) identify: “The surplus from teaching funded 13 per cent of all UK university research in 2014/15. Almost £1 in £7 spent on research came from surpluses on teaching.” In England, this research deficit was £2.8bn in 2014/15, of which £1.4bn was made up from surpluses from teaching private tuition fees). For research grants provided by one of the seven research councils, universities can receive only up to 80% of the full economic costs linked to the grants. In simple terms, this means that a research council would award £80,000 for a project that had a full cost of £100,000.

The difference between the shortfall is partly made up for by other sources of research funding, such as the Research England/HEFCE institutional funding grant and/or international student fees. International students (i.e. those coming from outside the UK/EU) pay more than the full economic costs of being taught (Olive, 2017). In fact, non-EU students contribute around £8,000 to UK research over the course of their degree programme.¹⁹ However, international student numbers have been falling, which may threaten this surplus; in 2016, offer acceptances from international prospective students fell by 2.3%. (UCAS, 2016).

The Universities of Oxford and Cambridge are outliers in that they are able to access much larger sources of private income (Ashworth, 2016), including: larger private donations and trade benefits that make up around 23% of Oxford’s budgeted income (e.g. Oxford University Press) (Oxford University, 2017). They are able to cover the teaching and research deficit with that private income despite the cost of teaching their undergraduates being higher on average than other universities (£16,000 per year per student).

¹⁸ Full economic costing is a UK government-directed standard costing methodology used across the UK Higher Education sector for the production of consistent and transparent research project costs

¹⁹ Office for National Statistics, Universities UK and Higher Education Policy Institute data

5.4 Interlink between education and research

Like in many other HE systems around the world, various policy studies in England agree on the necessity and benefits stemming from connecting education with research activities (Fung, 2017) and (Tong, Standen, & Sotiriou, 2018). A recent report by the Russell Group (2014, p. 29) describes the importance of integrating research results into teaching at universities to create a research-intensive environment, which helps students “*take their thinking to a new level and develop skills they need for a wide range of careers.*” Students should therefore engage in research and gradually develop their abilities to think like researchers, both in groups and independently. This could include for example participating in peer review processes, data collection and investigations and formulating critical arguments and conclusions. Academics have an important role to play in this process because they have to proactively mediate and create conditions for students to be able to engage in research already as part of undergraduate study programmes. In addition, England has seen a number of interdisciplinary research centres at universities emerge, which provides the necessary flexibility for conducting research. Because of the research intensity, academics would be bringing results of their research into teaching, which keeps the teaching quality up.

Given the limited financial resources, in England’s HE, the linkages between education and research are under heavy scrutiny. Universities are regularly forced to make difficult choices about their priorities in pursuit of prestige, whilst facing limited resources. As a result, a number of academics may find themselves under pressure to devote enough time and energy to engage in both teaching and research activities. This is a product of how they are assessed; those on research contracts are evaluated under the REF yet have increasingly heavy teaching loads.

6 Internationalisation of higher education in England

6.1 Importance of international students for higher education in England

Internationalisation has many interpretations in the UK context. It can refer to student / staff mobility, international research collaboration or a global view on the universities mission and its teaching. The UK has been a significant player globally in the international HE student market. In fact, it is the second largest market after the US (UUKi, 2018; Ilieva, 2017). The UK attracts around 450,000 students from abroad, making up around a quarter of the student body. In 2017/2018, in spite of the uncertainties of Brexit, the UK is still seeing increasing numbers of applications from EU students. The financial projections for fees paid by international students to 2018/19 are equivalent to 15% of total university income on average (Russell Group, 2017). This translated to £4.2bn in tuition fees in 2014/15 (Universities UK, 2016). International students pay on average £10,000 more per year for tuition than UK/EU students and bringing in approximately £9bn in export revenues per year (Willets, 2017, p. 303). It is important to note that the tuition fee for international students has no set maximum fee, meaning that many more prestigious universities charge in excess of £18,000 per student per year for classroom courses and £38,000 for medical learning programmes.²⁰ These higher fees subsidise the losses UK universities make on educating UK/EU student who pay much lower fees and do not always cover the cost of education. The UK makes around £3bn from Chinese students alone who make up 100,000 students in UK HE (HESA, 2017). Seventy percent of UK Masters degree enrolments are from abroad²¹. The University of Sheffield earned a net benefit of £140m from its overseas students (Oxford Economics, 2013), to take one university as an example. International students also form the academic pipeline: completing PhDs and becoming researchers.

Forty percent of UK researchers are from abroad²² and only 28% of all UK researchers have never worked outside of the UK (Elsevier, 2013, p. 26). The UK is second to Canada for the proportion of

²⁰ Data from England table at <https://www.thecompleteuniversityguide.co.uk/university-tuition-fees/reddin-survey-of-university-tuition-fees/foundation-undergraduate-tuition-fees-2017-18,-overseas/#england>

²¹ HESA Student Record 2014/15

²² HESA Staff Record 2014/15

researchers who have come from abroad and stayed for more than two years (Elsevier, 2017). Half the papers published by UK researchers with an overseas academic and are more often cited than those who do not include an overseas academic. The improvement in citation rates observed in the UK and other countries is accompanied by an increasing amount of international collaboration. The proportion of publications in the Web of Science written in collaboration between UK and non-UK researchers, compared with the wholly domestic production (Figure 9 in the Appendix).

