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Foreword

Establishing a world-class Higher Education (HE) system and ensuring fair access to all is a key objective for the UK government, helping us ensure long-term, balanced and sustainable economic growth.

The direct benefits of higher education are clear: HE graduates are more likely to be employed and can expect to receive, on average, comfortably over £100,000 more over their lifetime (in present value terms) than those whose highest qualification is two or more A-levels. There are also considerable wider benefits, for example, through effects on health, social cohesion, civic engagement and social mobility.

The teaching and research activities of our Higher Education Institutions (HEIs) are recognised as being world-class, with surveys of international students showing that they are attracted to the UK by its reputation for high quality courses. However, there is strong competition from other countries and to remain competitive and sustainable, the UK needs to continue to adapt and reform its HE system.

As the number of students attending HEIs has increased in recent years, the current funding system has come under increased pressure. The graduate wage premium suggests a greater graduate contribution to the funding of HE is justified whilst retaining a strong incentive for individuals to invest in their own education. However, there remains a clear role for government to subsidise HE in the form of loans and grants to enable students from all backgrounds to participate.

The HE reforms, including lifting the fee cap, have the potential to enable greater investment, competition and innovation in HE. Price factors, including the provision of scholarships and bursaries, will play an increasingly important role in prospective students' choices. However, non-price factors will remain central, including aspects not only related to the quality of teaching and the value of qualifications in the workplace, but also the attractiveness of broader facilities such as ICT, libraries and accommodation.

This BIS Economics Paper provides the economic analysis underpinning the Government's Higher Education White Paper. This has been fundamental to policy design in striking the right balance between private and public funding, competition and regulation, and growth and social mobility.



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Executive Summary

This Economics Paper presents the underlying economic analysis and evidence that has informed the development of the Higher Education White Paper. It summarises a wide range of evidence and highlights the importance of a well-functioning higher education (HE) system. It aims to bring together in one place evidence and analysis relating to:

- The role of higher education in economic and social development of the country;
- The reasons why government intervenes in the market for higher education; and,
- The factors underlying behaviour and competition in the higher education market.

Introduction

The introduction provides a range of contextual information on the current higher education sector in England. Data and descriptions are presented on the number and size of Higher Education Institutions (HEIs), the current sources of income for institutions and recent trends in the number and status of students. It is clear that there is significant diversity in the sector – HEIs vary enormously in terms of their size, income and the students they admit.

- The largest one-third of HEIs account for two-thirds of all student enrolments. By contrast, fourteen HEIs had student populations of less than 1,000 each.
- The overall number of qualifiers has risen strongly since the mid-1990s; substantial growth has been seen amongst qualifiers from higher degrees whilst international student enrolments have also risen strongly.

In international terms, the performance of the UK's higher education system compared to other developed countries is mixed. The current stock of people with graduate qualifications in the UK is above the average for the OECD. However, the UK performs less well in measures which provide an indicator of the future trend of qualifications, and some other countries have had much stronger recent performance in terms of entry and graduation rates.

Economic growth

Higher education enhances the economy's stock of human capital which has the potential to generate economic growth through a number of channels. Highly educated individuals are more likely to be in employment and bring skills and abilities to the workplace that enable them to work more productively. They also facilitate innovation by helping to develop new products or process, or adapt existing ones, through their ability to draw on knowledge from the external environment. The UK Innovation Survey 2009 provides one illustration of this link with innovation active firms employing a greater share of graduates within the workforce than non innovation active firms.

Summaries of the empirical literature on the relationship between human capital and growth frequently report a positive link although the magnitude of the effect differs and it is not always possible to identify the precise mechanism through which human capital promotes growth. There is, however, more microeconomic evidence on the benefits that higher education creates for individuals as a result of improved labour market outcomes, for example:

- In Q4 2010, there was an 18.8 percentage point gap between the employment rate of those holding HE qualifications and those whose highest qualification was equivalent to two or more A-levels or below; and
- The discounted lifetime wage premium for an undergraduate degree is estimated to be over £100,000 compared to someone holding only two or more A-levels as their highest qualification.

The recession was found to have an impact on the employment rates of 2008 and 2009 graduates in the first year after they graduated. Longer-term, however, there are indications that the labour market prospects and earnings potential of graduates will remain strong. The wage premium for graduates has remained fairly stable since the mid-1990s suggesting that while the supply of graduates in the labour market has increased, there has also been an increase in demand. Globalisation and technological change are likely to continue to create a demand for highly skilled individuals in the UK, providing opportunities and benefits for those investing in higher education.

Wider Benefits

The third chapter looks further at the non-market impacts of higher education. Although there are some measurement challenges, evidence suggests there are a range of wider benefits to individuals and society beyond economic growth considerations. Higher education, along with education and skills more generally, has been shown to contribute favourably towards civic engagement and tolerant attitudes.

- A UK longitudinal study shows individuals with degree-level qualifications are more likely to have been a member of a charitable organisation and are more likely to vote than similar individuals educated to lower levels.

Higher education has also been shown to have a beneficial effect on health and healthy behaviour, and changes in parenting behaviour. The exact mechanism by which these effects occur is unclear, but there is evidence to suggest that graduates care more about future outcomes and adjust their behaviour accordingly.

- Controlling for smoking behaviour at age 16, non-graduates educated to level 3 are around 50% more likely than graduates with similar personal characteristics to be a smoker at age thirty.

Some of these wider benefits accrue to the individual undertaking higher education (or their family) but many are externalities, benefiting society more widely. There is

some evidence to suggest that non-market benefits are substantial and potentially of comparable magnitude to the private wage benefits of HE. However, determining more accurately the overall size of non-market benefits and whether, on average, it is individuals or society who capture most of the benefit requires further academic work.

Social Mobility

Chapter 4 provides an overview of the evidence around social mobility, highlighting the importance of higher education as a driver of mobility and reviewing the progress in widening participation that has been made over recent years. While the evidence is complex, the UK appears to have relatively low levels of social mobility by international standards and to have experienced static (or possibly falling) levels of mobility for generations born since the late 1950s. A variety of personal, environmental and economic factors interact to influence the level of social mobility, but higher education is recognised as an important driver.

Prior attainment is identified as the most important factor in determining whether a young person participates in HE, though there are some unexplained differences between the participation rates of different groups. Over the past 15 years and particularly during the last five, good progress has been made both in increasing participation in HE and in reducing the gap between the participation rates of the least and most disadvantaged young people:

- Over the period 1994/5 to 2009/10, HE participation by young people has risen from 30% to an estimated 36% - an increase of 22%; and,
- Over the same period, HE participation of young people in the most disadvantaged areas has increase from 13% to 19% - an increase of 51%.

This period saw significant improvements in attainment levels in schools and expansion of the number of students in HE. However, a substantial gap still remains, with the least disadvantaged young people still around three times more likely to participate in HE.

While good progress has been made in widening participation to HE in general, this has not been reflected in institutions with the highest entry tariffs, where the benefits to study appear to be greatest. Over the last 15 years, while the participation rate of the most disadvantaged young people in the lowest third by entry tariff institutions has increased from 5.2% to 7.8%, their participation in the top third by entry tariff has remained at 2.7%. Again, prior attainment is a key factor, but research has identified that young people from state schools are much less likely to apply to higher tariff institutions than their equivalently qualified peers from independent schools.

Role for Government

Chapter 5 explores the reasons why governments intervene in the market for higher education and the characteristics of an efficient HE system. There are two primary market failures present in higher education – imperfect information and positive externalities. Imperfect information can arise for a number of reasons:

- Despite an average wage premium, graduates are uncertain of their own future earnings. Evidence from Canada suggests prospective students overestimate the costs of a degree and underestimate the amount of support available and the future benefits they will receive.
- Imperfect information in the credit market, leading to adverse selection and moral hazard. This means purely private student loan providers would not provide full, equitable coverage.
- Uncertainty amongst students about courses and institutions. There is evidence that information, advice and guidance relating to higher education could be improved – a significant number of students report they needed more assistance with their choices.

Without some intervention by governments, these market failures would lead to too little public and private investment and too few students attending HE. Certain groups of prospective students, such as those from poorer backgrounds, would be disproportionately affected because of higher risk aversion and greater information barriers.

There is no single approach taken internationally to overcome market failures – international comparisons show a range of public expenditure in HE and many different approaches to student support. This partly relates to the fact that measuring the externalities from higher education, especially by group, is intrinsically difficult so the optimal outcome is not always known. In the case of the UK, the chapter argues that there is potential for higher student contributions, combined with a well-developed system of income-contingent loans and grants, to improve the equity of the HE funding system in a way that is also consistent with economic efficiency. Hence there is a case for rebalancing funding of HE in the interests of long-term sustainability.

Behaviour in the HE system

The final chapter looks at the HE system, and the dynamics between the different participants. The provision of HE in England is characterised by a large and diverse community of institutions and students, with an active role for government and (growing) interest and involvement from employers. While not operating as a perfect market, there are elements of market dynamics influencing behaviour in the system. There are also a number of structural features which support this, with many suppliers, a large customer base, defined products, and consumer choice (subject to constraints such as entry requirements, number of places – at each HEI as well as the total in the system – and being offered a place by the HEI).

Student behaviour is an important factor for supporting good outcomes from HE, and ensuring that they have the right information to be able to make good choices about their participation in HE is central to this. There is evidence that price also has an impact on participation in HE, and the response from students to the change in price will act as a constraint on the prices set by HEIs, in addition to the fee caps set by government. However, there is some uncertainty about how much HE may be

influenced by the Veblen-effect where price is a signal of quality, and students view higher prices as a signal of quality or prestige. In addition, the impact of price cannot be considered in isolation to the student support available which has previously had an important offsetting-effect.

Competition between HEIs is largely defined through non-price factors, particularly around quality, reputation and the 'total offer' (such as broader facilities). While price competition has been limited to date, the increase in the fee cap means that HEIs need to identify new fee levels, taking into account a range of factors, including decisions on levels of investment, and student response to prices. In addition to the headline fee levels, HEIs will also be able to offer scholarships and bursaries, additional to the National Scholarship Programme.

The changes in the White Paper will impact on both students and HEIs, affecting their behaviour individually, as well as the dynamics between them.

Conclusions

Higher Education involves a number of diverse groups in society – from individuals directly involved as students, then beneficiaries as graduates, to HEIs as providers, business and the government – with the benefits spreading out more widely throughout the economy and society more generally. The success of HE in generating benefits and contributing towards economic growth and social mobility goals depends on the interactions between all participants, and their responses to each other's choices and behaviours.

1. Introduction

Summary

This chapter presents a brief description of Higher Education Institutions (HEIs) in England. In October 2010, there were 131 HEIs in England, 89 of which were universities. The mean number of students enrolled per institution is 16,000 although there is considerable variation, with the largest one-third of HEIs accounting for two-thirds of students. Similarly, there is variation by income with 33 HEIs earning over £200m and the smallest 25% of HEs accounting for just 3% of total income. Although 87% of the two million students at English HEIs are from the UK and EU, the UK attracts 10% of all international students, second only to the US, with a reputation for high quality courses. International comparisons of HE indicators suggest that although the UK performs above the OECD average in terms of the proportion of individuals with higher education, other countries have expanded at a relatively fast rate in recent years.

Higher Education Institutions in England

As of October 2010, there were 131 Higher Education Institutions in England supported by some form of direct government support.¹ Of these, 89 were universities.^{2,3}

Figure 1 shows the number of students enrolled in each HEI in 2009/10. The mean number of students enrolled per institution was around 16,000.⁴ There is, however, substantial variation in the size of HEIs, ranging from a number of small specialist institutions (such as the Royal College of Music) to large city universities offering a broad range of subjects and facilities (such as the University of Manchester). The Open University has the largest number of students enrolled, with a total of 210,000 in 2009/10.

The largest one-third of HEIs account for two-thirds of all student enrolments. By contrast, fourteen HEIs had student populations of less than 1,000 each, meaning the smallest 10% of institutions accounted for less than 0.5% of the student population in England.

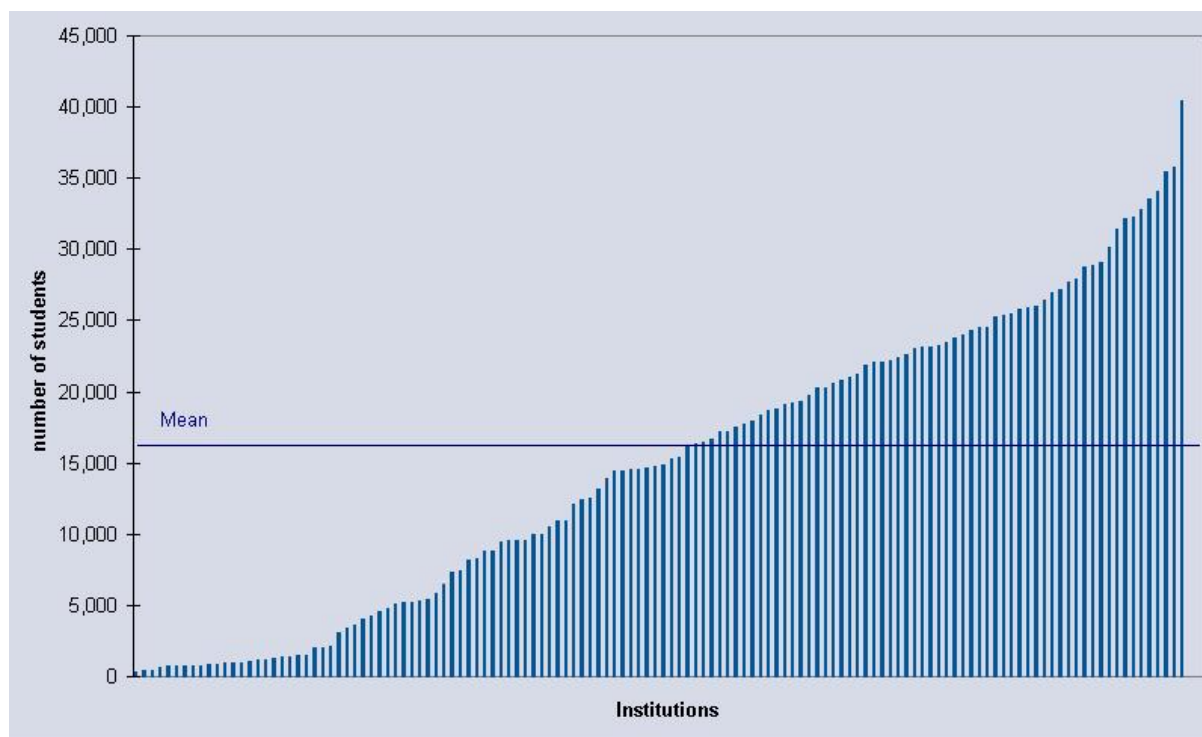
¹ This includes some private institutions which benefit from some form of government funding, either through support for students on their courses or research funding.

² Universities UK (2010).

³ Institutions with university in the title, awarded by QAA.

⁴ HESA (2011).

Figure 1: Total students enrolled by English Higher Education Institution (excluding Open University), 2009/10



Source: HESA 2011. The Open University had around 210,000 enrolments in the same year.

The majority of HEIs in England are publicly-funded, not-for-profit charities.⁵ The main changes in the number of publicly-funded HEIs in England in recent years have been the result of changes in legislation – mainly through the Education Reform Act 1988 and the Higher Education Act 1992. This has increased the diversity of publicly-funded provision, although HEIs are sometimes considered to be part of one of two broad categories – pre-1992s and post-1992s. The post-1992 group is largely made up of former polytechnics and colleges of higher education which gained university status from the changes in legislation. There are many more narrowly defined groups of HEIs, however, such as teacher training colleges, universities established in the 1960s and 1970s, specialist institutions, as well as civic and ancient institutions.

Further Education Colleges (FECs) in England also deliver higher education courses.⁶ These courses can be funded directly from the Higher Education Funding Council for England (HEFCE), via the Development Fund for Learning and Teaching, or indirectly via a HEI.

In 2008/09, 5.3% of all higher education courses in England were provided within FECs. In the same year, around 112,000 full person equivalents were enrolled in HEFCE-funded HE courses in English FECs. However, this represents a decrease

⁵ Note these institutions are technically classified as being in the private sector even though the majority are publicly funded. Private institutions in this paper are defined as those who are not predominantly publicly funded.

⁶ As defined under the HEFCE/QAA quality assurance framework.

of 25% since 2002/03,⁷ which can be partly explained by changes in the classification of courses and registration of students, and a fall in the number of FECs providing HE courses.

In addition, there are a small but growing number of private providers active in the provision of higher education in England. These institutions typically offer a range of qualifications besides degree-level awards, but there tends to be a more restricted subject choice. Institutions range from those with UK degree awarding powers⁸ or accreditation from a recognised UK awarding body,⁹ to overseas universities with UK campuses and smaller private colleges targeting international students for degree-level study. In addition, Universities UK (2010) has identified a growing number of private institutions providing foundation and pre-degree courses,¹⁰ and the Higher Education Policy Institute (2011) notes a potentially large number of colleges that have been validated by UK HEIs to award their degrees.

A HESA survey of private and for-profit providers of higher education¹¹ indicates there were around 38,000 students on higher education courses (across the UK) at a total 65 institutions in 2009/10. The majority (around 80%) of these students were studying business, management or law courses. Private, not-for-profit companies or charities accounted for the largest number of students although for-profit companies also play a role. Most institutions were small with the median number of students being around 160.

Sources of funding and activities of HEIs

Each HEI is responsible for the teaching of their students and most also undertake academic research. The balance of resources universities devote to these two main categories of activity varies by institution. For instance, research funding is highly skewed towards a small number of institutions; in the past around thirty percent of HEIs have had less than 2% of their funding council income allocated for research,¹² far below the institutional average.

The nature of teaching and research is also heterogeneous – within teaching activities, for example, HEIs can provide various subjects, courses and units (and factors such as curriculum and assessment processes mean even courses in the same subject differ). There are also different levels of qualification (from foundation and first degrees to PhDs¹³) and intensity of teaching (part-time or full-time). The majority of institutions offer a mix of both undergraduate and postgraduate qualifications, with only a few exceptions - HESA data shows six HEIs had no

⁷ Learning and Skills Council's Individualised Learner Record (F05 and L05).

⁸ There are currently five private providers with degree awarding powers: BPP University College of Professional Studies Ltd, University of Buckingham, The College of Law, Ashridge Business School and ifs School of Finance.

⁹ Specific courses offered by private providers may be accredited by UK awarding bodies, such as universities, to award recognised degrees in the UK.

¹⁰ Universities UK (2010).

¹¹ HESA (2011a). Not adjusted for non-response.

¹² HEFCE (2003). Does not include other sources of research income e.g. industry.

¹³ Degree awarding powers are granted by either a Royal Charter, Act of Parliament or the Privy Council. Degree awarding powers cover the various levels from Foundation Degrees, Taught Degrees and Research Degrees.

undergraduate students in 2009/10 and only one HEI had no postgraduate students.¹⁴

In addition to these core activities, HEIs provide a range of facilities to students. Some of these directly support the teaching of students (such as libraries and ICT), but others include ancillary activities such as accommodation, catering and sports facilities. These factors are important as they form part of the whole package that an institution can offer prospective students and therefore students' decisions on which HEI to attend. HEIs also engage in other commercial activities from their estates, such as the provision of conference facilities.

Sources of funding

Government funding for HE **teaching** activities in England has, to date, been largely provided to publicly-funded HEIs on a formula basis administered by HEFCE. While this form of direct support has provided a large element of funding to HEIs until now, it will provide a smaller proportion of direct funding of HEIs in the future. The current funding formula takes into account a range of factors including:

- The number of students and the courses they are taking (to allow for higher costs associated with expensive technology or laboratory equipment);
- The costs associated with attracting disadvantaged students; and,
- The type of institution and location (for instance specialist institutions and those in London may face higher operating costs).

These factors are used to determine a single block grant to individual institutions for the purposes of learning and teaching. HEFCE allocated a total of £4,675 million for teaching in 2010/11. These funds are distributed subject to a funding agreement between the HEI and HEFCE, which includes targets relating to student numbers and other general requirements. The HEFCE teaching grant is mainly focused on undergraduate student places as it is assumed that most postgraduate courses will charge higher tuition fees to make up the cost of delivering the course.¹⁵ Non-EU student places are not covered by public funding.¹⁶

While the majority of funding for student places under the HEFCE teaching grant follows the student, there are some constraints to how freely that funding can flow between courses and HEIs, at least in the short term. Although HEIs have autonomy in how they internally allocate their learning and teaching funds, these constraints effectively fix the number of funded student places HEIs are able to offer. Any switching of resource within a university to allocate more places on a course will normally mean reducing the number of places available on another course. In addition, HEIs will also have some capacity constraints of their own that will limit their

¹⁴ HESA (2011).