There are 200,000 international students studying at Russell Group universities, making up 34% of all students and mostly enrolled on postgraduate research courses and in STEM disciplines (Russell Group, 2017). The students are attracted to the high quality of the Russell Group universities and their international reputations, this brings a significant number of international staff members too. The Russell Group is not dependent on those students and staff, but they do help provide the research and teaching expertise from other countries to ensure the UK can be world leading in many fields. The undergraduate international students benefit UK students in that they can access different cultures and languages.

However, the UK has been one of the only global HE destinations that have not seen growth in numbers of international students in the last five years. Globally, internationally mobile students have grown rapidly, but not in the UK. Looking at the international students studying to the UK, there are some very big differences. The numbers of students from China have grown phenomenally over the last decade in the UK and worldwide, but Indian student numbers coming to the UK have fallen drastically (Arrowsmith, 2017). It is estimated that 90% of the international staff come from another EU country. Therefore, there is a substantial reliance upon EU-originated academic staff and their contribution is fundamental for UK research. We see that many areas in England's HE are not sustainable without international staff and students.

The international landscape of HE has been rapidly changing with innovative models of Transnational Education (TNE) being established across the globe. A report on the scale and of UK HE TNE (UUKI, 2018) found that 701,010 students were studying UK HE TNE programmes and that student numbers grew by 17% from 2012-13 to 2015-16. 82% of UK universities were found to deliver HE TNE. The HE sector is clearly committed to the expansion of TNE partnerships which will comprise a growing part of the international education portfolio, particularly in post-Brexit scenarios. Four out of five universities intend to expand their TNE (UUK and British Council, 2016).

6.2 Propensity of UK students to study abroad

EU ministers agreed that by 2020, at least 20% of HE graduates should have had a period of study abroad. The UK adopted this same target in a commitment to boost both types of outward mobility (EHEA Ministerial Conference, 2012). However, the rate of UK students engaging in outward mobility is below the OECD average (OECD, 2017). For example, figures from the 2014/15 academic year show that only 1.2% of UK students engaged in mobility periods abroad (either type), of these most were engaged in short term placements between 1 and 8 weeks (Go International, 2016) (Longer periods abroad have been shown to yield more enduring impacts than shorter periods (Cubillos & Ilvento, 2013)). Figures from 2015/16 show that 3% of 2nd and 3rd year students engage in credit mobility as part of their degree.²³ Studies commissioned by The Department for Business, Innovation and Skills (BIS, now BEIS) found that a student's background had an impact on whether they chose to engage in international mobility (HEFCE, 2004). Specifically, Findlay et al. found that "*motivations for mobility are structured by parental education and occupation and by an individual's schooling, gender, ethnicity and mobility history*" (2010). Although the actual number of students going abroad to study from the UK is increasing, those from disadvantaged backgrounds and minority ethnic groups are less likely to go abroad compared to their contemporaries.²⁴

²³ Based on analysis of HESA data from 2015-16 conducted by UUKi. At: <http://go.international.ac.uk/sites/default/files/Outward%20mobility%20statistics.docx>

²⁴ Based on analysis of HESA data from 2015-16 conducted by UUKi. At: <http://go.international.ac.uk/sites/default/files/Outward%20mobility%20statistics.docx>

Almost twice the number of students from the EU visited the UK through Erasmus compared to the number of UK students studying abroad in 2012/13 (European Commission, 2015). The fees charged by HE providers abroad are typically much less than those charged in the UK, for example in the Netherlands most courses are taught in English, cost around £1,500 per year in tuition and students have access to some state benefits, contributing to increases in UK outward mobility to the Netherlands and represent a competitor to the UK's international market (Huberts, 2015).

7 Linkages between higher education and the labour market in England

7.1 Graduate employment

Graduate employment, skills mismatch and skills gaps are topics that keep resonating in discussions in England. The prospects of the UK's economy are uncertain, due to reasons, such as Brexit and signs of economic protectionism at the global level. However, the available data and statistics suggest that, overall, HE degrees still provide better chances to individuals to succeed at the labour market, compared to their non-graduate peers, and they are more likely to be employed than non-graduates (Office for National Statistics, 2017).

Although the economic forecasts for the UK's economy are somewhat unconvincing, the graduate employment data suggest that the graduate market has largely held up well (Ball, et al., 2018). The graduate labour market, at least for first-degree graduates, is therefore very likely to hold and stay robust after Brexit. As pointed out in interview, if there are setbacks ahead for the economy, they will be less severe for graduates than for workers with lower qualifications, and any damage to the UK graduate labour market is likely to be temporary. Despite a widely-spread perception in the general public that there are too many HE graduates with a bachelor's degree; the data suggest that this is not the case in England. The UK still has a strong and increasing demand for graduates. With the demographic decline in cohorts of young people in the UK set to continue during the next decade, and a fall in university applications in 2017 and 2018, it is unlikely that the national appetite for graduates will weaken significantly any time soon. Although the graduate employment rate fell in 2016, because of the slight rise in graduate numbers, almost exactly the same number of graduates were in work compared with the previous year (Ball, et al., 2018). Furthermore, graduate unemployment in the UK fell and at 5.3%, it was the lowest for graduates since 1989.