¹⁵ Postgraduate research places are funded from research grants.

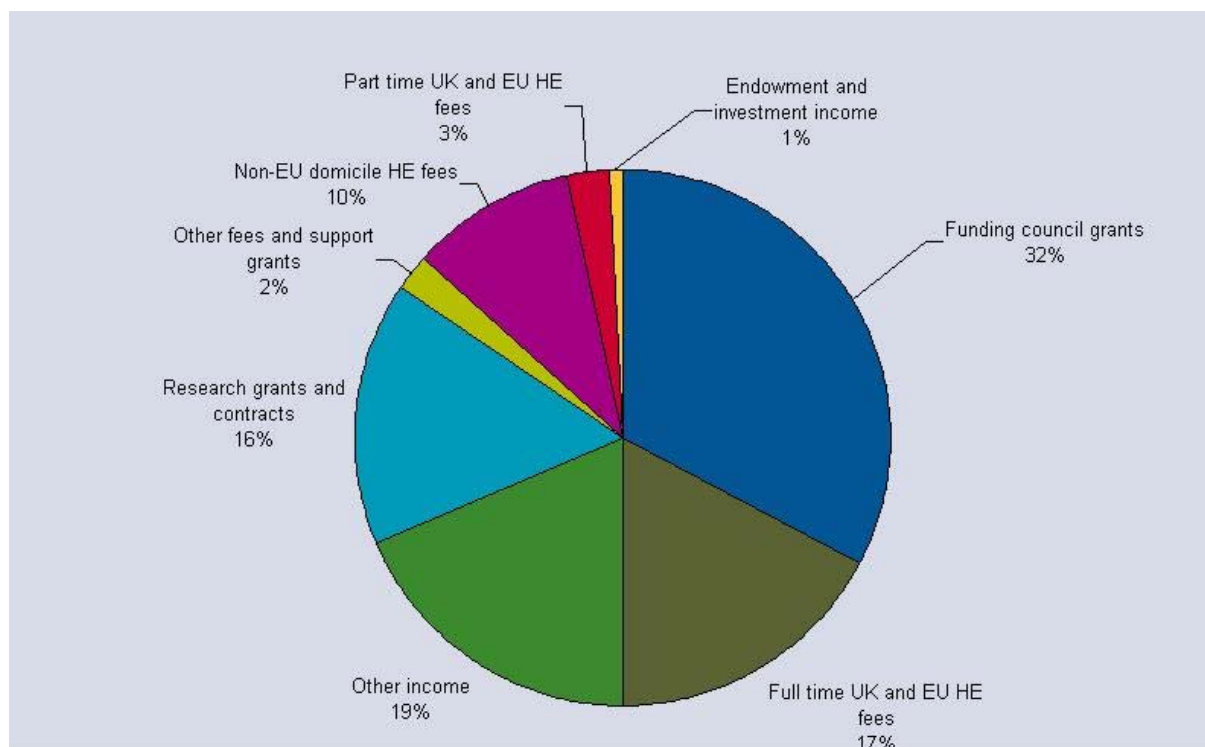
¹⁶ More detail in HEFCE (2010).

ability to offer more places in the short-run (for example teaching accommodation, including lecture halls and laboratories).

An alternative student funding arrangement is for employers to co-fund a student place. In 2009/10, there were 19,800 co-funded students at 93 HEIs. Employer co-funded places provide funding in two parts – the top-up from the employer to co-fund the teaching grant element provided by HEFCE and the student fees (which may also be paid by the employer rather than the student in some cases).¹⁷ Many students, e.g. those studying part-time, may receive less formal support from their employers.

Government funding for **research** is made available via two routes: HEFCE quality-related research grants (block grants awarded to institutions on the basis of recent research performance, as assessed by the Research Assessment Exercise every 5 years¹⁸); and the seven Research Councils¹⁹ (via competitively awarded grants for specific scientific projects). Competition for research funding is intense – institutions face incentives to increase their focus on excellence and impact to win more funds from these funding streams, as well as from interactions with business. The amount and performance of research activity also contributes to the reputation of a HEI, influencing the ability to attract high quality academics as well as students.

Figure 2: Sources of Income for HEIs in England, 2009/10



Source: HESA (2011): Finance plus 2007/08, tables 5b.

¹⁷ HEFCE is currently developing a programme for co-investment in HE with employers. Co-funding rates from employers are expected to be 50-75%.

¹⁸ More detail at www.rae.ac.uk.

¹⁹ More details at www.rcuk.ac.uk.

The primary sources of public funding for HEIs, funding council allocations for research and teaching, are reflected in the overall composition of income, as shown in Figure 2. As the figure shows, however, there are other major sources of income apart from the government.

Most notably, international, home and other EU students pay tuition fees directly to HEIs. Fees are levied at varying levels but subject to a government regulated cap of £3,290 in 2010/11 (although part-time fees are currently unregulated). In this sense part of an institution's income is directly linked to the student. Domestic students (defined as UK, rather than just England) are able to access loans administered by the Student Loans Company (SLC) for which graduates subsequently make income-contingent repayments. There are also government funds available to students for maintenance, in the form of a student loan system and means-tested grants. The postgraduate student support system is currently limited to means-tested fee grants, whilst non-EU international students are responsible for their own fees and maintenance funding.

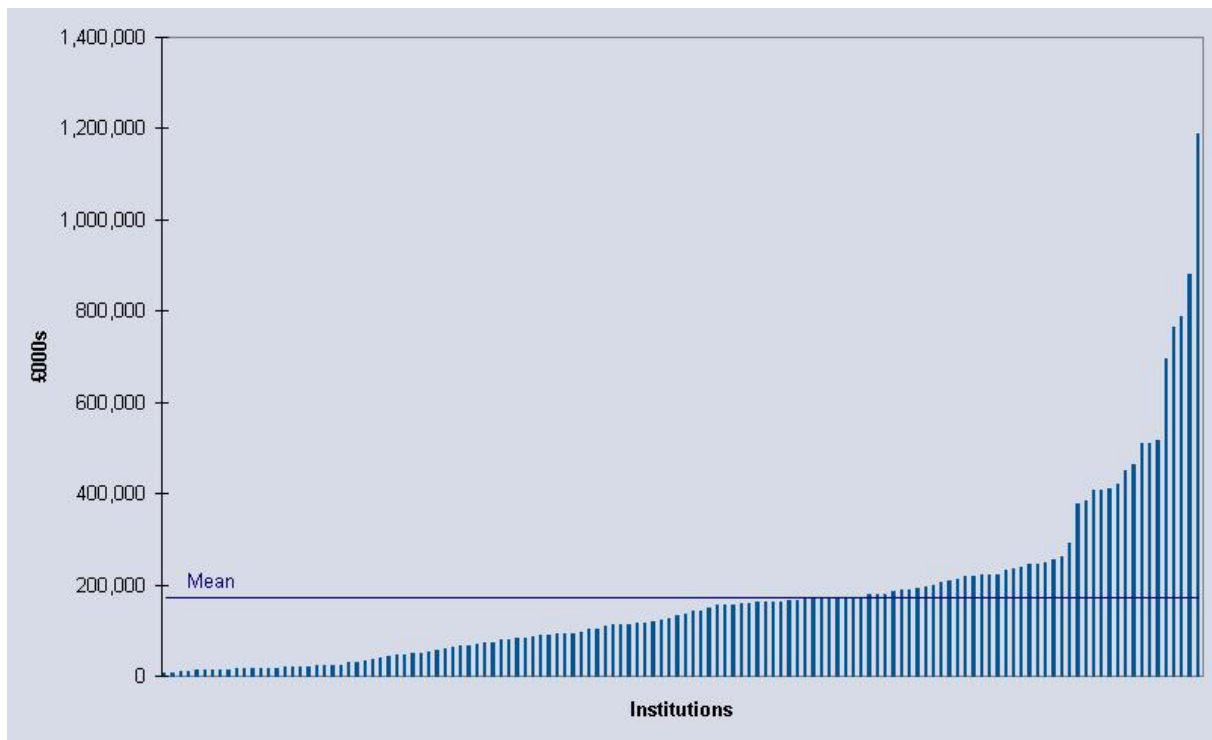
Student support from the government is available to eligible students attending publicly-funded HEIs, as well as specific courses provided by private HEIs which are individually designated to attract student support. The latter set of courses, however, represent a small proportion of the total students accessing student support; in academic year 2009/10 the SLC approved 935,000 individual applications,²⁰ of which 4,440²¹ (less than 0.5 per cent) were for students attending private HEIs.²²

Overall, reflecting the variation in institutional size and the amount of research conducted, there are considerable differences in the income of institutions across the English higher education sector, as shown in Figure 3. In 2009/10, thirty-three HEIs in England had income of £200m or more, and 44% of HEIs accounted for 78% of total income. By contrast, thirty-two HEIs earned less than £50m in 2009/10. The smallest 25% of English HEIs accounted for just 3% of income.

²⁰ BIS/SLC (2010).

²¹ SLC management information.

²² 87 private HEIs have courses which are eligible for student support.

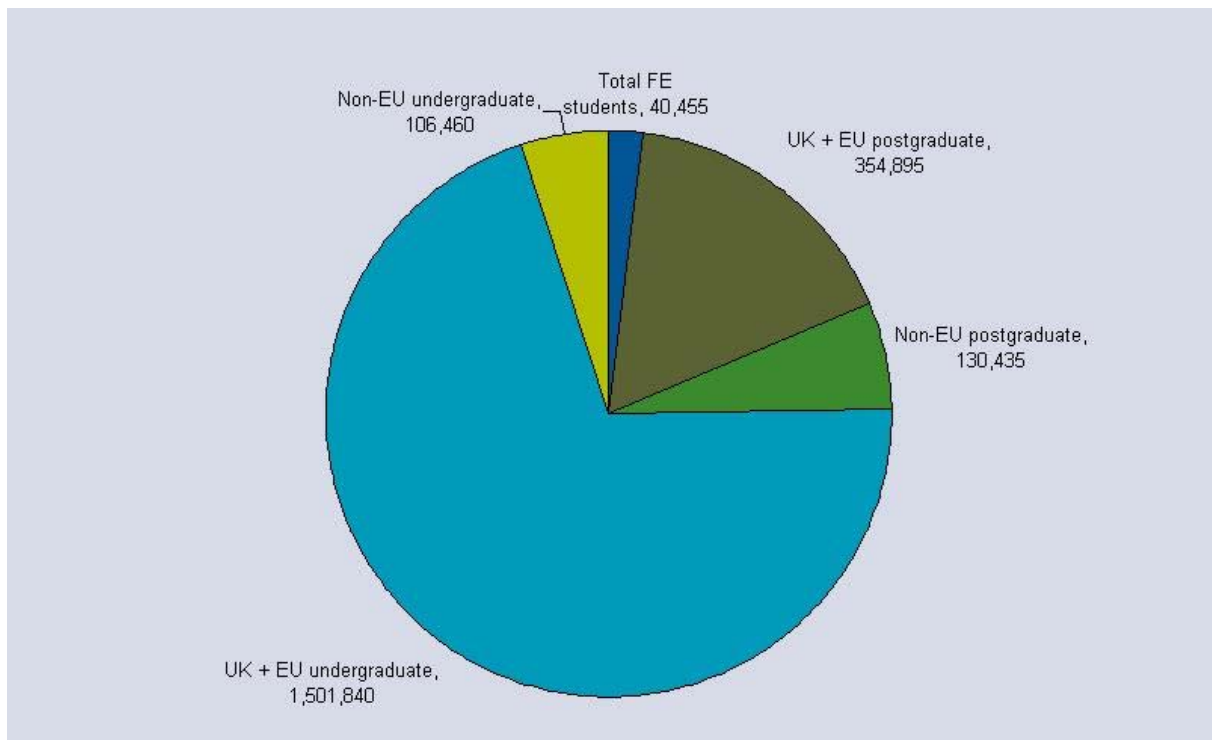
Figure 3: Distribution of HEI incomes in England, 2009/10

Source: HESA (2011)

Students

As of October 2010, there were over two million students on courses in HEIs in England. The majority of students are domestic undergraduates – 70% of the student population are UK or EU-domiciled full or part-time students at this level. The remainder of students are domestic postgraduates and international students at both undergraduate and postgraduate levels.²³ Around 30% of all undergraduates study part-time, whilst there is a roughly equal split between full-time and part-time postgraduates.

²³ This includes those with some form of government funding (including the University of Buckingham), but not those private institutions, for which data is not available.

Figure 4: Students in English HEIs by course type and domicile, 2009/10

Source: HESA (2011)

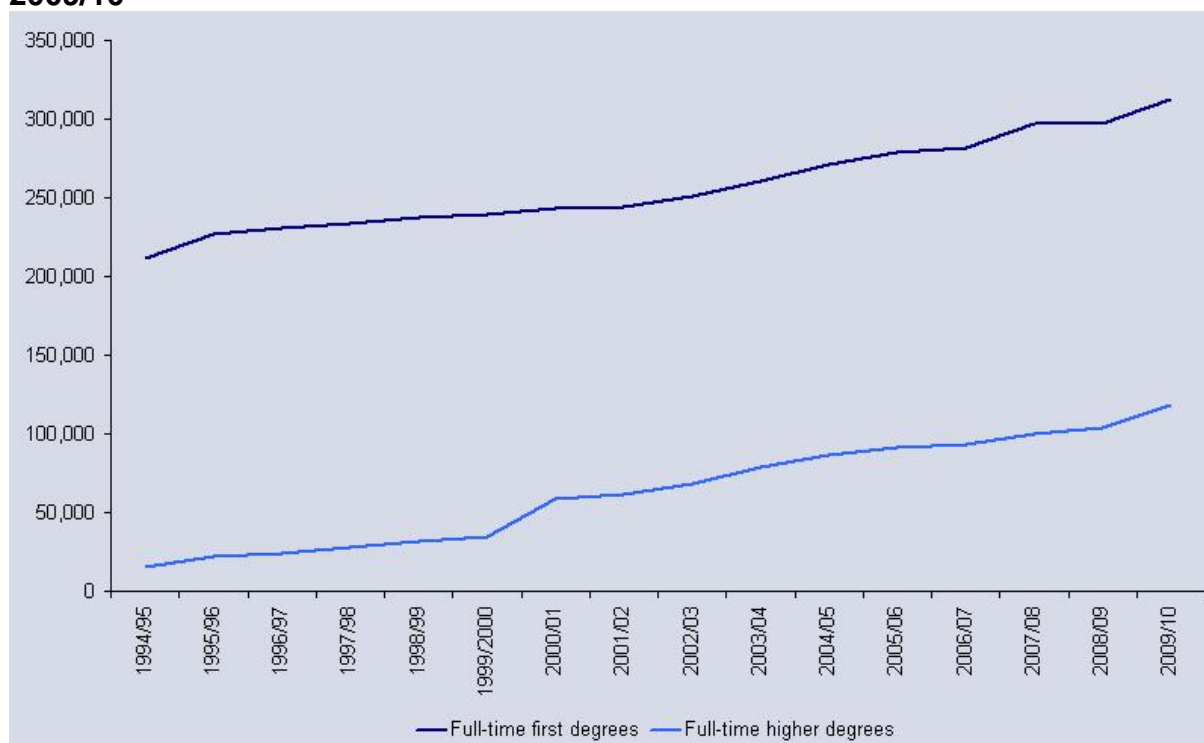
There is some variation in characteristics and mode of study according to where students study. A large proportion of students in FECs study part-time (75% of undergraduates and 88% of postgraduates in 2008/09 compared to 37% of HE students overall) and are mature students (78% of undergraduate students in FECs were aged 21 and over, and 86% of postgraduates were aged 25 and over in 2008/09 compared to 21% and 43% respectively for all students).

In terms of the number of individuals qualifying from HEIs, Figure 5 shows that the number of qualifiers from UK universities²⁴ has risen strongly since the mid-1990s. Between 1994/95 and 2009/10 there was a 47.5% increase in the number of first degree qualifiers. During this time, full-time and part-time qualifications grew at the same rate.

Postgraduate qualifications have risen proportionately much faster over the same period – there were over three times as many higher degrees awarded in the UK in 2009/10 compared to fifteen years earlier (Figure 5). Within this there has been a proportionate shift towards more full-time postgraduate qualifications which have risen over sevenfold during the same period. The larger overall increase has come from ‘other’ postgraduate qualifications, including Masters courses, although doctorates have also risen strongly.

²⁴ Data on the number of qualifiers is available only at the UK level.

Figure 5: Trends in all student qualifiers in the United Kingdom, 1994/95 – 2009/10



Source: HESA (2011)

International and transnational education

Surveys of students show that, with the exception of the US, the UK is the most attractive study destination for students. Both the US and the UK rank very highly in terms of the reputation of HE qualifications, although both are considered to be high-cost countries.²⁵ Satisfaction levels amongst international students of UK HE have also increased over time reflecting the strong learning experience provided and continuing to encourage international students to study in the UK.²⁶

In 2008, the UK attracted 10% of all international students (second only to the US at almost 19%).²⁷ Students from China and India form the largest component of non-EU students, accounting for almost one-third of the total.²⁸ As a consequence, the fee income that UK HEIs receive from non-EU students has increased from £746 million to £2,580 million over the same period (Figure 6).

²⁵ British Council (2006).

²⁶ i-Graduate International Student Barometer (2010).

²⁷ OECD (2010a).

²⁸ Students in Higher Education Institutions 2008/09, HESA (2010).

Figure 6: Income from non-EU students and number of non-EU enrolments in UK HEIs, 2000/01 to 2009/10



Source: HESA (2010) and Universities UK (2009)

In addition, the Erasmus programme offers the opportunity for students to study for a part of their degree programme in another EU university. With an inward flow of 16,000 students in 2008/09, the UK had the fourth largest intake of Erasmus students behind Spain, France and Germany. In terms of outflows, 7,000 UK students studied abroad on the Erasmus programme in 2008/09, making the UK the 6th largest participating country.²⁹

Economic impact of higher education and international students

Universities UK (2009a) use ONS data to construct an input-output model, combined with a range of other data sources relating to universities, employment and student expenditure to estimate the contribution made by the HE sector to the UK economy. This modelling approach enables the direct effect of universities on the economy to be estimated, as well as the indirect effect arising from the supply chain impact of university expenditure on other sectors of the economy. There is also an induced effect stemming from university staff consumption. The results provide estimates of the impact of HE on a range of measures including output, employment, export earnings and GDP in 2007/08:

²⁹ European Commission (2010).

- In terms of gross output, including multiplier effects³⁰ on other sectors of the economy, HEIs accounted for £59 billion of output;³¹
- HEIs directly employ around 314,000 full time equivalents with a further 324,000 UK jobs being dependent on universities;
- The expenditure of international students and visitors generated £5.3 billion in export earnings; and,
- For gross value added, universities accounted for over £31 billion to national GDP as a result of both direct and indirect effects.

Using analysis of similar data sources, HEPI (2007) examine the economic costs and benefits of international students. The report estimates international students provided a direct injection of around £1.4 billion in 2007 (in 2005 prices) into the UK economy from tuition fees. Further expenditure on factors such as living costs and leisure is estimated at £2.3 billion. According to the report, this would rank higher education as a major export sector, comparable in size to the media and cultural sectors. International students who stay on in the UK after graduation provide further economic and labour market benefits.

International comparisons of higher education

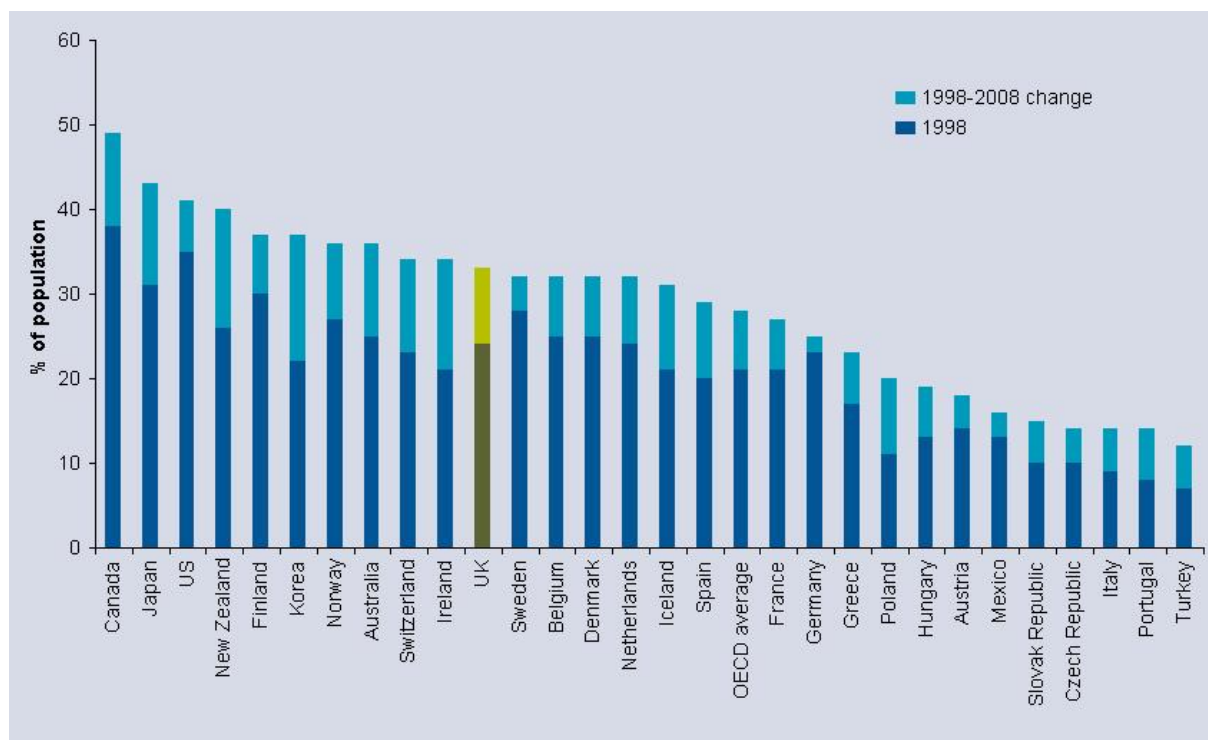
The OECD's Education at a Glance 2010 provides the latest comprehensive international comparisons across a range of indicators including the individuals who participate in education, how much countries spend on differing levels of education, and outcome measures such as qualifications obtained and labour market earnings.

In 2008, 33% of those aged 25-64 in the UK held tertiary qualifications as their highest educational attainment (Figure 7). This is above the OECD average of 28%, but the UK remains behind high performing countries like Canada, Japan and the US, where over 40% are educated to this level.

³⁰ Note estimates of multipliers are always subject to uncertainty, particularly for induced effects, and are generally not included within Green Book style appraisals.

³¹ The UUK analysis provides an estimate of gross impacts and does not include an analysis of the counterfactual.

Figure 7: Percentage of population aged 25-64 holding tertiary education ranked by attainment in 2008

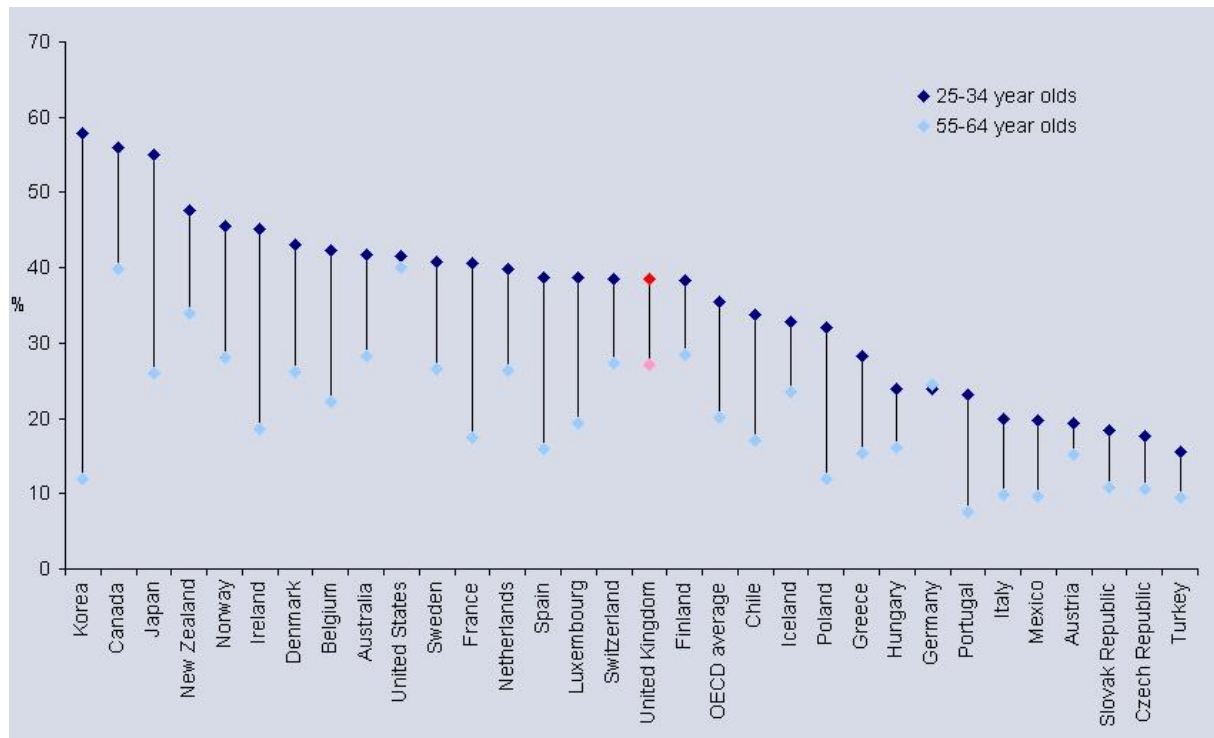


Source: OECD Education at a Glance 2010

In addition to the *stock* of graduate-level qualifications amongst the population, the OECD also present indicators that relate more to the *flow* of people gaining tertiary level qualifications. Figure 8 reports the percentage of the population aged 25-34 who hold tertiary qualifications compared to those in the 55-64 age group. This comparison gives an indication of the relative improvement in attainment of younger individuals compared to those close to retirement age and thus the extent to which overall attainment of the working age population may be expected to increase in future.

Korea has the highest level of tertiary attainment amongst 25-34 year olds at 58% and has the largest gap between 25-34 and 55-64 year olds of 46 percentage points. The UK is similar to the OECD average with 38% of 25-34 year olds holding graduate qualifications – 11 percentage points higher than 55-64 year olds. However, the UK's international ranking is lower for 25-34 year olds than older workers.

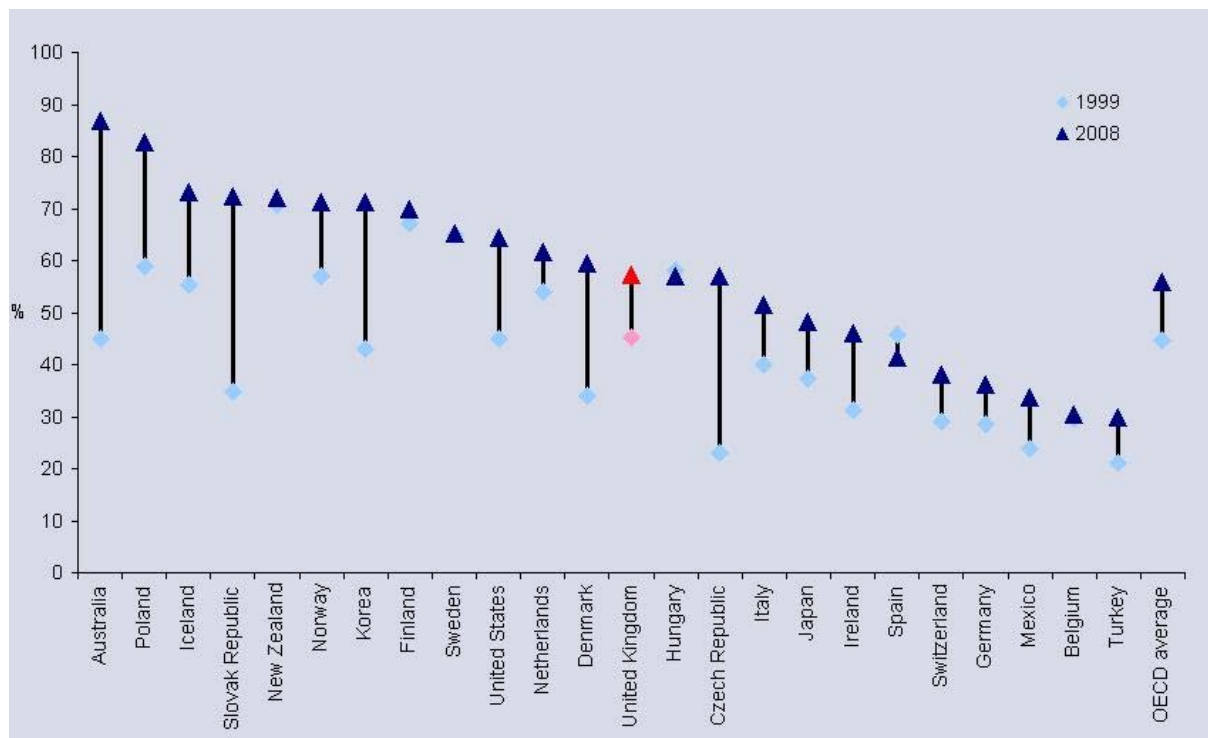
Figure 8: Percentage of population aged 25-34 and 55-64 with tertiary education (2008), ranked by attainment of 25-34 year olds



Source: OECD Education at a Glance 2010

As an alternative measure of the future flow, Figure 9 shows entry rates in to tertiary education, expressed as a percentage of the age cohort. Over time, the UK has remained close to the OECD average, with the rate growing from 45% in 1999 to 57% in 2008. Some countries, including Australia, Korea and the United States, which started at a similar level to the UK in 1999, expanded at a faster rate over the following decade. Others such as Denmark and the Slovak Republic have overtaken the UK over the same period.

Figure 9: Entry rates into tertiary-type A education in 1999 and 2008 by country, ranked by 2008 entry rates



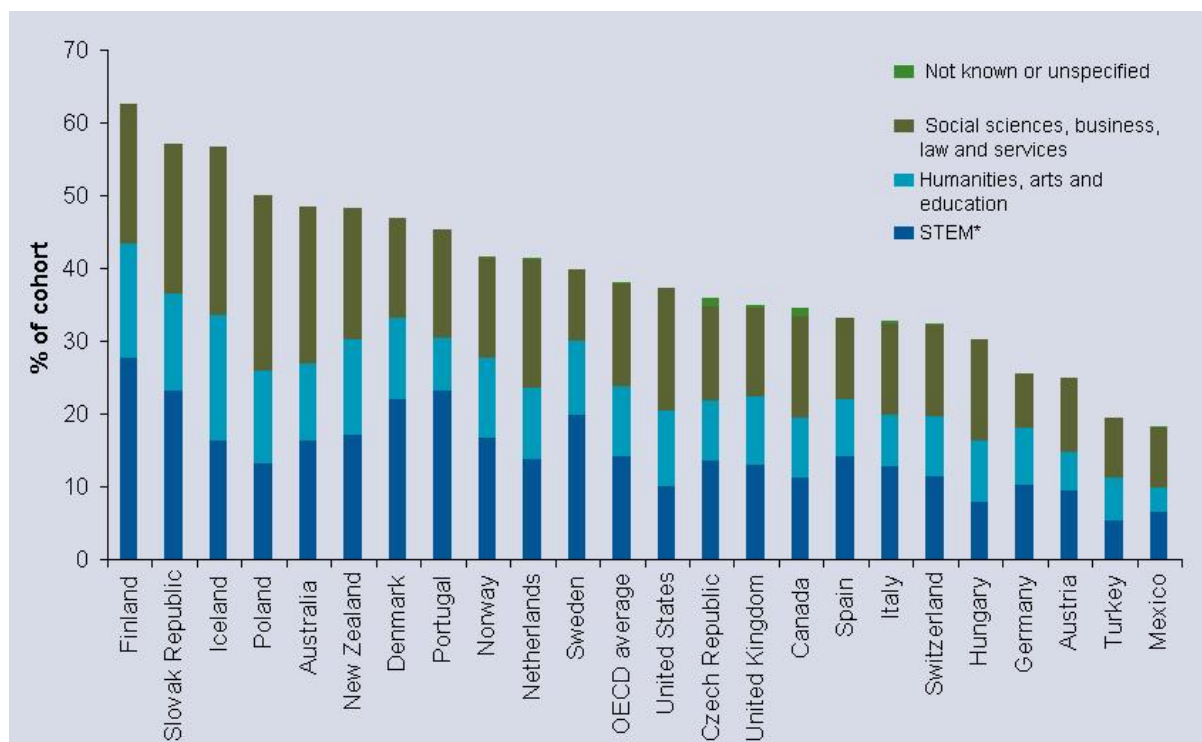
Source: OECD Education at a Glance 2010

Notes: Entry rates represent the proportion of people in an age cohort who enter tertiary-type A education. The rates presented are sums of net entry rates for all ages, representing an estimate of the probability that a young person will enter tertiary education in his/her lifetime if current age-specific entry rates continue. This method eradicates differences stemming from differences in the typical starting age of tertiary education. To maximise observations, the figures shown are unadjusted for international students; this affects the figures – Australia, for example, would lose its position if international students were excluded.

Figure 10 presents the proportion of individuals graduating by country. Here the UK is below the OECD average and significantly behind leading countries such as Finland, New Zealand, Australia and Denmark but has a more favourable performance against the US, Canada and Germany.

Figure 10 also illustrates the proportion of graduates by broad subject areas. For the UK, 37% of graduations are in STEM subjects with a further 27% in humanities, arts and education, and 35% in social sciences, business and law.

Figure 10: Tertiary-type A graduation rates by country and broad area of subject studied



Source: OECD Education at a Glance 2010. * STEM includes health and welfare; life sciences, physical sciences and agriculture; mathematics and computer science; and engineering, manufacturing and construction.

Type A programmes have a minimum duration of three years and are designed to enable entry into advanced research programmes and professions with high skill requirements (e.g. Bachelors/first degrees in the UK).

Type B programmes are shorter than type A (minimum of two years full-time equivalent) and provide practical, technical or occupation skills for entry to the labour market. In the UK, 15.8% of individuals graduate with these programmes (compared to an OECD average of 9.8%) with 53.3% being in STEM (with an OECD average of 37.5% (e.g. Foundation Degrees and HNDs in the UK).

Overall, therefore, the international comparisons of UK performance present a mixed picture. Although the current stock of graduate qualifications indicates the UK is above the OECD average, some other countries have much stronger recent performance in terms of entry and graduation rates.

This overview provides the context for the analysis contained within the rest of this Economics Paper. Chapters 2, 3 and 4 examine the evidence of the importance of higher education in supporting economic growth and achieving broader social objectives. Chapters 5 and 6 examine the HE system in England, assessing the role of government and gaining an understanding of what is driving behaviour in the sector.

2. Higher Education and Growth

Summary

Higher Education is important to growth through equipping individuals with skills that enhance their productivity in the workplace, promoting the economy's knowledge base and driving innovation. Research shows that graduate-level qualifications provide benefits to the economy in terms of growth and offer significant returns to individuals in the form of higher wages and improved employment prospects. These wage returns have remained stable over time as the supply of graduates has expanded. Globalisation and technological change are likely to continue to drive demand for high level skills in the future.

Introduction

Economic growth, defined in terms of the ability of an economy to expand the potential supply and consumption of goods and services over the long-term, is important for raising social welfare. Between 1990 and 2008, average annual GDP growth in the UK stood at 2.3%, with Canada and the US being the only G7 countries to grow at a faster rate. Following the longest and deepest post-war recession, it became evident that UK growth had become unbalanced with an over-reliance on public and private debt, while the contributions to growth from business investment and net trade declined.³² The Government's core economic objective is to restore the economy to long-term sustainable growth.

One of the central pillars through which Government aims to secure sustainable growth is by supporting individuals to fulfil their potential. Within the knowledge economy, individuals' skills and talents are a valuable asset and for growth to be sustainable and balanced, everyone should have the opportunity to contribute. Government has a role to play in enabling this through investment in the education and skills system and by promoting a labour market that rewards work and encourages people to access the opportunities available to them.

Higher education is a vital component of the overall education and skills system, opening up new opportunities to individuals in the labour market, promoting fairness and helping to achieve economic growth. This chapter presents the evidence relating to the contribution that HE makes to economic growth and the mechanisms through which this occurs. The literature linking HE to growth is divided into three main sections. Firstly, there is a large theoretical and empirical literature that explores the relationship between human capital – which includes higher education – and measures of **national economic growth** such as GDP per head. This research has

³² BIS Economics Paper No. 9 'Economic Growth' contains a full discussion of UK growth performance across a range of measures.

evolved over time with new insights being offered for understanding how highly skilled people in an economy or region facilitate economic growth.

Secondly, since they are able to capture some of the benefits from growth, there are substantial **economic returns to graduates** arising from improved employment probabilities and labour market earnings (which serve as a proxy for productivity). The latest research indicates a discounted graduate lifetime premium of over £100,000 in today's money and after taxes, suggesting that there remains a strong incentive for individuals to invest in their own education.

Thirdly, there are a range of **benefits to employers** from graduates, who are able to generate new ideas, transfer knowledge and promote innovation. In some cases, there is a challenge to employers in integrating graduates into wider business strategies and being able to make the most effective use of skills to maximise the benefits.

The final section of the chapter explores the **future drivers of demand for higher education graduates** to assess the extent to which high level skills will remain important for UK competitiveness in the global economy over the long-term and continue to generate significant benefits to individuals, employers and the economy.

Human capital and economic growth

The importance of the role of human capital in driving economic growth has been studied in a wide-range of theoretical and empirical literature that has evolved since early contributions in the 1950s. Human capital is the productive wealth associated with the set of skills, competences and knowledge that individuals acquire through formal study and training (for example, at school, college, work-based learning or university) and through the learning-by-doing that accompanies work experience.

In terms of economic outcomes, employed individuals with higher levels of human capital help to enhance the productive capability of firms, contributing to economic growth. Higher levels of human capital are necessary for product or process innovation, assisting in developing new technologies, providing a talent pool for entrepreneurship, and promoting agglomeration externalities arising from the concentration of skilled individuals and firms in one place. Graduates may also continue to study for higher degrees and pursue a career in research which further adds to the economy's knowledge base and the potential for technological advances.

Theoretical models of long-term economic growth examine the way in which improvements in both the quantity and quality of inputs such as capital and labour, and the efficiency with which these inputs are used (broadly defined as "technology") increase output. Early neoclassical contributions based on the work of Solow and Swan in the 1950s did not seek to explain the rate of technical progress, taking it as given (exogenously determined), and focused on the accumulation of capital and labour. In the short-run, investment in capital increases output per person, but in the long-run, the decreasing returns to further investment will eventually lead to a steady

state where new investment just offsets depreciation, capital and output per person reach a steady state and economic growth is driven to zero. The only source of economic growth is derived from the effectiveness by which inputs are combined within the production process, which is determined by the existing stock of knowledge within the economy. This stock is simply assumed to grow at an exogenous rate to reflect scientific discoveries and innovations.

Subsequent developments in the literature have made more explicit attempts to model the rate of technical progress to gain a greater understanding of the sources of long-term economic growth. Early models of endogenous growth assumed that the accumulation of capital generated technological advances which offset the effects of diminishing returns. In other approaches, the stock of human capital affects growth in output per worker through the contribution it makes to a research sector that leads to greater product variety in the economy, or product innovations which make old technologies obsolete through Schumpeter's process of creative destruction.³³

Although the theoretical approaches offer differing insights into the relationship between human capital and growth, the empirical literature is often unable to discriminate between these different hypotheses. Instead it examines the role of a range of variables implied by the models (including human capital) in explaining the growth in GDP across countries and over time. Sianesi and Van Reenen (2003) present a summary of this literature, outlining some of the methodological difficulties associated with cross-country regressions and the importance of the way human capital is measured. In particular, whilst exogenous growth models imply that it is the *flow* of human capital (for example, enrolment in education) that influences growth towards a new steady state, endogenous growth models typically predict that the existing *stock* of human capital (for example, average educational attainment of the population) can generate new ideas and technology that drive growth. Overall, Sianesi and Van Reenen conclude that the literature indicates a positive relationship between human capital measures and growth. For example, for tertiary education, Gemmell (1996) finds evidence for both the initial stock and subsequent growth in education exerting a positive impact on GDP growth across OECD countries between 1960 and 1985.

By comparing high-income and developing countries, some studies find that primary and secondary education are most important for growth in developing countries while higher education is more important within OECD countries (for example, Keller (2006)). Other studies, however, find that tertiary education is important for less developed countries in terms of their ability to catch-up with developed countries (for example, Chatterji (1998)).