In terms of economic sectors, there were particularly large rises in the number of graduates entering roles in nursing, graphic design, marketing, art, sports, cinematography and photography, finance and accounting, and coding and software development in 2016 (Ball, et al., 2018). In contrast, primary and nursery education, medicine, web design and civil engineering saw large falls in the number of graduates entering, which seems seem to be directly attributable to a fall in the number of graduates taking these subjects at first degree level.

The increase in numbers of vocational apprenticeships is not likely to reduce significantly numbers of university graduates. The issue of "parity of esteem" between the vocational route and academic route is very likely to persist. Although apprenticeships continue to improve in attractiveness, even amongst those young people who eventually opt for a full HE degree (e.g. bachelors), confidence in the ability of vocational education to provide sufficient skills flexibility and credibility for the future is not strong and is in decline (University Partnership Programme, 2017). While some employers are likely to make apprenticeships a more prominent feature in their recruitment strategy, this is likely to mean more young people will take them rather than have a large effect on the prospects of individual graduates.

7.2 Demand for graduate skills in the labour market

Although the proportion of young graduates taking up high-skilled jobs is increasing annually (by 1.9 percentage points between 2016 and 2017) (Department for Education, 2018), Universities UK projected (2015) that by 2022, there will be a continued undersupply of graduates, relative to the number of jobs demanding them. There will also be unmet demand for workers with HE, but not necessarily degree-

level (e.g. bachelors), qualifications, such as BTECs or HNDs. The national-level deficit of higher-level skills and a shortage of graduates is projected to continue until 2020–2022 (Universities UK, 2017) and the situation is likely to worsen as the UK leaves the EU, due to any subsequent fall in highly-skilled immigration. As a result, almost two thirds of employers are not confident about accessing high-skilled employees in the future, while their appetite for high-skilled employees is likely to persist. Three quarters of businesses expect to have more job openings for people with higher-level skills over the coming years while just 2% expect to have fewer (CBI, 2017). They also expect to need more people with intermediate-level and leadership and management skills. In contrast, more businesses (29%) expect to cut back on the number of low-skill jobs than expect to grow them (20%). This demand varies by sector, with a reported 84% increase in demand expected for high-level skills in the construction sector in the next three to five years, and a 60% increase in retail and hospitality, and transport and distribution (Universities UK, 2017). On top of that, Universities UK reports that there is evidence of increasing skill requirements across job occupational profiles, suggesting that future demand for graduate skills may be generally underestimated.

Yet, there still remains a strong perception among the public that the UK has too many graduates in general, and that a considerable number of graduates are employed in non-graduate jobs. If it were true that the supply of graduates currently outstrips demand, then a worsening of graduate outcomes would be expected. In fact, the latest figures show that six months after leaving university, 77% of graduates in employment are in professional-level jobs, with this figure rising to 84% three-and-a-half years after graduation. Graduates also earn significantly more than non-graduates, and on average take home £9,500 more per year.

There is also a strong culture around the perception of the bad quality of graduates from non-Russell Group universities, which is often ill-founded. Many businesses and employers require a degree from a Russell Group university, whilst many graduates from other universities have the right set of skills. The shift in culture will take a long time happen. Although that there is an ongoing public perception of the low number of graduates in science, technology, engineering and mathematics (STEM) disciplines, there is only little evidence to underpin this. However, there is a clear shortage of engineering skills at all levels in England. In addition, whilst 27% of current HE students are on courses related to STEM, there may be a blockage in the talent pipeline (Universities UK, 2015). It appears that many STEM students are choosing to abstain from career paths in industries with a high density of skill shortages and may pursue other career pathways, for example in banking and finance sectors or outside engineering.

The graduate labour market in England is not homogenous. Whilst, it is generally strong around large cities, there are challenges for graduates to find a graduate-level job in the countryside. Therefore, rather than mismatch of skills, this could indicate a mismatch of talent utilisation. This is especially case for those graduates that returned home after graduation and are not willing to move to urban areas, such as London and Manchester. In addition, research (Green & Henseke, 2016) suggests that graduates that once do not secure graduate-level jobs and take up non-graduate positions find it harder to get come back.

7.3 Evidence of graduate skill mismatch and gaps

According to the Confederation of British Industry (CBI, 2017), employers feel that they frequently have to pick up where things have not worked in the education system. Many businesses report that they have to address shortfalls in functional skills among young recruits, with two in five reporting that they have organised remedial training for at least some school or college leavers and one in four businesses for at least some graduates in 2016. The most frequently cited skills in need of attention in 2016 were the basic IT skills of older recruits and numeracy for school and college leavers (CBI, 2017).

The, now defunct, UK Commission for Employment and Skills (UKCES), together with the Department for Education (DfE) undertook a large study among employers in 2015 (updated in 2018 by the DfE). The results showed that in some economic sectors, such as Electricity, gas and water, Construction, Transport and storage and Manufacturing, the density of skill-shortage vacancies is higher than 30%. Although this covers also occupations for which graduate skills are not necessary, the skills shortages

are apparent in managerial and associate professional occupations, but most importantly, among professional occupations, for which higher-level skills are required. Figure 10 in the Appendix provides an overview of the density of skill-shortage vacancies by sector and occupation within sector. Skill-shortage vacancies have persistently made difficult recruitment to Machine Operative roles in Construction and Professional roles in the Manufacturing, Business Services, Transport and Communications, and Health and Social Work sectors (UKCES and DfE, 2018).