Although many studies focus on the number of years of education as the measure of human capital, there is also a literature which argues that the **quality of education** is more important than the quantity. International surveys provide one way of measuring individual's competences in key areas like mathematics and science, which can be used to construct measures of the quality of human capital which can

³³ A full discussion of the range of models of economic growth is provided by Aghion and Howitt (2009).

be used alongside the quantity. For a sample of 50 countries over the period 1960 to 2000, Hanushek and Woessmann (2010) find that a one-half standard deviation increase in individuals' mathematics and science performance increased the annual growth rate of GDP by 0.87%.³⁴

Rather than examining the overall relationship between human capital and GDP growth, other studies have instead focused on exploring the evidence for the mechanisms through which human capital ultimately generates growth. Following the early thinking by Nelson and Phelps (1966), which described how the stock of human capital facilitates the adaptation of productivity enhancing technologies, Ciccone and Papaioannou (2007) test whether as a result of new technologies being skill-biased, the initial stock of human capital leads to higher employment and value-added growth in human capital intensive industries across a range of countries. Their results indicate positive and significant relationships between both the initial level and the improvement in education, and the growth in schooling-intensive industries over the period 1980 to 1999 (where the schooling intensity of sectors across countries is defined in terms of the educational attainment of employees in US sectors).

In addition to the links between human capital and growth, econometric studies also attempt to quantify the relationship between investment in research and productivity. A 2004 OECD study of a group of 16 countries from 1980 to 1998, including the UK, found that a 1% increase in public R&D increases multi-factor productivity by 0.17%.³⁵ These findings relate to the overall economic impact from research, but do not differentiate the impact of research in delivering highly skilled people to the labour market and thus contributing to the stock of human capital.³⁶ An important element of research is the development of trained researchers who have significant impact to the UK economy by working both in the publicly funded research base, and outside in industry. English universities performed £1.6bn of contract research, collaborative research and consultancy in 2008/09.³⁷

HE and regional economies

In addition to looking at the relationship between higher education and measures of national economic growth, there is also a literature focusing on the importance of HEIs and graduates for local and regional economies. The most traditional role for universities is seen in terms of the production of research and highly skilled individuals, but some (e.g. Brennan, King and Lebeau (2004)) have argued they also have a role to play in facilitating cultural values and attracting and retaining highly skilled individuals which enables local areas to exploit knowledge and grow.

The OECD has been exploring the role of HEIs in regional and city development through a series of ongoing reviews that focus on a number of regions across both OECD and non-OECD countries. They also argue that the role of HEIs goes beyond education and research and extends to 'cultural and community development' which

³⁴ See Hanushek and Woessmann (2008) for a review of the literature on the impact of cognitive skills on growth.

³⁵ Guellec and Van Pottelsberghe De La Potterie (2004).

³⁶ In 2009/10, almost 19,000 new PhD qualifications were granted by UK HEIs.

³⁷ PACEC/CBR analysis of HEBCI surveys.

includes activities that promote diversity, attract and retain talent, and create the conditions to promote innovation and the growth of business.

In a number of papers,³⁸ Richard Florida has argued that too much emphasis is often placed on the role of universities in developing knowledge through business collaborations that can be exploited commercially, leading to regional growth. Although this remains an important function, he argues that universities are vital to local growth through their ability to attract and retain talented individuals from a diverse set of backgrounds which, in turn, helps to bring in other individuals, generate new ideas and promote entrepreneurship (Box 1).

Box 1: Technology, talent and tolerance in the creative economy

Florida et al. (2006) discuss how Technology, Talent and Tolerance are the three key drivers of development in the creative economy and that universities are a necessary but not sufficient condition for regional economic development to occur through these channels. Using data from across 331 US metropolitan areas, they explore the relationship between university size and a range of indicators relating to technology, talent and tolerance, including:

- There is a positive correlation between the number of students per capita in an area and measures of **talent** including the percentage of the population aged 25+ who hold degrees and the percentage of employees in creative occupations (e.g. management, business, legal and healthcare occupations) and in super-creative occupations (e.g. computing, engineering, arts, design and media occupations);
- Only 10% of US areas were “brain gain” areas in terms of attracting talent which is found to be positively correlated with a number of regional development indicators (e.g. job growth and per capita income growth); and,
- A positive correlation exists between student and faculty numbers and a composite measure of **tolerance** which captures the relative proportion of individuals living in an area by race, nationality, sexual orientation and with creative talents (e.g. authors, actors and dancers).

A study by the Economic and Social Research Council (ESRC) (2006) notes that many qualitative studies refer to a ‘buzz’ that HEIs can add to a city or town, although this is difficult to analyse in a systematic way. Case studies also show that the presence of a large student population may be beneficial for the perception of a city’s cultural and entertainment life, which can in turn help to attract businesses.

Linked to this, the ESRC Regional Impacts programme³⁹ is a large ongoing study on the local social effects of HEIs and students. The project has noted the importance of

³⁸ See for example, Florida (1999).

³⁹ <http://ewds.strath.ac.uk/Default.aspx?alias=ewds.strath.ac.uk/impact>

students as catalysts in their local communities. This can happen through them providing neighbourhood change and revitalisation or creating a demand for diverse new services. The programme has not, however, found much quantitative evidence for these phenomena, which is likely to reflect the inherent difficulties in measuring these effects at a spatial level.

Other researchers, however, continue to argue that human capital policies should not be focused on the attraction and retention of skilled individuals within the creative classes to prevent brain drain. In reviewing the empirical literature for the US, Donegan et al. (2008) find mixed evidence to support the impact that the types of talent and creativity measures proposed by Florida have on regional growth outcomes. Their own analysis leads them to argue that more traditional strategies such as investing in high-quality education and promoting business development are more effective for growth.

Within England, there is considerable variability in economic performance across the regions. Following the initial work of Krugman (1991), the concept of 'new economic geography' has been used to analyse the emergence and persistence of regional economic disparities. This approach recognises that there may be spatial clustering of activities that arise from market imperfections, externalities or the public good properties associated with specific locations, for example town centres.⁴⁰

The clustering of highly skilled workers provides one way of generating agglomeration externalities that benefit firms co-located in one area. A pool of skilled labour improves the quality of job matching between individuals and employers, and may create additional incentives for individuals to acquire new skills (if market signals indicate these skills are being utilised productively). In addition, a pool of skilled labour may facilitate the process of knowledge transfer and innovation, generating benefits for both individuals and firms in the region.

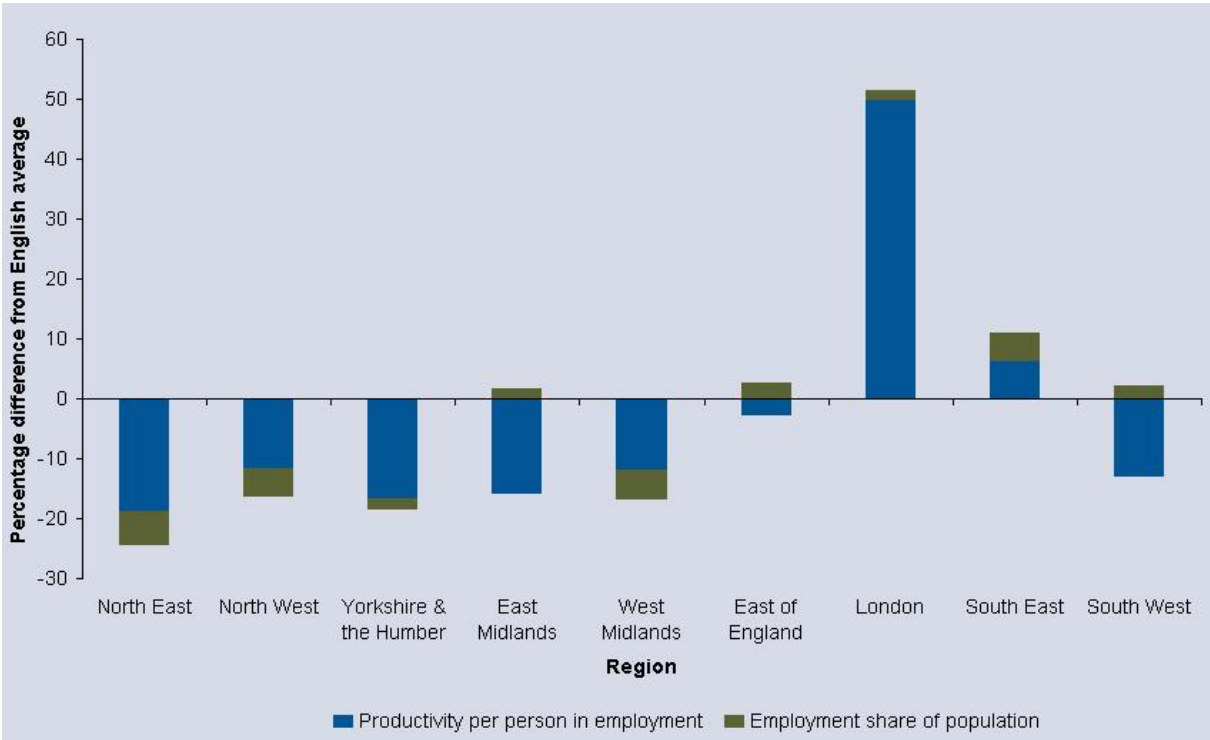
In 2008, London and the South East were the leading performers in terms of GVA per head. It is important to recognise, however, that there remains variability within regions; economic performance in parts of East London, Kent and East Sussex are relatively low while areas around the cities of Manchester, Bristol and Leeds have stronger economic performance. Between 1989 and 2008 the disparities in regional incomes have risen with most of the change taking place since the mid-1990s.⁴¹

By decomposing GVA differentials into their constituent parts of productivity and employment, it is found that productivity differentials account for most of the disparities in regional economic performance. These productivity differentials have also been widening over time, with London continuing to move ahead of other regions as a result of stronger average annual productivity growth (4.9% over the period 1993 to 2008 compared to 3.6% in the slowest growing region of the North East).

⁴⁰ Venables (2005).

⁴¹ BIS/CLG (2010) Economics Paper No. 7 provides a detailed description of relative economic performance across English regions.

Figure 11: Decomposition of regional GVA per head disparities, 2008



Source: ONS Regional Accounts, ONS Annual Population Survey, ONS population estimates

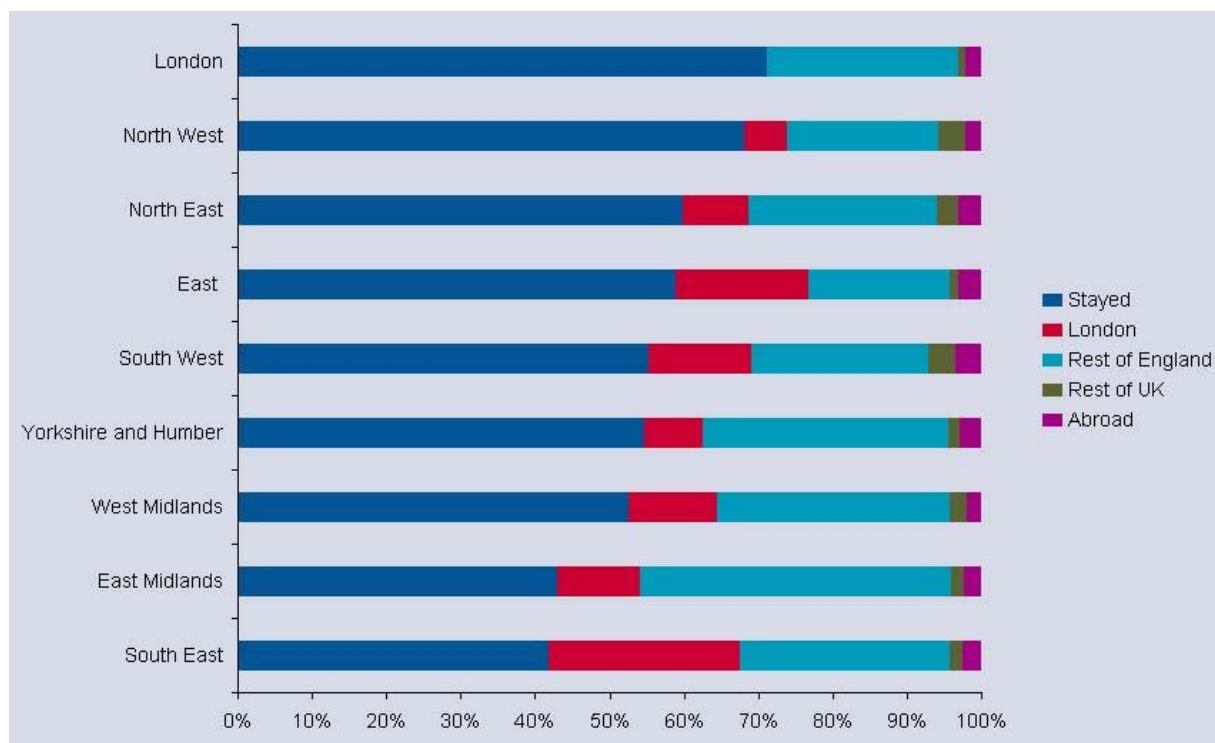
Notes: 1. English NUTS1 areas. 2. Employment information is for those aged 16+. 3. Regional GVA estimates are on a residence basis where the income of commuters is allocated to where they live rather than work. 4. Statistical discrepancies are included within the productivity differential. 5. Nominal GVA. 6. 2008 data is provisional and subject to revision.

Wages are often used as a proxy for productivity. Gibbons et al. (2010) use wage dispersion analysis across 157 areas in Britain in order to identify how much of the dispersion is attributable to individual characteristics that occur as a result of the mobility of individuals (sorting) or area-specific effects. Their analysis shows that wage disparities have remained persistent over the last decade and that only a small proportion (around 10%) can be attributed to area effects, with the remainder due to the characteristics of individuals located there.

In an analysis of the 100 largest cities in the UK, Cowling (2009) finds that the distribution of talent – measured by the percentage of the population with a degree in 2001 – is uneven, ranging from 53% in Oxford to 15% in Ipswich. This pattern would be anticipated if cities with large universities are able to retain a significant number of graduates. Cowling then looks at the specific issue of retention (defined as students who left their home to study at a different university city and remained there in the first six months after graduation) and finds that cities such as Belfast, Glasgow, Aberdeen and Edinburgh retained the greatest proportions of graduates. Consistent with some of Florida’s hypotheses, positive correlations are also found between the attraction of this new graduate talent to cities and the stock of existing local graduates, as well as with measures of culture and entrepreneurial activity.

Using the Higher Education and Statistics Agency's (HESA) data on the destinations of leavers from higher education, Mosca and Wright (2010) also look at the extent to which students move to other regions or countries in the first six months after graduating. Figure 12 presents the English region in which students studied and the percentage of students who were in employment in the same region (stayers), London, the rest of England, the rest of the UK, and abroad six months later. The South East retains the lowest percentage of graduates at 42%, but it is important to note that around one-quarter of South East graduates find employment in London. For the other regions of England, the East Midlands has the lowest retention rate at 43%.

Figure 12: Distribution of graduates in employment six months after completion by place of study, pooled 2002/03 to 2006/07 cohorts



Source: Mosca and Wright (2010) analysis of HESA data

Economic returns to graduates

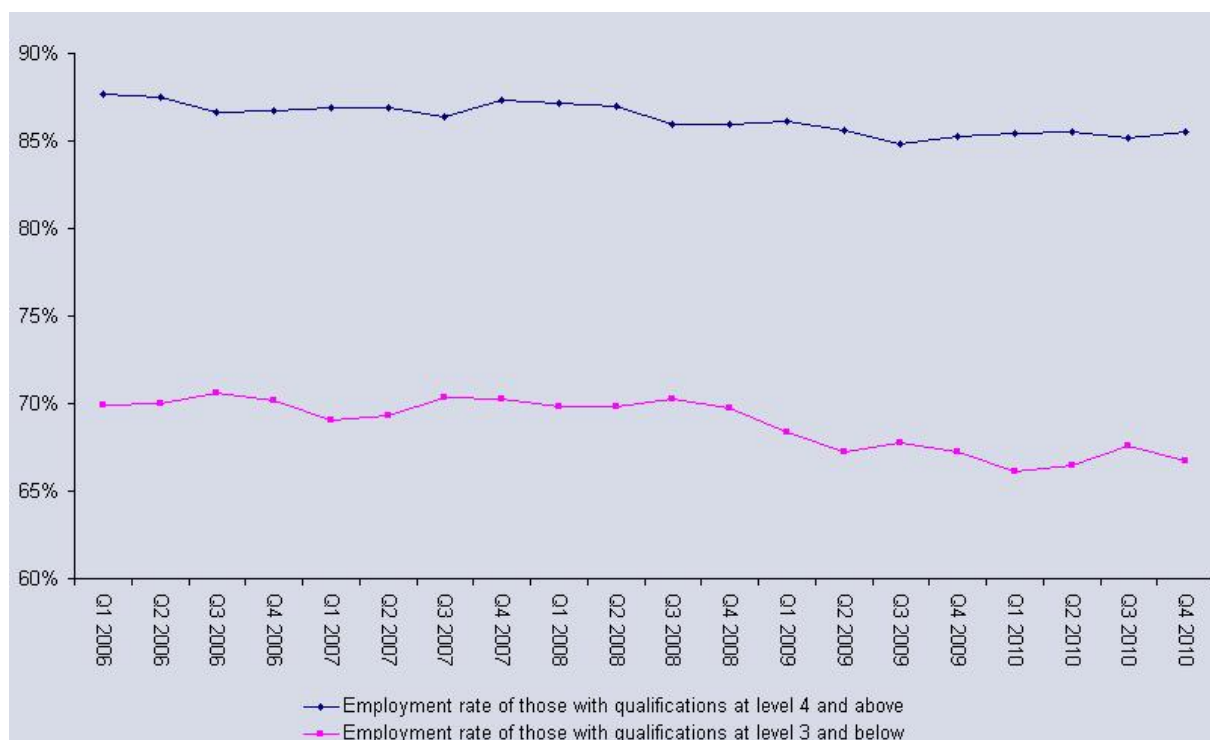
The macroeconomic evidence summarised above looks at the link between measures of human capital (including tertiary education) and GDP. There is also a large literature based on microeconomic data that assesses the relationship between the qualifications held by individuals and the benefits they receive in the labour market through increased employment and higher earnings. In addition to raising the chances of finding employment, the human capital literature predicts that more skilled individuals are more productive in their jobs which, in a competitive labour market,

will be reflected in the wages they receive.⁴² This individual-level evidence which uses wage outcomes as a proxy for productivity therefore provides another approach for examining how human capital can exert a positive impact on growth.

Employment

There are substantial labour market benefits in the form of increased employment rates for more qualified individuals. Figure 13 shows the employment rates of the working age population between 2006 Q1 and 2010 Q4. There is a notable difference in the employment rate of those holding level 4+ qualifications (equivalent to HE level qualifications) compared to those at level 3 (equivalent to two A-levels) or below. In 2010 Q4, 85.5% of those with level 4+ were in employment – 18.8 percentage points higher than those with level 3 or below. The corresponding ILO unemployment rates for these two groups of individuals in 2010 Q4 were 4.2% and 10.1% respectively.

Figure 13: Employment rates for those with level 4 and above qualifications compared to those with level 3 or below



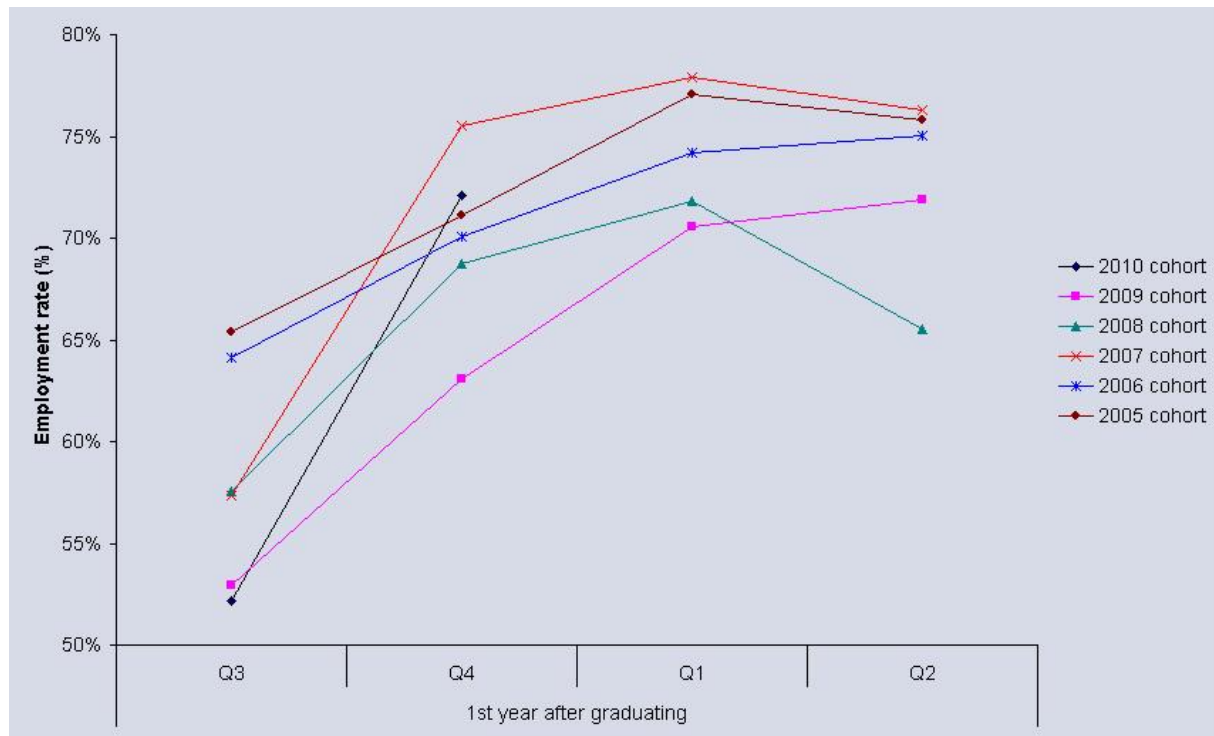
Source: Labour Force Surveys 2006Q1 to 2010 Q4, working age population in England only

The 2008 recession was observed to have had an impact on the labour market outcomes of recent graduates. Data from the Labour Force Survey can be used to estimate the employment rates of recent cohorts of first-degree graduates over the first year after graduation. Figure 14 presents the employment rates of those

⁴² As an alternative to the theory of human capital, the screening hypothesis asserts that individuals acquire qualifications in order to signal their ability to firms in the labour market rather than the qualifications themselves enhancing their productive potential.

graduating in each of the years between 2005 and 2010. Degree courses typically finish during the summer months of the year and so it is assumed that graduates first enter the labour market in the third quarter of the year (July-September) with the employment rate then rising over the year as graduates find jobs in the labour market.

Figure 14: Employment rate of graduating cohort in the year following graduation



Source: Labour Force Surveys 2005 Q3 to 2010 Q4, recent first degree graduates in England only

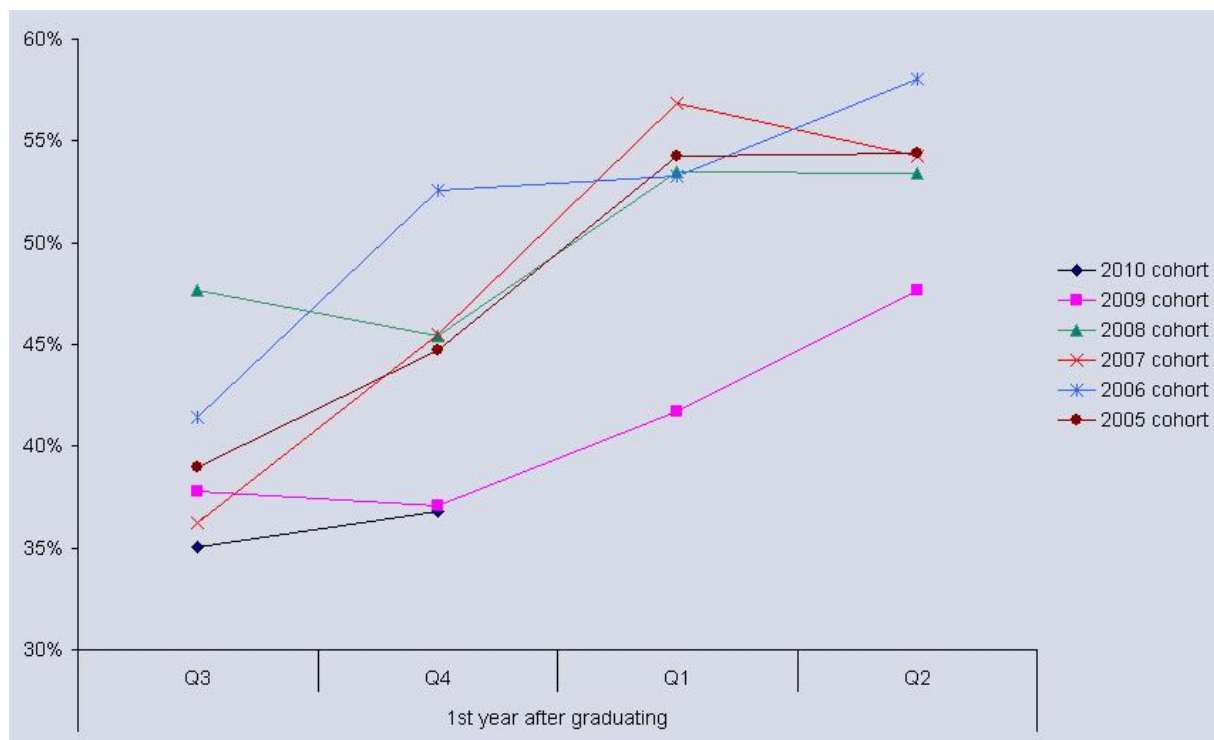
Four quarters after graduation (Q2) there appears to have been a notable decline in the employment rate of 2008 graduates compared to previous cohorts. For 2009 graduates, the employment rate had recovered to 71.9% at the same point since graduation, but remained below that of the 2005, 2006 and 2007 cohorts. For the most recent cohort of 2010 graduates, 52.2% had found employment in the quarter in which they graduated – lower than previous cohorts – but by the second quarter after graduation, 72.1% were in employment, which is a higher employment rate than for previous cohorts (except 2007) at the equivalent point after graduation.

During the previous recession in the early 1990s, those with higher level qualifications saw a decline in their employment rate, as did the overall population, and this impacted most on younger graduates. However, both recent graduates and all those with higher level skills were able to recover their position in the labour market after a delay compared to those with lower level skills whose employment chances never fully recovered back to pre-recession levels. As Figure 13 shows,

those with HE level qualifications have maintained their employment advantage in the latest recession – indeed, the gap has increased slightly.

In addition to analysing the employment rates of successive cohorts throughout the downturn it is also useful to look at the nature of jobs that graduates are moving into and whether they are able to secure jobs that utilise their skills. Figure 15 shows the proportion of graduates from recent cohorts in employment who are in “graduate level jobs”,⁴³ which generally increases during the year after graduation. For the 2009 cohort, 47.6% were employed in graduate level jobs in the fourth quarter after graduation (Q2), notably lower than the employment rates of previous cohorts at the same stage since graduation.

Figure 15: Percentage of employed graduates in graduate level jobs in the first four quarters since graduation



Source: Labour Force Surveys 2005 Q3 to 2010 Q4, recent first degree graduates in England only

Overall, although the recession has had an impact on the labour market prospects of both graduates and individuals with lower level qualifications in the short run, there remains a substantial advantage in terms of employment rates over the lifetime for investing in a degree.

⁴³ As defined using the SOC(HE) classification

Earnings

Looking at the mean earnings of working age individuals who are employed reveals that graduates receive higher earnings than individuals with lower level qualifications. For the most recent data available (2010), individuals in full-time employment with their highest qualifications at or below level 3 (equivalent to two A-levels) earn on average £22,500 compared to £36,000 for those with a first degree as their highest qualification and £42,500 for those with higher degrees as their highest attainment. Amongst postgraduates, those with doctorates earn £48,500 and individuals with Masters degrees as their highest qualifications receive on average £44,000.⁴⁴

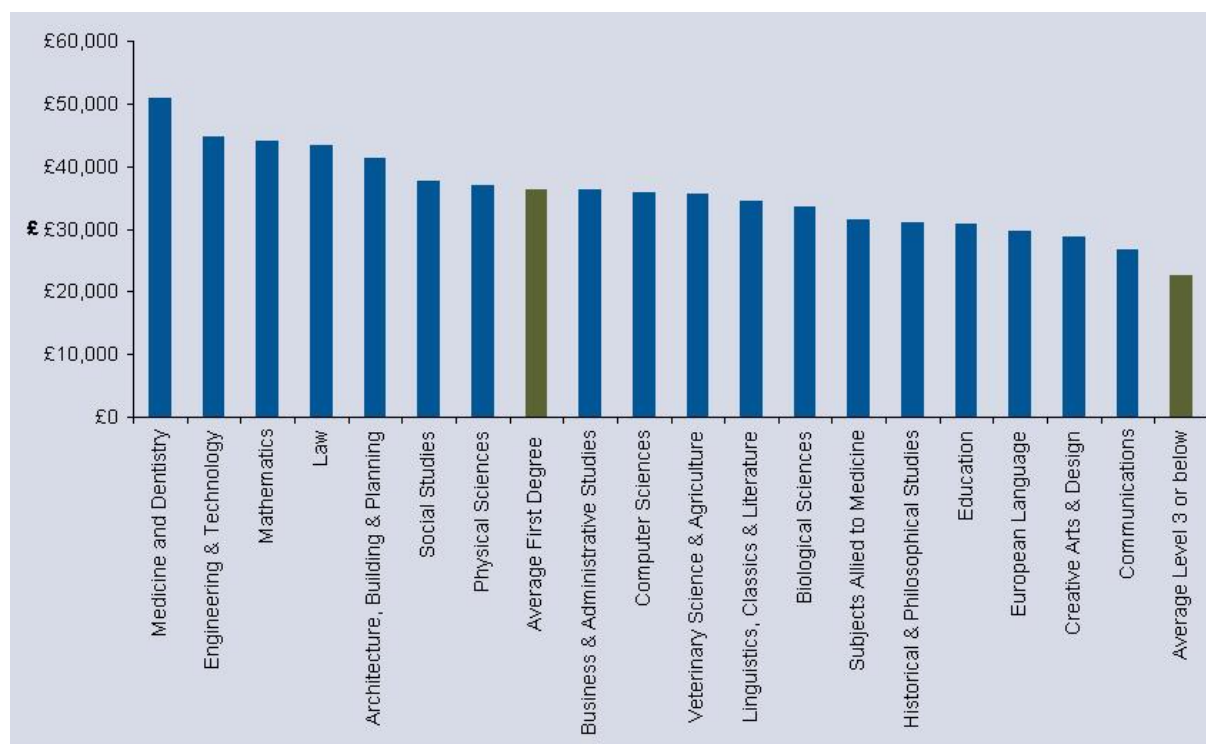
Table 1: Mean earnings of those in employment by highest qualification held

Highest qualification held	Mean earnings, £
Level 3 or below	£22,500
First degrees	£36,000
Higher degrees	£42,500
... Masters	£44,000
... Doctorates	£48,500

Source: Pooled Labour Force Surveys 2010 Q1 to Q4, working age population in England, full-time employees only, figures rounded to the nearest £500

Looking across subjects, there is some variation in the mean earnings of first degree holders. Medicine and dentistry graduates are observed to have the highest average earnings of £51,000, followed by Engineering and technology, Mathematics, Law, and Architecture, building and planning graduates all earning over £40,000.

⁴⁴ For some postgraduate qualifications e.g. PGCE average earnings are found to be £34,500 and therefore below the average for first degree holders.

Figure 16: Mean annual earnings of first degree holders by subject studied

Source: Pooled Labour Force Surveys 2010 Q1 to Q4, working age population in England, full-time employees only, figures rounded to the nearest £500

Although comparisons of average earnings provide some insight into the value the labour market attaches to graduate-level qualifications, the raw earnings data does not control for a range of other individual and job characteristics which may also affect earnings. More robust estimates of the returns to individuals are based on econometric models that estimate the wage enhancement that individuals with a degree receive compared to individuals with similar observable characteristics who do not hold degree-level qualifications. Although there are numerous studies that follow this approach,⁴⁵ this section focuses on the results from a recent study by London Economics (2011) that estimates the returns to HE qualifications. In a similar way to other studies, London Economics define two types of wage return for first degrees:

- The marginal wage return gives the premium that individuals who hold a first degree as their highest qualification receive relative to those whose highest qualification is at the next level below (two or more A-levels); and,
- The average wage return estimates the wage premium first-degree holders receive irrespective of whether the first-degree is their highest qualification.

⁴⁵ For example, Jenkins et al. (2007) focus on level 2 and level 3 qualifications while Dickerson (2005) estimates returns across all levels of attainment. A summary of the returns to intermediate vocational qualifications is provided by McIntosh and Garrett (2009).

Using pooled LFS data between 1997 and 2009, London Economics (2011) estimate that the marginal wage premium for first degree graduates is 27.4% (29.7% for females and 23.5% for males) relative to those whose highest qualification is two or more A-levels as their highest qualification.⁴⁶ This premium rises with the class of degree obtained; for example, an individual with a First class degree earns 4.7 percentage points more than someone with an Upper Second. All subjects are found to generate positive returns although there is substantial variation by subject, with the wage effect ranging from 82.8% for medicine and dentistry to 6.3% for creative arts and design.⁴⁷

In addition to estimating the pure wage effect associated with higher education, it is also important to undertake a full Net Present Value (NPV) calculation that takes into account both the range of benefits and costs. The benefits consist not only of the wage effect when graduates are in employment, but also take account of the higher probability of being in employment in each year. Costs consist of both the direct costs associated with tuition and maintenance as well as the opportunity costs that arise from the earnings that could have been received in the labour market during the time spent studying. In performing this type of calculation, London Economics estimate the discounted net lifetime earnings of an undergraduate degree to be around £120,500 for men and £82,500 for women, with an average across all individuals of £108,000. The internal rate of return (IRR) – the discount rate that would yield a NPV of zero – is calculated to be 15.6% for men and 14.8% for women.⁴⁸

⁴⁶ For those in both the treatment (first degree) and control (two or more A-levels) groups holding vocational qualifications, only those with qualifications up to level 3 are included. The comparison between graduates and those with A-levels may partially mitigate the effects of 'ability' bias which the LFS cannot adequately correct for. The wage returns may be overstated if individuals with higher levels of unobservable ability earn higher wages and are more likely to acquire degree level qualifications. In addition, measurement error and endogeneity of human capital investments may bias the estimated returns, although some researchers (e.g. Dearden 1999 and Dickerson, 2005) argue that these varying sources of bias tend to offset each other in LFS analysis.

⁴⁷ Previous studies using Labour Force Survey data also found the wage returns to first degrees varied by subject (e.g. O'Leary and Sloane, 2005). Part of the variation in returns by degree subject may arise from the subjects studied at A-level and the grades achieved, which are not recorded in LFS data. For example, medicine and dentistry graduates may have achieved high grades in A-level subjects that would be valued in the labour market, meaning that part of the estimated return to their degree is attributable to their A-levels.

⁴⁸ Figure 17 and Figure 18 rank subjects by NPV. Rankings by IRR and NPV may differ depending on the size and timing of the flows of costs and benefits.

Figure 17: Net lifetime benefits (£) and internal rates of return (%) by subject for males

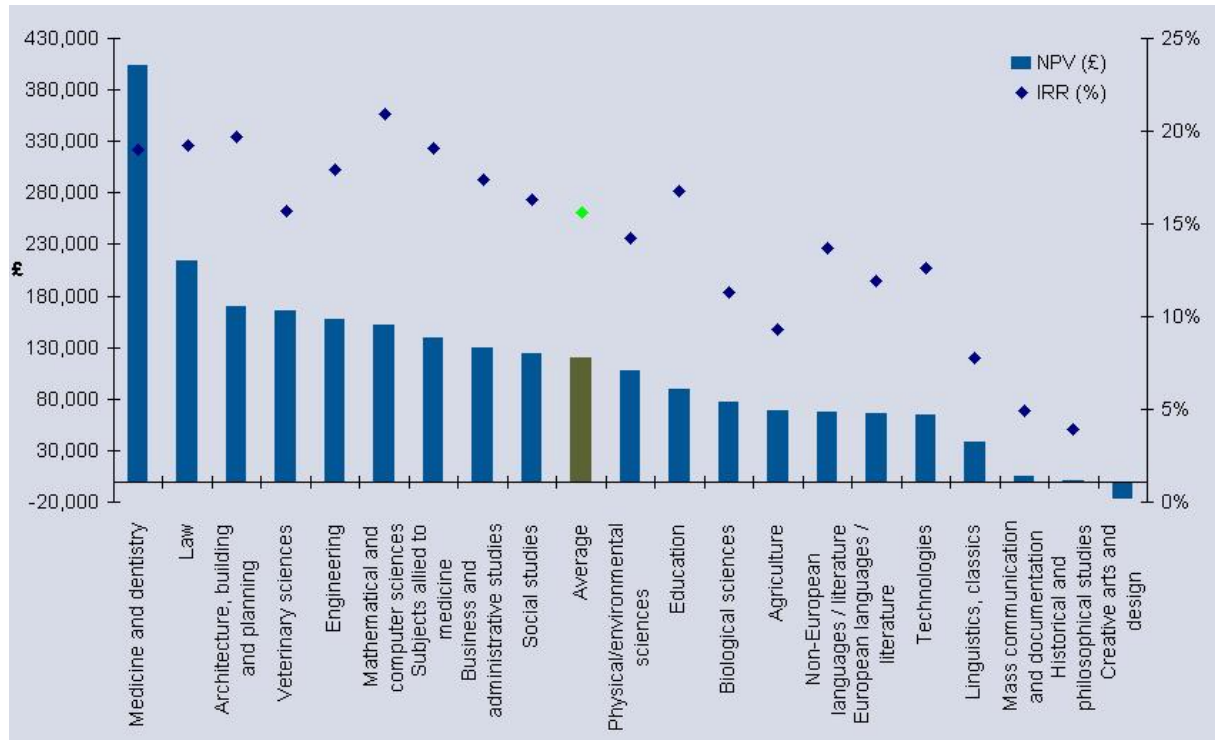
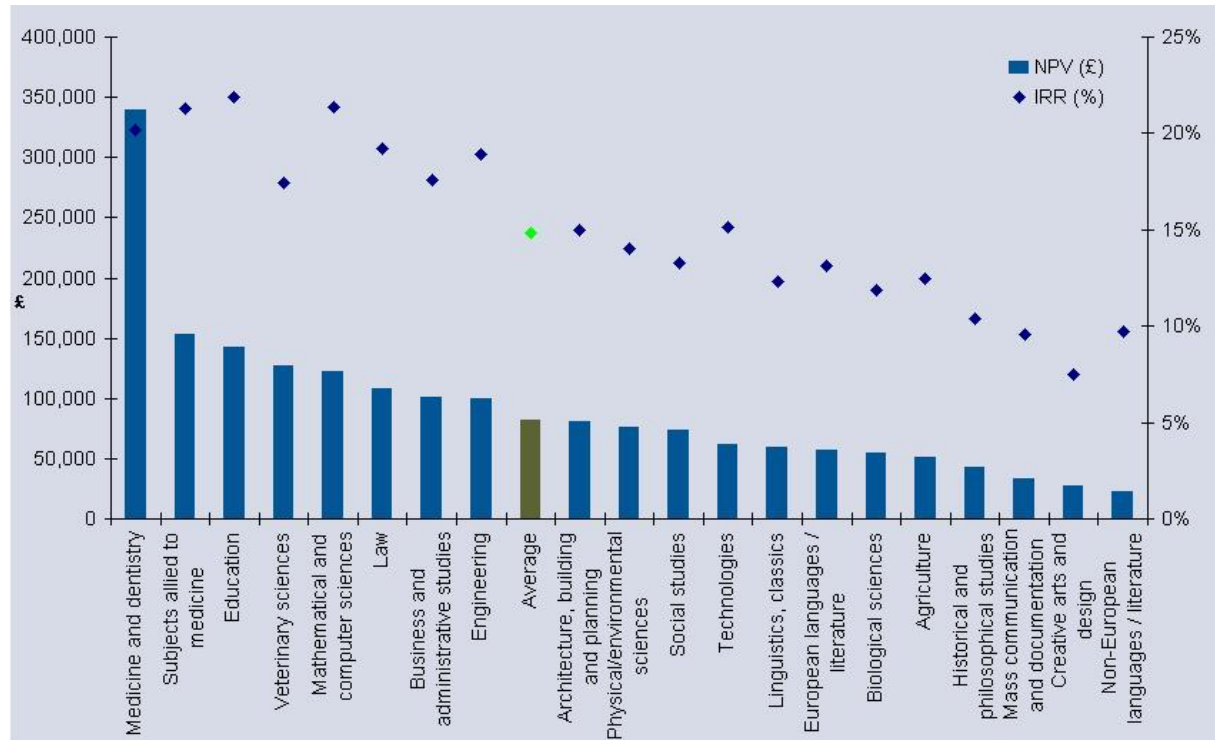


Figure 18: Net lifetime benefits and internal rates of return by subject for females



Source: London Economics (2011)

The London Economics analysis also provides similar information on the wage premium, net present value and internal rate of return for both Masters and Doctoral degrees (Table 2). Compared to someone with an undergraduate degree, males and females with a Master's degree receive a marginal wage premium of 8.9% and 10.3% respectively. For those with doctorates, this rises to 16.2% and 17.1%, although for many individuals this will also include the premium from also having a Master's degree.