On the other hand, graduates in England are trained to be adaptable, considered to be a comparative advantage of the England's HE system. One of the interviewees provided the team with an example of graduates in psychology, who show a very low unemployment rate despite only a small proportion of them taking up a job as a psychologist.

7.4 Graduate employment and skills mismatch monitoring surveys

The graduate employment and skills mismatch monitoring is relatively advanced in England. Public or semi-public bodies, such as the DfE and Universities UK regularly collect data and undertake and/or commission research in these areas. Until 2017, the UKCES published detailed reports on skills forecasts and current skills supply and demand on labour market. It was a non-departmental public body that provided advice on skills and employment policy to the UK Government and to the UK's Devolved Administrations (of Scotland, Wales and Northern Ireland). UKCES closed in March 2017, following a government spending review published in 2016. It focused on producing labour market intelligence, increasing employer investment in skills and providing strategic advice and insight on skills and employment issues throughout the UK (Wikipedia, 2017). Some of the activities of the UKCES were discontinued, others were reallocated to other public bodies, including to some government departments, such as the DfE.

The CBI publishes regularly results of its CBI/Pearson Skills survey. It gives an authoritative picture of trends in business opinion, practice and future plans across a wide range of education and skills issues. In 2017, it was conducted in the context of continued economic growth despite uncertainty over the future impact of Brexit. It receives responses from organisations in all sectors (CBI, 2017). In addition, some graduate-level employment and skills monitoring is undertaken at the European level, for example by the European Commission and CEDEFOP.

Besides monitoring the graduate labour market, England's HE graduates annually respond to the Destinations of Leavers from Higher Education (DLHE) survey. The DLHE collects information on what leavers from HE programmes are doing six months after qualifying from their course. The majority of providers collect and return data to the Higher Education Statistics Agency (HESA). FECs currently return data to the Office for Students (OfS). The DLHE will soon be replaced by the Graduate Outcomes Survey. The first one will start in December 2018 and will be managed by HESA (Office for Students, 2018). Graduate Outcomes Survey is a new model for the collection of graduate destinations data. This model allows to capture rich and robust data, and will make sure that the collected information reflects recent changes in the HE sector and in the graduate labour market. In addition to familiar questions from the DLHE, the Graduate Outcomes Survey will ask new questions to provide a richer picture of the diversity of graduate outcomes, such as on their progress towards their future goals (Higher Education Statistics Agency, 2018). While information on HE graduates from universities is more robust, at least for the first six months to three years, the evidence on destinations of HE graduates from FECs, and especially from alternative providers of HE, is considerably less granular and graduate outcomes data are not yet available (Universities UK, 2016).

8 Interviewees

Name	Function, organisation
Charlie Ball	Deputy director for research, Higher Education Careers Support Unit (part of UniversitiesUK)
Erik Arnold	Chairman, Technopolis-Group
Jamie Arrowsmith	Assistant director of policy, Universities UK International (UUKi)
Jessica Moody	Senior Policy Officer, Equality Challenge Unit (part of AdvanceHE)
Rebecca Allinson	Director and Principal of Higher Education, Technopolis Ltd.
Sarah Stevens	Head of Policy, Russell Group

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Appendix A Figures and tables