Table 2: Wage premium, Net Present Value and Internal Rate of Return for the individual for Masters and Doctoral degrees for males and females relative to undergraduate degrees

	Males	Females
Masters		
Wage premium	8.9%	10.3%
NPV	£58,500	£41,500
IRR	14.9%	11.3%
Doctorate		
Wage premium	16.2%	17.1%
NPV	£76,000	£36,000
IRR	8.7%	6.8%

Source: London Economics analysis of LFS and HEFCE data (NPV figures rounded to nearest £500). Undergraduate degree holders within the control group may also hold vocational qualifications up to level 3

Finally, London Economics estimate the benefits and rate of return to the Exchequer associated with public investment in higher education qualifications. The benefits comprise of greater income tax, National Insurance and VAT payments made by graduates over their working lives,⁴⁹ while the costs consist of the HEFCE teaching funding, the foregone tax revenue during the qualification acquisition period and the costs of the student support package. Table 3 summarises the NPV and IRR for undergraduate degrees, master's degrees and doctorates.

⁴⁹ During the period of study, the Exchequer receives reduced tax contributions which would have been received had the students been working rather than studying which reduces these benefits.

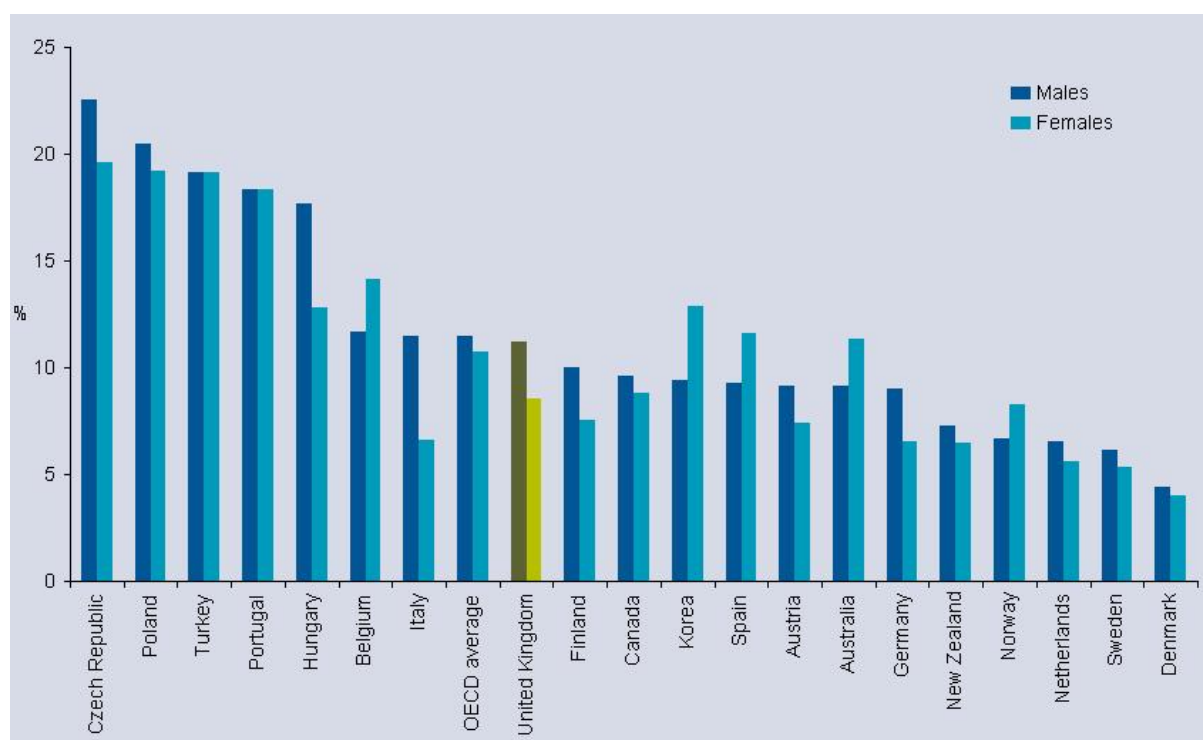
Table 3: Net Present Value and Internal Rate of Return for undergraduate degrees, master's degrees and doctorates (males and females) for the Exchequer

	Males	Females
Undergraduate degrees		
NPV	£102,000	£59,000
IRR	11.4%	9.6%
Masters		
NPV	£67,000	£44,500
IRR	29.5%	21.1%
Doctorate		
NPV	£90,000	£40,500
IRR	10.6%	8.3%

Source: London Economics (2011) analysis of LFS and HEFCE data (NPV figures rounded to nearest £500)

Following a different methodology and data sources, the OECD (2010) also present international comparisons of the NPV and IRR to individuals' investments in tertiary education. The returns to males and females in the UK are estimated to be 11.2% and 8.5% respectively, slightly below the OECD averages of 11.5% and 10.7% (Figure 19). Countries with the highest rates of return include the Czech Republic, Poland, Turkey, Portugal and Hungary. These countries have a relatively low proportion of the population holding graduate-level qualifications compared to the OECD average. Returns are found to be at their lowest in Denmark, Sweden and the Netherlands where tertiary attainment levels are similar to the UK.

Figure 19: Private internal rate of return (%) to individuals from tertiary education, 2006



Source: OECD Education at a Glance 2010

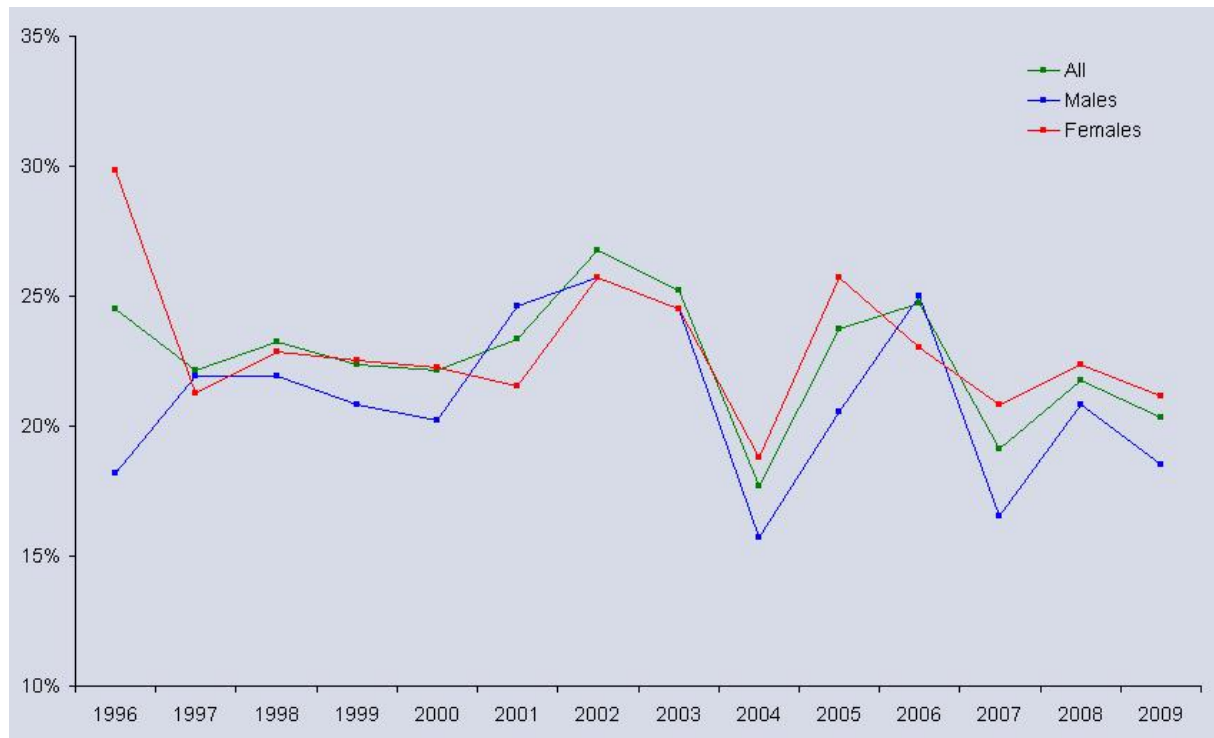
In addition to the private returns to individuals, the OECD also present estimates of the public returns to investment in higher education. The costs comprise of the direct public costs (infrastructure, wages of teaching staff and subsidies) and the loss of tax revenue during the period in which individuals study. Benefits to the public arise from greater income tax paid during the post-study period and a reduction in payments associated with unemployment. For the UK, the IRR for public investment is estimated to be 10.4% and 10.1% for males and females respectively compared to OECD averages of 11.0% and 9.5%.⁵⁰

Although there has been an expansion in the supply of graduates over time, which may be expected to reduce the wage premium to degrees, studies find that the relative premium has remained fairly stable over time since the mid 1990s. For example, Jenkins et al. (2007) find that the premium remained around 20% to 30% between 1996 and 2006. Similarly, London Economics (2011) find that although there is annual variation, the estimated average returns to undergraduate degrees have generally remained around 20-25% (Figure 20). Earlier assessments of the graduate wage premium found that it increased during the 1980s (e.g. Harkness and Machin (1999) estimate that for men the premium increased from 14% for the period 1979-81 to 20% by 1993-95). The recent stability of the premium is often interpreted

⁵⁰ OECD Education at a Glance 2010.

as evidence that at the same time as an expansion in supply, there has been an increase in demand for graduate-level qualifications in the labour market.

Figure 20: Average wage premium for undergraduate degrees between 1996 and 2009 for males, females and all individuals



Source: London Economics (2011)

Estimates of the wage premium associated with qualifications are typically presented as an average across all individuals, or separately for males and females. There is the possibility, however, that the wage premium varies for groups of individuals with different characteristics, for example, by socio-economic group. Dearden, McGranahan and Sianesi (2004) find that overall there are sizeable wage returns to HE versus level 2 qualifications of 15% for men. Although in absolute terms men from lower socio-economic groups⁵¹ earn less, their results indicate that the percentage wage returns to HE are greater compared to those from higher socio-economic groups (20% compared to 9-11%).

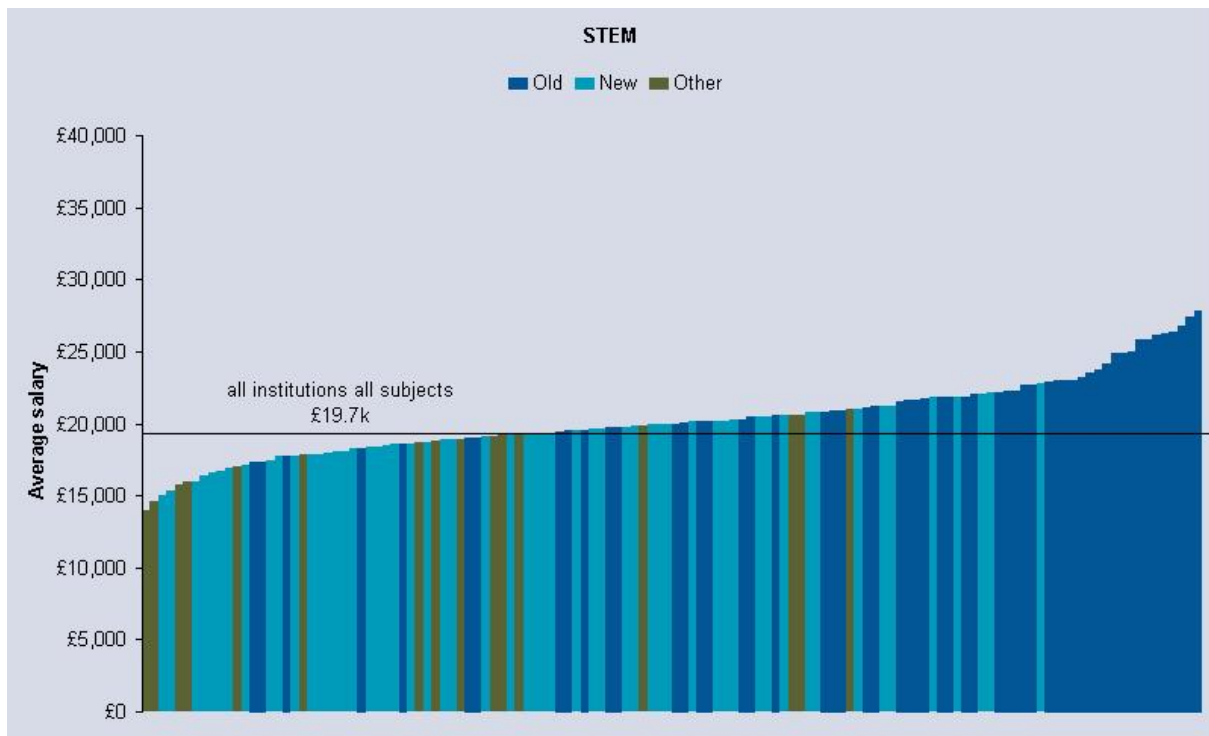
Dickerson (2005) examines the extent to which the wage returns to qualifications vary according to an individual's position in the wage distribution. Those with unobservable productivity enhancing abilities would be expected to be higher up the wage distribution. If these unobserved abilities are also correlated with qualifications, the wage returns would be greater for those higher up the wage distribution. Dickerson finds some evidence that the returns to level 4 qualifications rise for

⁵¹ Based on National Statistics Socio-economic classification (NS-SEC) which is an occupationally based classification covering the whole population.

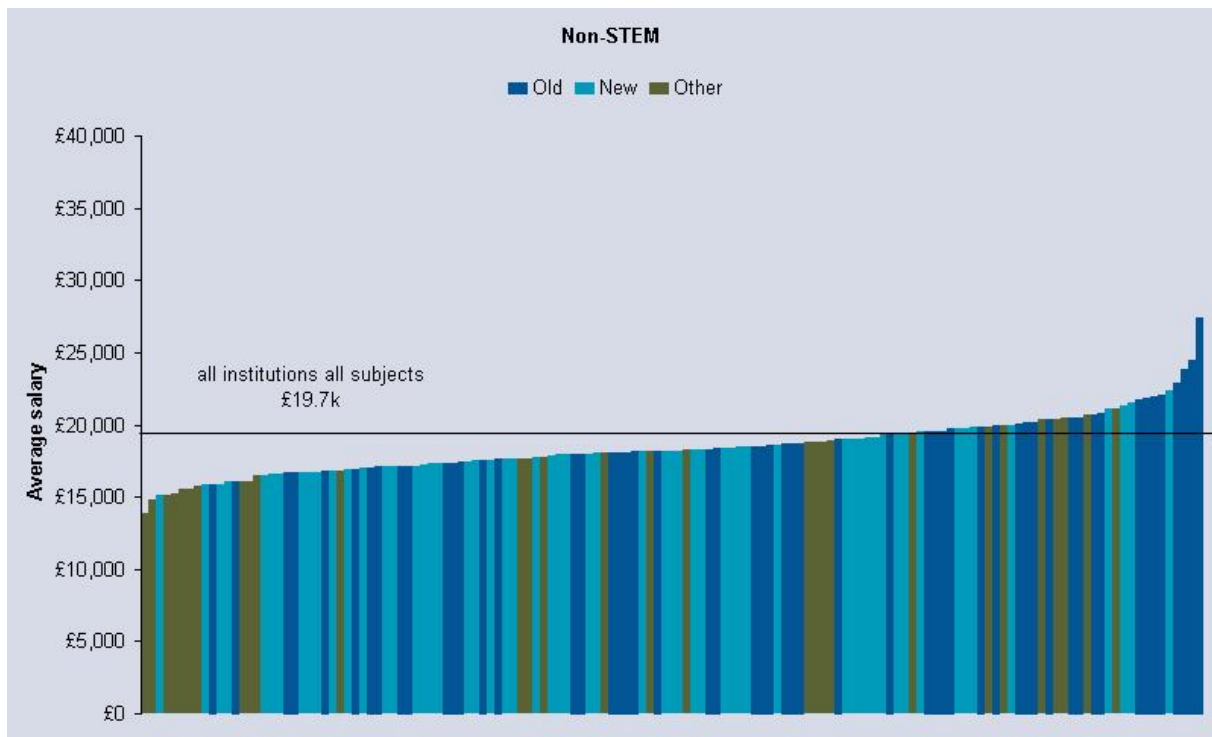
women further up the wage distribution but that the returns remain relatively constant for men.

It may also be expected that the wage outcomes of graduates will vary according to the institution they attended. By analysing the raw earnings data (and thus not controlling for other personal and job related characteristics) six months after graduating, Figure 21 shows the average earnings of STEM and non-STEM graduates by different groups of institutions.⁵² The upper end of the distribution for STEM subjects is dominated by the older HEIs, but across the rest of the distribution, and also for non-STEM subjects, there is a mixture of both old and new institutions.

Figure 21: Average salary of those in full-time employment 6 months after completing first-degree programmes 2008/09 by STEM and non-STEM and institution type – old (pre-1992 institutions), new (post-1992 institutions) and other (specialist institutions e.g. arts schools)



⁵² Analysing earnings six months after graduation may not reflect longer-term labour market outcomes and so it remains possible that greater variation by institution could emerge over time.



Source: BIS internal analysis of HESA data

For part-time students, it is more difficult to analyse the impact of study on wage outcomes. The median earnings at 6 months after graduation of those who studied part-time is greater than those who studied full time (£25,000 compared to £20,000 amongst the 2007/08 cohort⁵³) but those who study part-time tend to have different characteristics, for example, they are more likely to be female, older, and already have previous HE qualifications leading to them studying different types of courses. In addition, most part-time students were employed before their course started, but a lack of data on their previous earnings makes it difficult to assess the impact of qualifications obtained through part-time study. In a survey of part-time graduates from the Open University and Birkbeck College, Feinstein et al. (2007) find that around seven out of ten graduates reported that their skills had improved and one-third believed that their career opportunities and future earnings potential had also improved.

Benefits to employers

Unlike the benefits of HE to individuals which can be analysed using large-scale micro datasets containing detailed information on labour market outcomes and personal characteristics (including qualifications held), there is less data linking workforce skills to measures of business performance. The National Employers Skills Survey 2009⁵⁴ reported that only 11% of employers who had recently recruited graduates perceived them to be either very poorly or poorly prepared for work, compared to 21% and 29% of employers recruiting college and school leavers

⁵³ HESA Destination of Leavers Survey.

⁵⁴ UKCES (2010a).

respectively. A small-scale CBI/EDI (2011) survey found that some employers continue to express concerns over the employability skills of graduates, not only in terms of core skills such as literacy and numeracy, but also in relation to team working, problem solving and self management.

Case study research for DfES (2007) illustrate a number of benefits employers report from graduate recruitment including:

- Challenging how things are done and coming at things from a different perspective;
- Using their initiative and acting without waiting for instruction;
- Problem solving and flexibility; and,
- Assimilating knowledge quickly and bringing new ideas and energy.

Vignoles, Machin and Galindo-Rueda (2003) find that a one percentage point increase in the proportion of the workforce holding degree-level qualifications rather than A-levels or equivalent qualifications in a sector led to an increase in sector productivity of 0.5%. In another study linking data from the National Employers Skills Survey and the Annual Business Inquiry, Galindo-Rueda and Haskel (2005) find that graduate-level qualifications exert a positive impact on output per worker measured at the firm level.

Skills and innovation

Human capital is widely recognised as being an important enabler of innovation within firms. Skilled individuals generate new knowledge and technologies which help drive innovation in new products and processes. Evidence from the US reveals a link between the share of the workforce with college degrees and the level of patents per capita, which serves as a proxy for inventiveness.⁵⁵ In addition to new products and processes, more skilled people are also able to adopt and adapt current technologies and make improvements to existing products and processes. The ability of skilled individuals to improve technologies and apply them to other areas is an important component of 'absorptive capacity', which the OECD (2010b) define as a firm's ability to identify, assimilate and exploit knowledge from the external environment.

Human capital may also facilitate innovation within firms if it leads to complementary investment in physical capital and ICT which have technology embedded within them. Finally, the spillovers associated with human capital in one firm may lead to further technological adoption and advancement in other firms within the sector or across the economy. Knowledge spillovers, however, can also be generated through geographic proximity, collaborations, spin-outs and consultancy. Abramovsky et al. (2007) find evidence to support the co-location of private sector R&D establishments and relevant university research departments, with the results being strongest for the pharmaceutical sector.

⁵⁵ Carlino and Hunt (2009).

Data from the UK Innovation Survey 2009 shows that firms who are innovation active are observed as having a higher proportion of their workforce with graduate level qualifications.⁵⁶ Amongst those firms who are innovation active, around 5% of the workforce are science graduates and a further 8% are graduates in other subjects. This compares to only 1% and 3% respectively in firms who are not innovation active. By sector, firms in research and experimental development were found to have the greatest share of science graduates, while financial services and creative industries had the highest share of other graduates amongst the workforce.