Figure 2 New provider application process

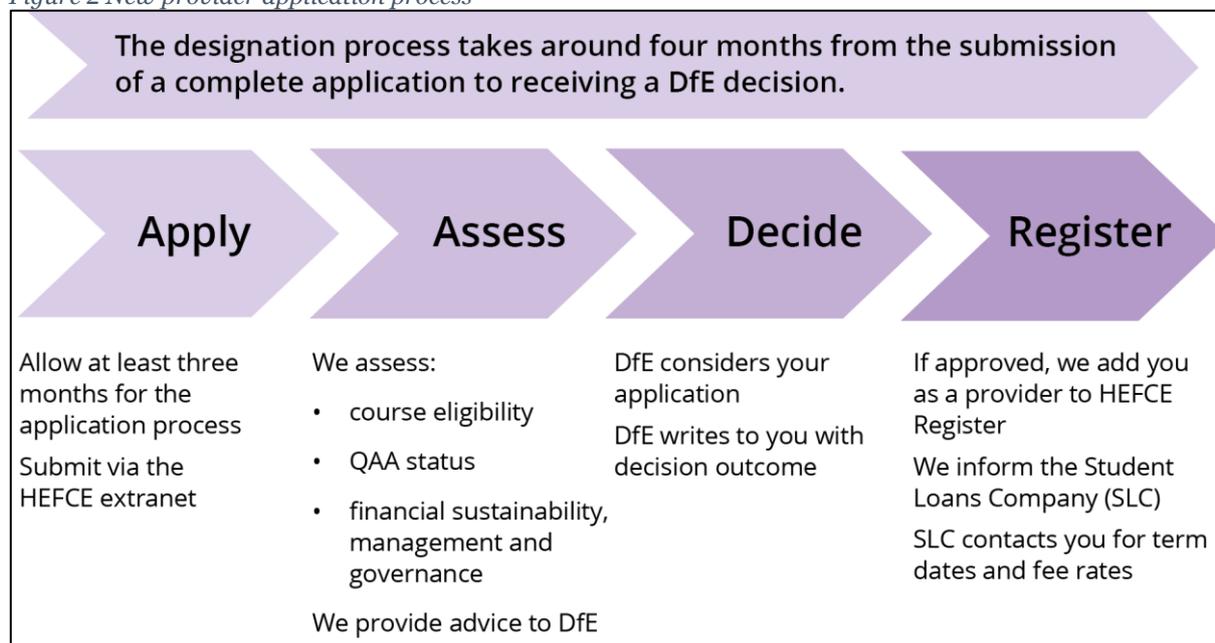
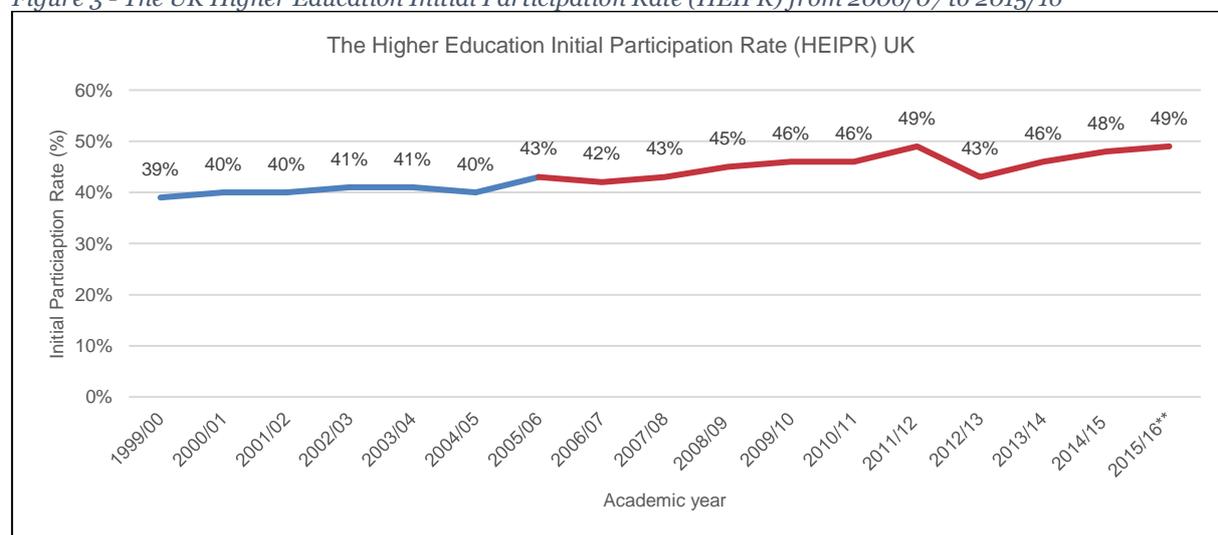
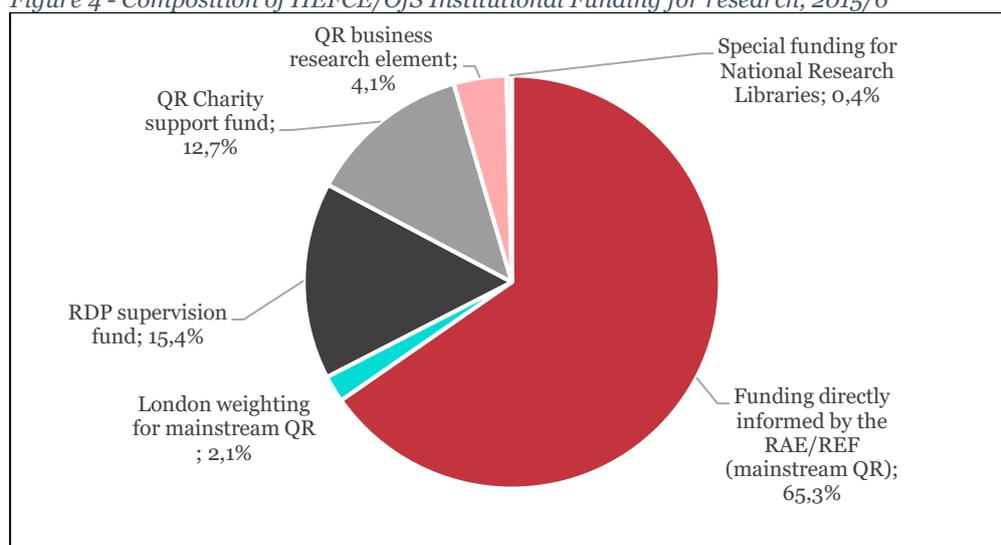


Figure 3 - The UK Higher Education Initial Participation Rate (HEIPR) from 2006/07 to 2015/16



Source: Technopolis analysis, data from Department of Education “Participation rates in higher education: 2006 to 2016” at: <https://www.gov.uk/government/statistics/participation-rates-in-higher-education-2006-to-2016> *Blue indicates the use of a slightly different methodology of measuring numbers before 2006/07; **provisional figures for 2015/16