Table 4: Share of employees (%) who hold a degree in science or other subjects by firm size and innovation status, 2008

Firm size	Science graduates			Other graduates		
	Innovation active	Not innovation active	All	Innovation active	Not innovation active	All
Small (10-49)	5.7	1.6	4.1	9.4	3.6	7.2
Medium (50-249)	4.7	2.6	4.1	7.8	5.2	7.1
Large (250+)	5.3	0.9	3.4	8.1	2.3	5.7
<i>All</i>	5.2	1.4	3.8	8.3	3.2	6.4

Source: UK Innovation Survey 2009

Although attention is often given to graduate-level qualifications, and science and engineering graduates in particular, the types of skills required for innovation are more wide-ranging and difficult to define. In reviewing the literature, OECD (2010b) find a number of skill-sets are identified as being important for innovation including:

- Literacy and numeracy skills;
- Academic skills which are highly transferable across jobs;
- Technical skills that are more specific to certain occupations;
- A range of soft skills including team-working and communication; and,
- Management, leadership and entrepreneurial skills to help firms implement change.

⁵⁶ A firm is defined as innovation active if it has introduced a new or improved good or service or process for making or supplying them, has innovation projects they have abandoned or yet to complete, or has expenditure in R&D, training, acquisition of external knowledge or machinery and equipment linked to innovation activities.

There are a range of policies in place to support investment in the skills that may facilitate innovation and contribute to growth. Publicly funded research, for example, provides an important way of creating economic benefit to the UK economy, through the provision of a pool of highly trained people with both specialist knowledge and transferable skills to firms. Graduates bring enthusiasm and a critical approach that stimulate others and raise standards. The skills acquired during education are often a necessary precursor to the development of more specific skills, and provide a tacit ability to acquire and use knowledge in new and powerful ways.⁵⁷

Skills utilisation

There is a growing literature which argues that in addition to raising the stock of skills within the economy, the way in which they are utilised within the workplace is also important for achieving growth. There is no unique definition of what constitutes effective skills utilisation, but UKCES offer the following:

“Skills utilisation is about ensuring the most effective application of skills in the workplace to maximise performance, through the interplay of a number of key agents (e.g. employers, employees, learning providers and the state) and the use of a range of HR, management and working practices. Effective skills utilisation seeks to match the use of skills to business demands/needs.” (UKCES Ambition 2020: World Class Skills and Jobs for the UK, The 2009 Report).

For graduate-level qualifications, the evidence relating to the extent to which skills are being fully utilised is mixed. Research by Felstead et al. (2007) compares the supply of people with degree-level qualifications with a measure of demand derived from the number of employees who report that a degree is necessary to get their job, plus the number of graduate vacancies. From this comparison, they estimate that in 2006 there were 1.1 million more people with degrees than jobs requiring degrees.⁵⁸

By comparing the qualifications that individuals record as being necessary to get their jobs with the qualifications they hold, Felstead et al. estimate that 30% of graduates were ‘over-qualified’ in 2006 (compared to 40% of workers across all skill levels), an increase from 20% in 1986. It is important to stress, however, that this is an average figure taken across all graduates in 2006; in many cases, recent graduates are observed as over-qualified as a result of having had insufficient time to find a graduate job.

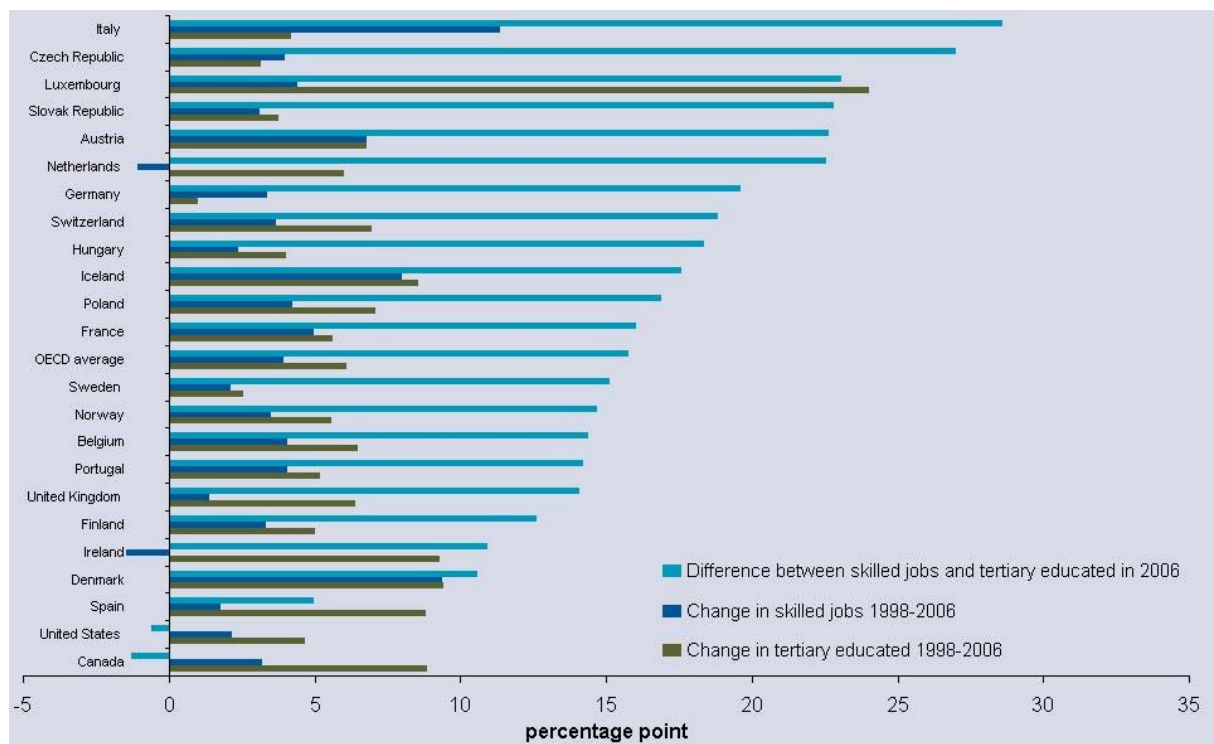
Research suggests that individuals who are observed as being over-qualified receive a pay penalty compared to similarly educated individuals who are in jobs which match their qualifications (although an over-qualified graduate may still earn more than someone holding lower level qualifications who is perfectly matched). Green and Zhu (2010) argue that growing numbers of over-qualified graduates amongst the lowest earners is an important factor in explaining the widening of the wage return amongst the highest and lowest earning graduates between 1994 and 2006.

⁵⁷ SPRU (2000).

⁵⁸ The supply is estimated to be 6.1 million and demand 4.9 million (with the number of jobs requiring degrees estimated at 4.8m and the number of vacancies around 100,000).

The OECD compare the percentage of working age individuals holding graduate-level qualifications with the percentage of the workforce employed in skilled occupations (given by the three highest occupational groups). In 2006, 30% of individuals in the UK held degrees and 44% of jobs were in high skilled occupations (compared to OECD averages of 27% and 42% respectively). The gap between skilled jobs and graduates was therefore 14 percentage points (given by the top bar in Figure 22), which was less than the OECD average.

Figure 22: Difference between skilled jobs and graduates in 2006 and the growth between 1998 and 2006



Source: OECD Education at a Glance 2008

Between 1998 and 2006, the percentage of people employed within skilled jobs in the UK grew by only 1.4 percentage points (second bar in Figure 22) while there was a growth in graduates within the population of 6.3 percentage points (third bar). This could partly be the result of a market adjustment where individuals in the UK invest in higher education as a response to observing that there are a relatively large number of skilled job opportunities, although the growth in skilled jobs remained low over the period compared to other countries.

Future drivers of demand for higher education graduates

Globalisation and technological change will continue to provide a basis for an increased demand for skilled individuals in the UK. Since the 1980s, global trade in goods and services has increased sevenfold, with the emerging economies share of global trade having quadrupled. As a result, global labour supply has also increased, primarily in the form of low skilled labour, which dominates the labour markets of

China and India. This trend is expected to continue, with the World Bank forecasting an additional 300 million unskilled workers to enter the global labour market from China and India by 2030.⁵⁹

The expansion of higher education in China and India has attracted considerable attention in developed countries, with the number of enrolments reaching 17 million and 12 million respectively in 2006/07. In China, around one-third (36%) of students take engineering and technical courses, potentially increasing their global competitiveness in these areas. However, some researchers (e.g. Gereffi et al., 2008) have argued that once consideration is given to the way subjects are defined and the relative quality of graduates, the high numbers of engineering students in China and India relative to the US, for example, is reduced.

Although the absolute number of higher education students in China and India is large, it is important to note that this is driven more by the size of their populations rather than a higher participation rate; tertiary enrolment rates are less than half those in advanced economies like the US, UK, France, Germany and Japan. Concerns have also been raised regarding the quality of Chinese and Indian graduates, measured in terms of their 'suitability for employment'. In a survey of multinational companies, McKinsey (2005) estimate that amongst engineering graduates for example, only 10% in China and 25% in India were considered suitable for employment in engineering related occupations, compared to around 80% in the UK, US and Germany. The main deficiencies identified related to language proficiency and a too narrowly focused education on theory rather than broader sets of skills.

The emerging economies, therefore, are likely to remain focused on low to medium skilled sectors, placing greater competitive pressures on UK firms currently trading internationally in these areas. The relative strength for developed economies like the UK is likely to be in more highly skilled sectors. Although the emerging economies continue to make progress in higher value-added activities, they face a number of constraints in moving up the value chain, including: the ability of the supply of high skills to keep pace with demand; access to finance; and protection of intellectual property.

The process of **technological change** has been one of the key drivers of the increased global trade in goods and services. Enhancements in technological capability have enabled firms to break down the production process into different activities which can be undertaken in different locations and across countries. Firms are therefore able to offshore low skilled activities to the emerging economies that have a rich supply of low skilled labour and instead specialise in the more skilled production activities like R&D.

Technological change is often thought to be **skill-biased** in that it leads to an increase in the demand for high skilled labour that complements the new technology relative to unskilled labour. Skill-biased technological change is widely considered to

⁵⁹ World Bank (2007) Global Economic Prospects.

be the dominant explanation for the widening earnings differential between skilled and unskilled labour. The IMF⁶⁰ has found that, since the 1980s, the earnings differential widened by around 25% in the US and also increased for Canada and the UK, but remained fairly constant for other European countries where it is sometimes argued that less flexible labour markets compress the wage distribution.⁶¹

The continuation of globalisation and technological change will influence the future UK labour market and the types of occupations and sectors individuals are employed in. The UK currently has a competitive advantage in knowledge-intensive sectors⁶² which is likely to continue to drive the demand for high skilled graduates. Evidence shows that there has been a movement towards more highly skilled occupations⁶³ – a trend that UKCES (2008) projections of the labour market expect to continue.

There are a number of limitations to any forecasts or projections of employment, including an in-built assumption that current trends are likely to continue. The projected outcomes therefore represent only one path the labour market could take, but other scenarios are also possible depending on the impact of policy interventions and the extent to which the UK is able to exploit opportunities in the global labour market. The most recent set of projections by UKCES were also undertaken before the extent of the economic downturn became apparent and are likely to understate the short term impact on employment. The results need to be treated with additional caution, but their analysis indicates that managers and senior officials, professionals and associate professionals could see employment growth of 1.7%, 1.5% and 1.4% per annum respectively between 2007 and 2017.

The evidence relating to the impact on low and medium skilled jobs, however, is more mixed. Some authors have argued that technology is not able to replace the human interaction and personal service associated with some low skilled jobs, but can replace the routine elements of medium skilled jobs which also face increasing competition from low wage economies.⁶⁴ This could lead to a “hollowing-out” of the UK labour market with demand for medium skilled occupations declining. Goos and Manning (2003) presented some data to support this hypothesis over the period 1979 to 1999 in the UK. Over the period 2002 to 2008, Bell and Blanchflower (2009) also find a reduction in the employment share of medium skilled jobs, but their analysis also indicates a fall amongst the lowest paid jobs. In addition, the UKCES (2008) analysis indicates a decline in employment of the lowest skilled occupations over time.

UKCES (2010b) show that amongst the top 20 fastest growing occupations between 2001 and 2009, graduate level qualifications were the predominant qualification required for the job in around half of the occupations identified. Overall, the report identifies a range of high, intermediate and lower level skills that are important for economic growth along with a set of wider generic skills including management and

⁶⁰ IMF (2007).

⁶¹ Steelman (2005).

⁶² BIS (2010) Economics Paper No. 9.

⁶³ Elias and Purcell (2009).

⁶⁴ See for example Autor, Levy and Murnane (2003) and Blinder (2007).

leadership (see Box 2). For higher level skills, professional skills in sectors like computing, health/social care and medical technology are of particular importance along with STEM skills in manufacturing, and in research and technology.

Box 2: Management and leadership skills

Managers have an important role to play in firms competing in the global economy by identifying the goods and services to be produced and ensuring that all resources, including human resources and talent, are deployed in the most effective way to deliver these product market strategies. Some commentators have argued that the UK has a relative weakness in management capability which acts as a brake on economic competitiveness. However, there are few international comparisons of management skills and those that do exist often rely on reported perceptions of the quality of management within firms.

One of the most influential studies by CEP/McKinsey (2007) is based on a number of surveys of medium sized manufacturers across a range of countries. Their work has shown that management capability is correlated with a range of measures of business performance, including labour productivity, and that the UK ranks below key competitors such as the US, Germany, Sweden and Japan.

Although good managers can develop as a result of innate ability or on-the-job experience, graduate-level qualifications have also been linked to greater levels of management capability within firms. For example, CEP/McKinsey show that the percentage of managers educated to degree-level is positively related to the overall score of management quality within firms, and that the UK has a lower proportion of managers holding degrees than other countries, for example, Japan.

As identified by UKCES, STEM skills are commonly reported as being amongst the most important skills for economic growth through the effect they have on innovation and knowledge transfer. In a small CBI/EDI (2010) survey of 684 employers, almost three-quarters seek to employ individuals with STEM skills. Employers are reported to value STEM-skilled employees for their technical competence, analytical skills and problem-solving skills. Research commissioned by BIS (2011) also finds that employers seek a range of skills including academic excellence in science and engineering, mathematical skills, communication and problem-solving skills.

Between 2002/03 and 2009/10, HESA student record data indicates that the number of first degree qualifiers in STEM subjects increased by 22.4% from 118,105 to 144,545 (although there was a decline of 21.8% in Computer Science). Over the same period, the number of non-STEM qualifiers increased by 30.6% (from 154,290 to 201,445), meaning that overall the percentage of all first degrees awarded in STEM subjects fell slightly from 43.4% to 41.8%.

Box 3: Strategically important and vulnerable subjects

HEFCE (2010a) report annually on the demand for and supply of strategically important and vulnerable subjects which are broadly defined as STEM, modern foreign languages and quantitative social science. Between 1999/2000 and 2007/08, the number of full-time equivalent undergraduates across all subjects increased by 18% while SIV subjects experienced a growth of only 2% over the same period, with a notable decline between 2002 and 2005. Over the last three years, however, the pattern for SIV subjects has been mixed, with some growing and others declining, for example:

- The number of physics, chemistry and mathematics FTE undergraduates has grown at a faster rate than the average across all subjects – 5%, 12% and 5% respectively;
- Across all Engineering and Technology undergraduates, the number fell by 2%. However, there is significant variation within this group with Chemical and Civil Engineering growing, but Electrical, Electronic and Computing Engineering falling; and,
- Although there is also variation by subject, Modern Foreign Languages experienced a decline of 4% over the last three years.

Surveys of employers frequently identify the importance of STEM graduates for their broad numeracy skills as well as specific technical knowledge of a subject. Research by HEFCE for the Annual Report finds that advances in technology and the continued global fragmentation of activities like research and design which requires individuals to work in virtual teams is placing even stronger requirements on the quality of HE graduates.

Conclusion

Higher education enhances the stock of human capital which contributes to growth at both the national and local level. For individuals, there are substantial benefits arising from improved labour market prospects, with the most recent estimates indicating that graduates earn over £100,000 more (net of taxes and in today's prices) over their lifetime than someone holding two or more A-levels as their highest qualification.

The wage premium received by graduates has remained fairly stable over time, suggesting that as HE has expanded and the supply of graduates in the economy increased, there has also been a corresponding increase in demand. Over the long-term, the continuation of globalisation and technological change are likely to create additional demand for highly skilled individuals, maintaining the returns to a graduate education. The following two chapters look at the evidence relating to some of the wider benefits to HE, beyond the private returns received by graduates, and the contribution it makes to promoting social mobility.

3. Wider Benefits from Higher Education

Summary

In addition to the contribution to economic growth outlined in Chapter 2, higher education has an important impact on a wider range of social factors. This chapter examines the breadth and scale of these non-market effects.

Higher education, along with education and skills more generally, has been shown to contribute towards improved health, changes in parenting behaviour, greater levels of social cohesion and civic engagement, and regional development. However, determining the overall size of these non-market benefits and whether, on average, it is individuals or society who captures most of the benefit is still relatively problematic.

Introduction

The previous chapter showed the role played by higher education in generating economic growth. But the benefits of education go beyond this to include the wider well-being of society. This encompasses social and cultural benefits accruing not just to graduates but their families, communities and society as a whole. This makes a strong case for the intrinsic benefits of higher education over and above its economic impact, by growing the social capital of a country. In this sense HE has an important role to play in the government's 'Big Society' agenda.

What do we mean by wider benefits?

Non-market effects of higher education can be thought of primarily as social externalities (where one individual's higher education can affect other people) and private non-monetary benefits that accrue to the individual or their family separately to income. Whilst the latter group are captured by the individual – fully rational behaviour would suggest expected benefits for, say, one's own children form part of the decision whether to participate in higher education – short-term horizons, lack of information or uncertainty may mean they are not taken into account in prospective students' decision making. Chapter 5 looks at the consequences of this type of imperfect information in higher education in more detail.

How are wider benefits transmitted?

Studies on the wider impact of higher education often differentiate between effects which change behaviour directly and the more indirect effects of learning which occur via other factors such as a graduate's income. In reality, though, these two explanations can overlap.

Direct effects can occur because of a change in the preferences or behaviour of graduates that would otherwise not have taken place. The Centre for Research on the Wider Benefits of Learning (2006) suggests direct changes engendered by higher education may be realised through three main channels:

- Development of personal characteristics and skills;
- Social interactions; and,
- Accreditation and signalling benefits.

The exact mechanism by which HE changes behaviour is uncertain but Feinstein (2002) suggests the HE learning environment may help develop traits such as risk aversion or empathy.

On the other hand, indirect effects of higher education occur as a result of other factors associated with graduates. For example, on average, graduates receive a wage premium, whose spending power may prove an important determinant of some social outcomes. Higher income may change the opportunities available to individuals, their consumption choices, the neighbourhood in which they live, their state welfare costs and their housing quality. Other indirect effects may occur through occupational choice or other similar factors that can have a subsequent impact on social outcomes such as attitudes or health. Although they represent ‘knock-on’ impacts, indirect effects can be substantial.

Empirical findings

Methodological issues in estimating wider benefits

When attempting to measure the non-market impact of higher education, it is important to distinguish between correlation and causality. Simply comparing social outcomes or behaviours of graduates with those of non-graduates is likely to be inadequate because the two groups may differ in ways other than attendance at HE. If these other variables are not taken into account, a selection bias can result which would distort the estimated effect of higher education.

Other sources of bias can arise when attempting to test for wider benefits, including:

- Measurement error caused by non-homogenous higher education;⁶⁵
- If education is undertaken merely to signal pre-existing ability; and,
- Endogeneity, where the decision to enter higher education is partly dependent on the social outcome being tested.

⁶⁵ Survey results typically only indicate the level of education obtained, but there are many differences within a single education category. Measurement error creates ‘noise’ in the data, leading to a downward bias in the estimated coefficient of that variable.

McMahon (1998) finds from a review of many studies on all levels of education that the two principal sources of estimation bias (upward bias from omitted variables and downward bias from measurement error) are usually of roughly the same magnitude and so effectively cancel out. However, measurement error will vary according to the particular study and education system being studied, so this rule of thumb is not sufficient for all situations.

Therefore, to overcome the remaining estimation problems, researchers attempt to isolate the effect of attending higher education by controlling for other explanatory variables and exploiting data sources such as longitudinal surveys or studies of identical twins. As some relevant factors (such as inherent ability,⁶⁶ motivation or time preference) are hard to control for, even thorough statistical studies are subject to uncertainty as to the actual causal effect of HE, creating considerable debate in this field.

Non-HE findings

Many studies on social externalities refer to education and skills as a whole rather than higher education specifically and a clear picture emerges of benefits linked to increasing qualifications at all levels. The Centre for Research on the Wider Benefits of Learning (2006) summarise the main findings from the recent literature. School level education and qualifications have been shown to reduce the risk of adult depression, increase tolerance for other members of society, reduce community crime levels and lead to higher self-reported measures of health. Related benefits have similarly been found for adult learning and qualifications below degree level.