Figure 4 - Composition of HEFCE/OFS Institutional Funding for research, 2015/6



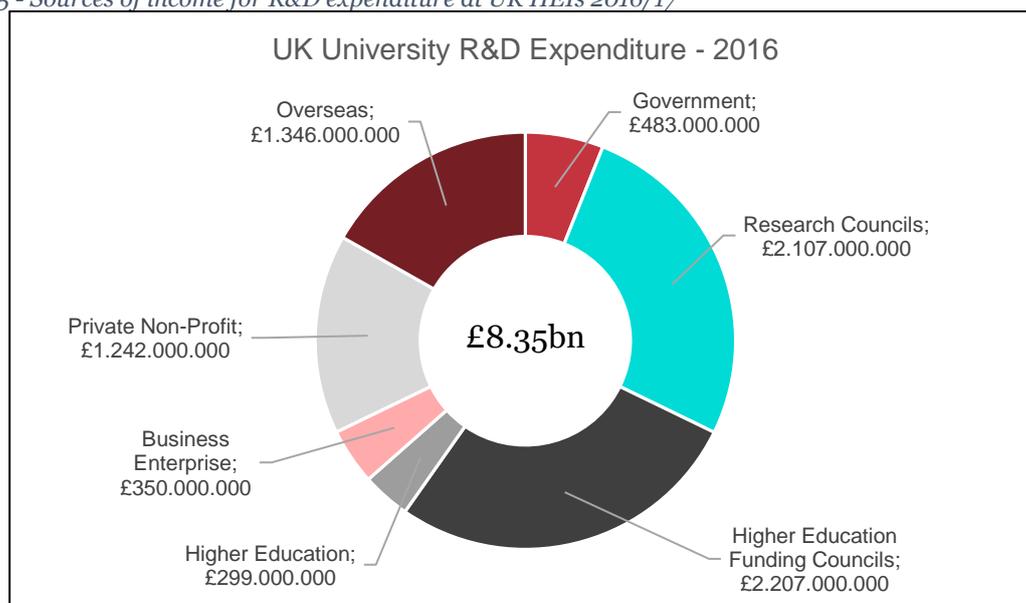
Source: Arnold et al. (2017, p. 39). Analysis by Technopolis, data from HEFCE.

Table 1 - Main performance based research assessment policy objectives in comparator countries

Country	Quality of research	Systemic factors	Accountability	Strategic intelligence
Netherlands (2015)	Reveal and confirm the quality of research	n/a	Reveal and confirm the relevance of the research to society	Improve quality and relevance of research where necessary
UK (REF, 2014)	Reward research excellence	n/a	Produce evidence of the benefits of public investment in research	Provide benchmarking information and establish reputational yardsticks, for use within the higher education sector and for public information

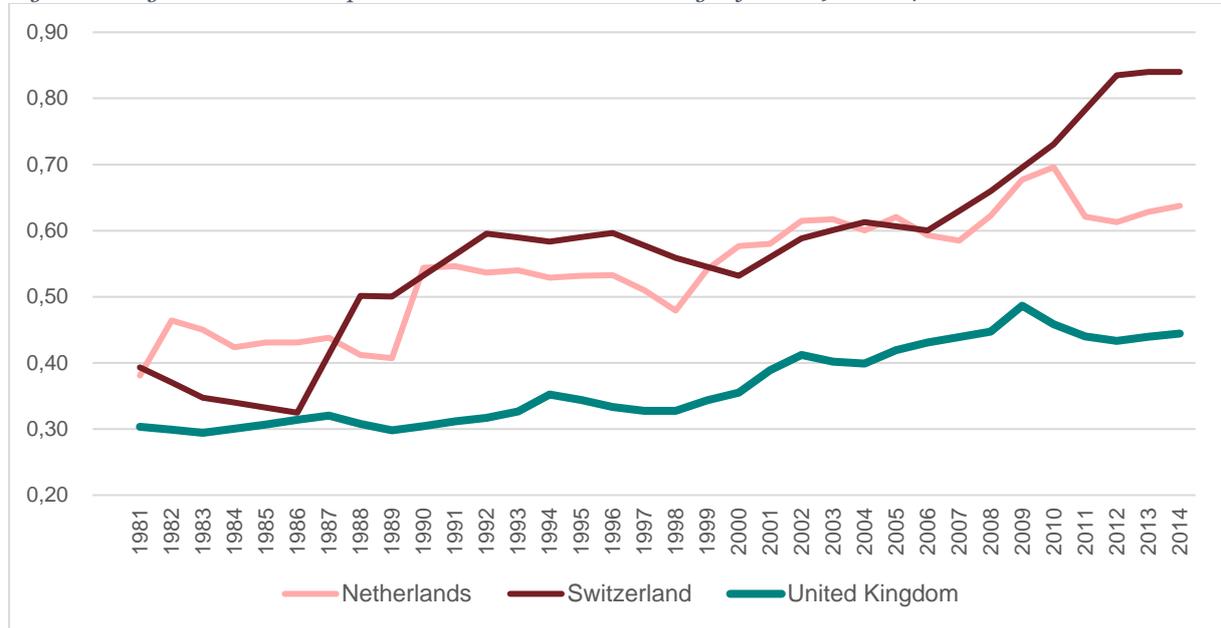
Sources: Mahieu and Arnold (2015) for UK and the Netherlands.

Figure 5 - Sources of income for R&D expenditure at UK HEIs 2016/17



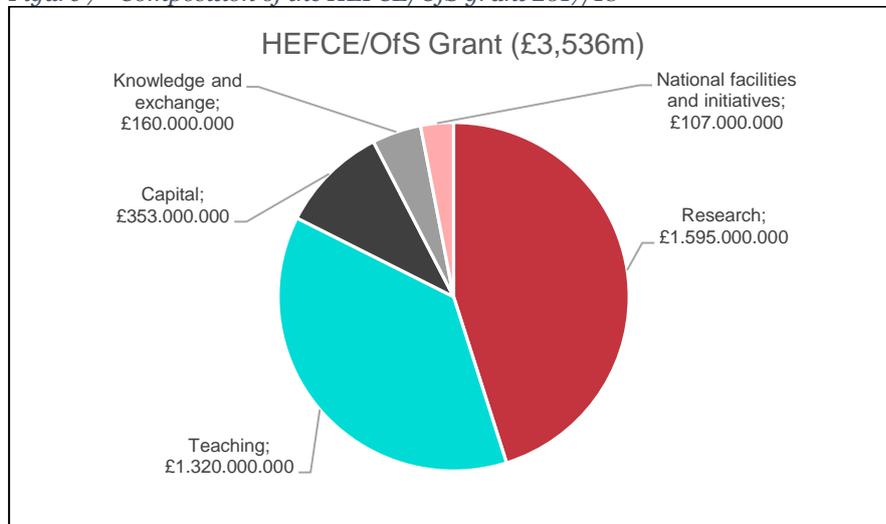
Source: Office for National Statistics, UK gross domestic expenditure on research and development 2016, 2018 <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datasets/ukgrossdomesticexpenditureonresearchanddevelopment>

Figure 6 - Higher Education Expenditure on R&D as a Percentage of GDP 1981-2014



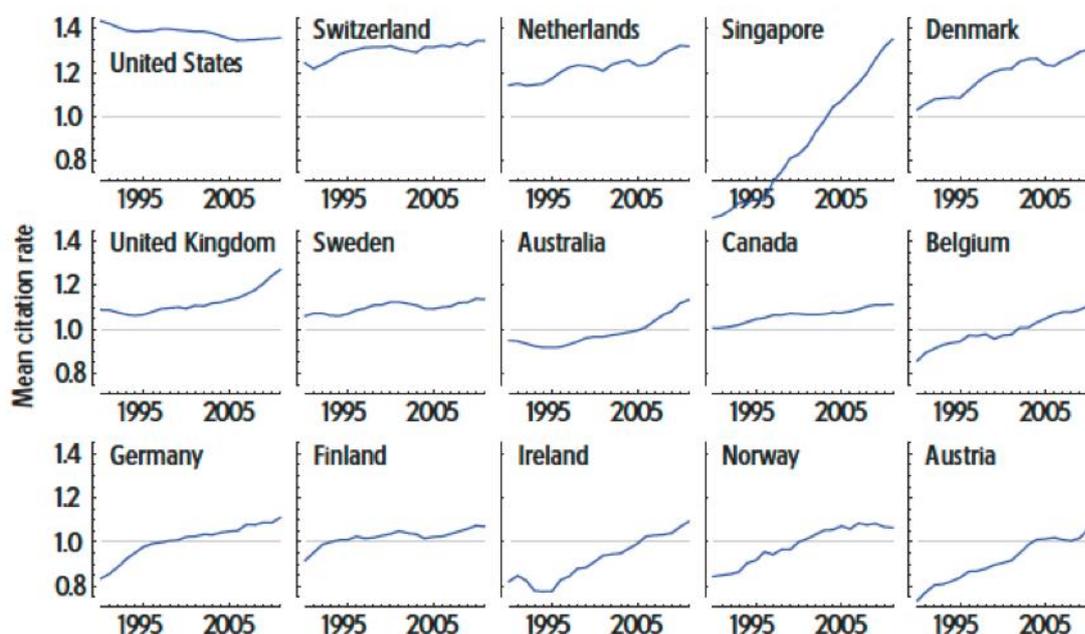
Source: Chart from Arnold et al (2017), data from OECD Main Science and Technology Indicators (MSTI)

Figure 7 - Composition of the HEFCE/OfS grant 2017/18



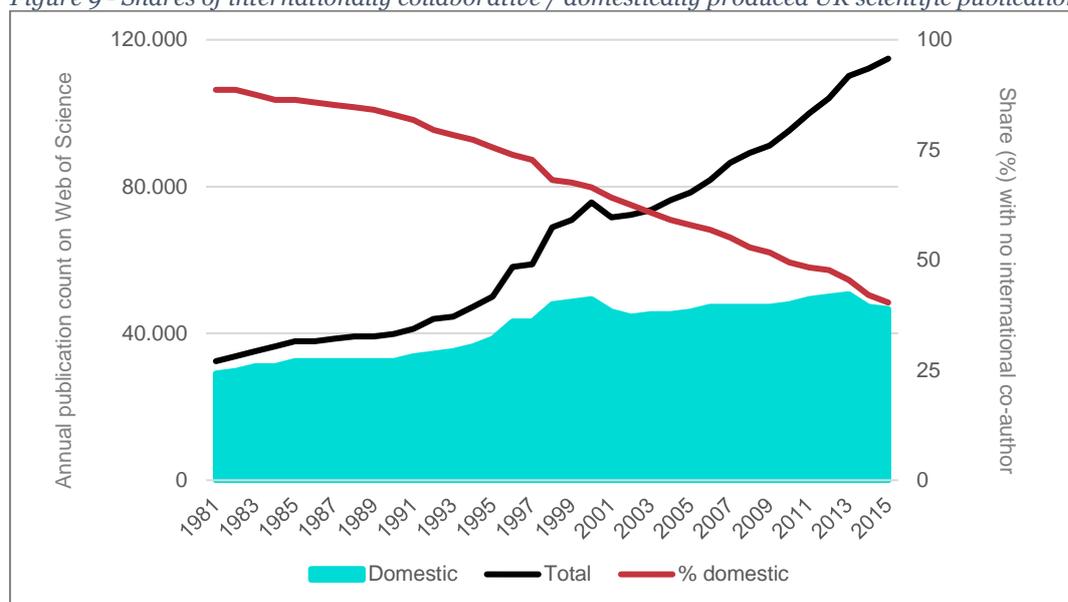
Source: Data from HEFCE (2017)

Figure 8 - Trends in mean citation rates, 1990-2011 for fifteen of the currently most highly cited countries.



Source: (Karlsson & Persson, 2012)

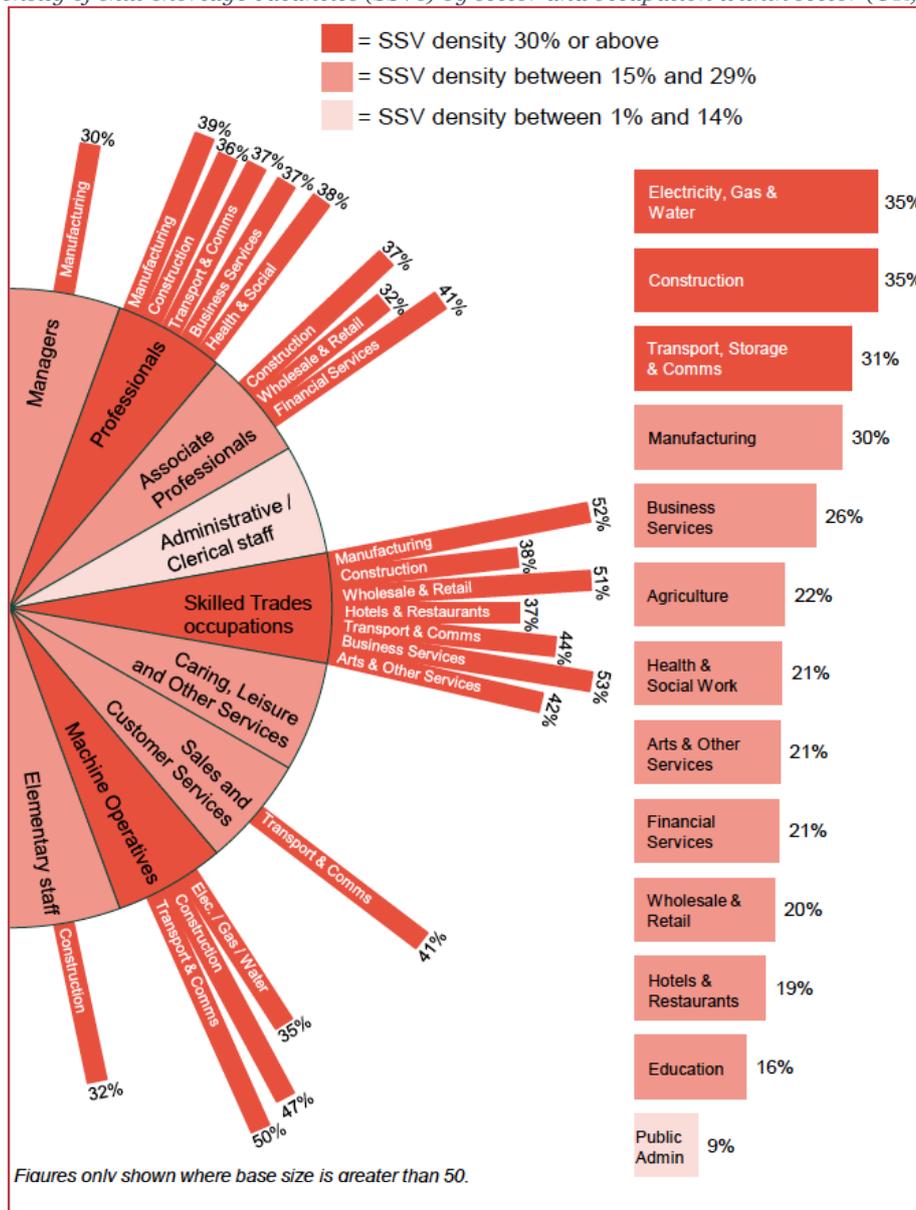
Figure 9 - Shares of internationally collaborative / domestically produced UK scientific publications over time



UK total and domestic research output of article and reviews in journals indexed on Thomson Reuters Web of Science™. The left hand axis is annual output where (i) the continuous black line refers to total and (ii) the blue shape refers to domestic output. The right hand axis refers to the percentage of total output that is domestic (has no international co-author) in each year (red line).

Source: Chart from Arnold et al. (2017) using data from Adams and Gurney (2016) based on Web of Science data.

Figure 10 - Density of skill-shortage vacancies (SSVs) by sector and occupation within sector (UK, 2015)



Source: UK Commission for Employment and Skills, 2018

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