For instance, engagement in adult learning is linked to a wide range of health and social benefits including smoking cessation, increased exercise, reduced obesity, increased social and civic engagement, participation in voluntary activities and improved parenting skills (Feinstein and Hammond, 2004; Feinstein, 2002; Tett and Maclachan, 2007; La Valle and Blake, 2001; Dench and Regan, 2000; Barton et al, 2007). There is also good evidence of benefits to individuals including improved life satisfaction and increased personal confidence. In a recent evaluation (LSC, 2009) those who had completed an apprenticeship reported a wide range of benefits including improved social, team working and communication skills (91%), more confidence in abilities (94%) and improved quality of life (76%).

This is supported by quantitative international evidence. For instance, an additional year of education is estimated to reduce the probability of US young people dying in the subsequent ten years by 3.6 percentage points (Lleras-Muney, 2005), via an effect on an individual's health. In addition, Lochner and Moretti (2004) find school education has a causal, negative effect on crime.

Many of the mechanisms by which wider benefits are realised are the same across all types of education, but there are some fundamental differences. Most notably, the counterfactual is different – the effect of leaving school early is very different from not

⁶⁶ The unobserved nature of inherent ability makes it the primary source of uncertainty in most studies of the returns to education.

attending higher education. Also the nature of education changes markedly from school or college to higher education, so attitudes and behaviour are likely to be affected in different ways. It is also likely that at some point the social benefits of additional years of education face diminishing returns; so the results may not be applicable for every marginal year of education.⁶⁷

HE-specific studies

As noted, a clear picture emerges from the research of a range of wider benefits linked to increasing qualifications at all levels. However, many studies have been able to focus on higher education and degree qualifications. Bynner et al. (2003) study the link between education level and a range of potential social benefits using data from the National Child Development Study (NCDS). The relatively rich nature of the data allows for statistical controls to be added for a range of factors to reduce the possibility of omitted variable bias.⁶⁸ The cohort study also allows the authors to test whether outcomes persist over time and a separate British Cohort Study (BCS) dataset allows a test of whether the original results also hold for a later cohort of individuals. The results from this and other relevant studies are provided in the following sections.

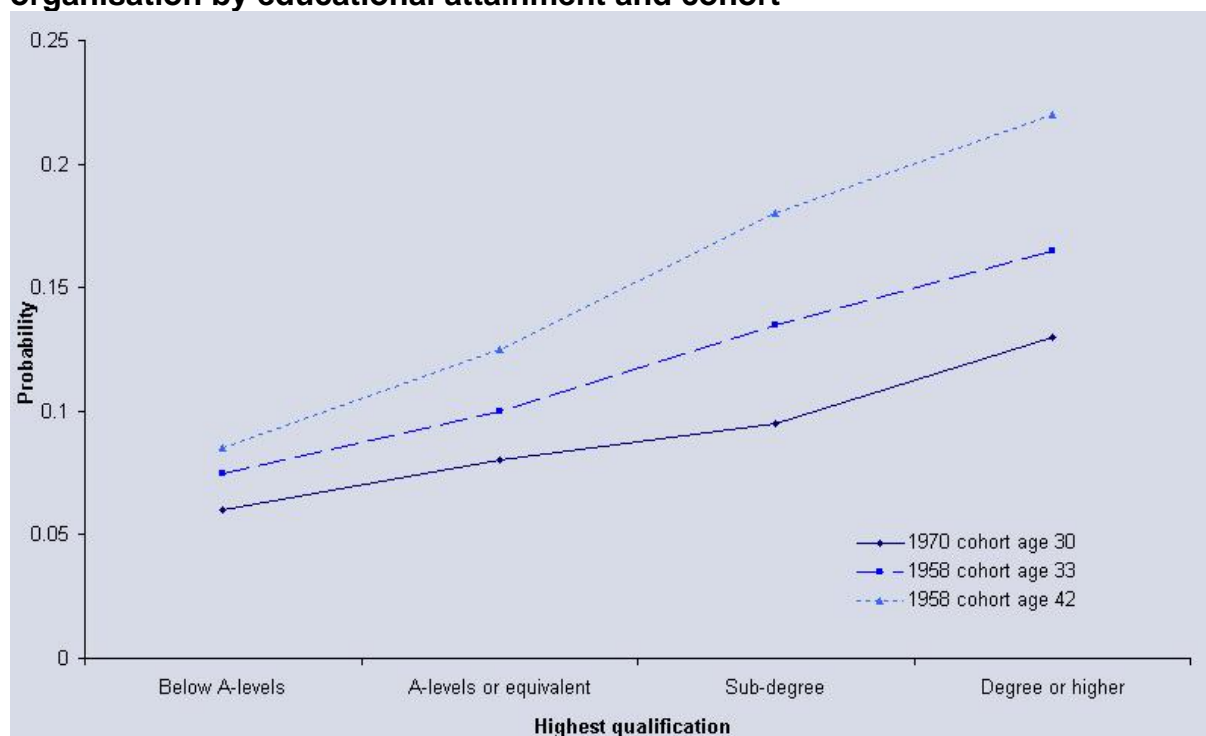
Civic engagement

Bynner et al. (2003) find higher education increases the chance of an individual being a member of a voluntary or charitable organisation. Adjusting for other factors, higher degree graduates are over one and a half times more likely to be a member of a voluntary organisation at age 42 than someone with A-levels or equivalent as their highest qualification (Figure 23).

⁶⁷ Alternatively the opportunity costs of being out of the labour market accumulate, which would eventually render social rates of return negative.

⁶⁸ The inclusion as controls of reading and maths scores at age 10/11 should go some way to control for unobserved ability bias (i.e. the authors' results are not the result of differential cognitive ability at this age). However it is not clear how close the measures approximate to more well-known controls such as IQ. Therefore the degree of causality cannot be fully inferred, but, given the range of other family-related control variables, the results appear robust.

Figure 23: Probability of having ever been a member of a charitable organisation by educational attainment and cohort



Source: Bynner et al. (2003)

Note: Probabilities are adjusted results of logit regressions including control variables

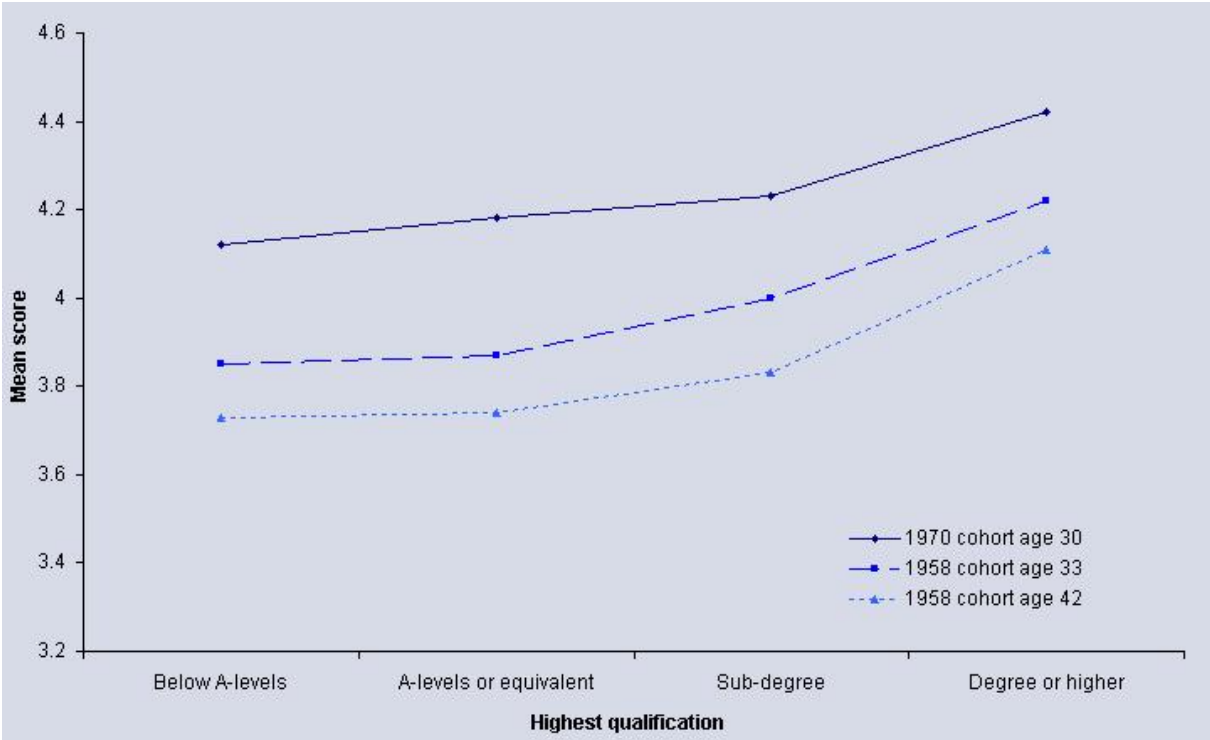
Using US data, Dee (2004) finds a statistically significant effect of education (at all levels rather than HE specifically) on subsequent support for free speech and the frequency of newspaper readership. Going further, Keller (2006), using a cross-section of countries, finds higher education to be the largest single determinant of a country's democratisation.⁶⁹

Attitudes

Higher education also affects the attitudes and behaviours of graduates. Figure 24 shows the estimated effect of qualifications on a measure of racial tolerance, after having adjusted for other explanatory variables (Bynner et al., 2003). The positive effects of higher education on racial tolerance are clear and appear to be maintained over the course of respondents' lifetime and in different age cohorts.

⁶⁹ This finding is more relevant less developed countries. The direction of causality between education and democratisation has also been subject to debate.

Figure 24: Adjusted score for race tolerance by educational attainment and cohort



Source: Bynner et al. (2003)

Notes: Scores compiled from Likert scale survey questions in NCDS and BCS adjusted for other factors in regression analysis. Higher score reflects more positive attitude towards people from other races.

In the same study, higher education is found to explain a more critical engagement with authority but, at the same time, also a lower degree of political cynicism. The latter characteristic was borne out by a higher probability of voting amongst those who had attended higher education, controlling for other possible explanatory factors.

International evidence is similarly supportive - Dee (2004) finds a positive effect of qualifications on voter participation in the United States. OECD (2010) find tertiary education is associated with higher levels of interpersonal trust in a cross section of industrialised countries.

Attitudes and civic engagement – mechanism

The findings above, indicating a causal effect of higher education on civic engagement and attitudes, are likely to represent direct effects of higher education, i.e. systematically different behaviours seen amongst those with higher qualifications. Given this, these findings provide valuable evidence to support the intrinsic importance of higher education and its contribution to civic and cultural society.

These results also suggest that higher education may have a role to play in reversing the decline in social capital observed over the last three decades of the twentieth century (Putnam, 2000). Trust and group interactions are central to Putnam’s theory

of social capital, so the fact that HE courses require, or at least facilitate, participation in formal or informal groups and networks is important. However it is also possible that the growth in higher education has been part of the fall in social capital as a result of inequality between those that attended HE and those that did not, though there is currently little hard evidence with which to assess this question.

Parenting and intergenerational effects

There are a number of studies pointing to an effect of higher education on a graduate's children. Using British Household Panel Study data from the early 1990s, Ermisch (1999) finds that a mother's education is a strong predictor of her children's educational achievements, particularly for daughters. Controlling for other factors, if a mother's highest educational qualification was a university degree, the likelihood of her child obtaining a degree was 67% compared to only 12% if her highest qualification was an O-level.

There is also evidence of more direct effects within the home. Bynner and Egerton (2001) find that graduates, adjusted for all other factors, are half as likely to see educational difficulties in their own children, compared with parents educated below A-level. Feinstein and Duckworth (2006) find mothers' participation in post-compulsory education has small positive causal effects on the provision of an educationally stimulating environment for their children. Similarly, Bynner et al. (2003) show participating in HE is associated with higher cognitive ability scores and fewer educational difficulties for one's offspring, although the statistical significance for these parenting factors is not as high as for the authors' other indicators.

Corroborating these UK findings, many studies from other countries find a positive causal link between an individual's education and the health status and educational attainment of their children.⁷⁰ Of particular interest is Lillard (1993) who examined the determinants of college enrolment in the United States using a longitudinal survey covering the 1970s and 1980s. Aspects of a neighbourhood's human capital (i.e. the average education level) are found to affect the probability of a student raised in that neighbourhood going on to enrol in college. This provides important evidence of peer effects from higher education which go beyond the family to a graduate's local community.

Within-family effects may also not be confined to offspring – Cutler and Lleras-Muney (2006) cite studies where, even controlling for education, those married to more educated spouses have lower mortality rates. Grossman (1975) finds a woman's education to be a significant predictor of her husband's health. However in general, the literature on spousal effects is mixed. If an effect exists, it is likely to be connected with healthy lifestyle factors which are discussed in the next section.

⁷⁰ See Haveman and Wolfe (2001) for a summary.

Parenting – mechanism and economic impact

The results above suggest that, in general, children of graduates benefit in their childhood development. One reason is that higher education may affect the choices and investments made by parents. Supporting this, Bynner et al. (2003) find graduate parents (controlling for other factors) read more to their children and own more books than non-graduates. Another theory is that there are direct effects of education on parental well-being and graduates' willingness to pass on beliefs and aspirations.

Indirect factors such as income may also play a role (e.g. if graduate parents' higher earnings are used to purchase goods that enhance childhood development) although there is limited evidence for this. Feinstein and Duckworth (2006), however, attribute part of the parenting observations to uncorrected selection bias (as factors underlying cognitive ability are especially difficult to control for by standard means), claiming children of graduates inherit propitious unobservable characteristics which overstates the effect of HE. Overall there is no clear-cut evidence as to what underlies the parenting results.

On the economic impact of higher education on parenting, Haveman and Wolfe (2001) calculate a monetary estimate for the UK of the finding that a mother's education increases the chance of her children attending higher education.⁷¹ Since more childhood education raises human capital and income on average, this creates a potential measurable monetary value. The marginal value of a mother's first or higher degree on their child's time spent in education is estimated to be £1,200 and £1,700 respectively⁷² per person. Given the fairly limited scope of the study, this result implies parental higher education is likely to have a substantial overall economic value.

Health and longevity

Controlling for a range of other variables, Bynner et al. (2003) find graduates to be less depressed (measured on a common psychological survey scale) than both those with A-levels as their maximum qualifications and with qualifications below A-level (the gap being larger with the latter group). Higher qualifications also have a statistically significant negative effect on obesity levels.

Similarly, self-perceived health is also found to increase with an individual's highest qualifications. The estimated effect is large - those educated to degree level or higher are between 70-80% more likely to report 'excellent' health, compared with a similar individual educated to level 2 or below. The authors, however, find no statistically significant results for common individual health conditions (as measured by incidence of bronchitis, asthma, stress and cancer), raising the possibility that better self-

⁷¹ As found in Ermisch and Francesconi (2000).

⁷² Figures unadjusted for inflation since time of study.

reported health amongst graduates reflects general feelings rather than an objective measure of health status.⁷³

In the United States, Grossman (1975) examines health using longitudinal data of military veterans. Those men who undertook post-secondary degrees reported systematically better health in later years than those of the same ability who finished high school. Johnson (2010) finds similar effects of college education on self-assessed health status in the United States using more recent data, and Bolin et al (2002) finds the same effect from Swedish data.

Better health also makes considerable improvements to people's quality of life and longevity. Cutler and Lleras-Muney (2006) find US life expectancy increases by 0.6 years for every additional year of education.⁷⁴ In addition Grossman (1975) finds one year of college reduced the probability of death between 32 and 46 years of age for men in the US by 0.4%.⁷⁵ These studies are important because they point to a real health effect, borne out by greater longevity, rather than just increased personal sense of health status.

Healthy behaviour

A large part of the impact of education on health is the result of lifestyle factors, for which there are a number of findings. Bynner et al. (2003) find that first and higher degrees (the effect is not as strong for sub-degrees⁷⁶) are associated with a lower incidence of smoking, although not necessarily the amount smoked. Controlling for smoking behaviour at age 16, non-graduates educated to level 3 are around 50% more likely than graduates to be a smoker at age 30.

An interesting case is provided by those who enrolled but subsequently dropped out of higher education. Amongst this group the adjusted smoking and obesity indicators exhibit worse outcomes than all other groups. This set of people had the necessary qualifications and ability to attend higher education but went on to make much less healthy lifestyle choices.

In the United States, de Walque (2004) finds college education for individuals born in the US between 1937 and 1956 decreases the prevalence of smoking from 52% to 48%, as well as increasing the probability that a smoker will be able to stop. Likewise being able to enrol in college and stay for a minimum of two years decreases the probability of smoking during pregnancy by 5.8 percentage points amongst women who were on the margin of joining higher education (Currie and Moretti, 2003).

⁷³ Johnson (2010), however, states that standardised self-reported health questionnaires are highly accurate predictors morbidity and mortality.

⁷⁴ The authors use total years in education rather than identifying HE specifically.

⁷⁵ There are no straightforward comparisons of life expectancy for graduates and non-graduates in the UK. In any case, such statistics would not control for other potential common characteristics as the quoted results do.

⁷⁶ This group includes BTECs, Higher Education Diplomas and full professional qualifications amongst others.

Health - Mechanisms

Higher average income is one potential driver of healthier lifestyle choices. For example, certain health-enhancing consumer goods⁷⁷ may be more income elastic than others (i.e. they are consumed disproportionately as income rises). Similarly, wealthier individuals may consume more healthcare, although in the UK this effect would be mitigated by a health service that is free at the point of use. Also related to income, graduates have a higher opportunity cost of ill health (for instance a spell out of the labour market will be more costly for those with greater earning potential or job satisfaction) and therefore face a market incentive to lead a healthy lifestyle. OECD (2010a) confirm that self-reported health effects of tertiary education fall when income is introduced to regression analyses, suggesting it does play a significant role.⁷⁸

Apart from income, there are other indirect mechanisms which could explain the link between higher education and health. For instance, graduates may be proportionally more likely to choose careers with lower occupational hazards or live in less polluted areas and higher quality housing (Haveman and Wolfe, 2001).

However, in a thorough quantitative study of all levels of education, Grossman (2006) concludes “a very significant portion of this schooling effect [on health] cannot be traced to income or occupation” (p.33). This suggests there are also some behavioural aspects behind the causation. One possibility is that education increases how much one cares about the future and therefore graduates may pay more attention to lifestyle factors that will affect their quality of life in the future. Kenkel (1991) provides some evidence to support this time preference argument. Knowledge of health matters could also play a role – McMahon (2009) summarises a range of studies which point towards more educated individuals staying informed about health matters and becoming wiser and more frequent consumers of healthcare.

These explanations are consistent with economics of information theory, where education helps individuals become more well-informed customers, and also behavioural economics where more educated individuals would be better placed to understand and act on evidence. In both cases this could translate into a health benefit.

Health – economic impact

Improved health outcomes have direct benefits for government by reducing the expenditure needed to treat preventable illness. Smoking-related illness alone has been estimated by one study to cost the NHS £5bn per annum.⁷⁹ In aggregate these benefits are likely to be substantial if the results above do indeed reflect a causal relationship between higher education and health and healthy behaviour.

⁷⁷ This could refer to some healthier foods, gym memberships etc. (Groot and Maassen van den Brink, 2006).

⁷⁸ Note Bynner et al. (2003) do not control for income.

⁷⁹ See Allender et al. (2009).

In addition, applying a conservative value of health (as can be derived, for instance, through Quality-Adjusted Life Years) to the increased quality of life or life expectancy found in the studies above, would suggest the market value of the health effects caused by higher education are substantial.

Regional impacts

Many of the positive externalities discussed in the preceding sections will also have regional impacts. In addition, universities and students contribute to local and regional communities in a number of different ways.

Regarding community involvement, Bond and Paterson (2005) find, from a UK survey, that individual academics exhibit a strong commitment to engagement and interaction with their communities in principle and in practice. This interaction with the non-academic community is widespread and varied in form, including interactions with schools, businesses, the media, governmental or non-governmental bodies at a national level, and community groups or organisations at a more local level.

HEIs themselves directly provide cultural and welfare services to their local communities. Similarly, the arts and culture sector benefits from infrastructure and services originating from universities and HEIs. The most recent evaluation of third stream funding (resources to encourage interaction between HEIs and external organizations and wider society) found that “social, community and cultural events represent one key area of the societal impact of HEIs. Overall, the number of attendees at most types of events, both free and chargeable, grew over the period 2004 to 2007”.⁸⁰ Quantifying these benefits however, is problematic, as there is relatively little understanding of the full effects of cultural interaction – many of the effects are intangible and for others there is limited information on willingness to pay.

Other factors

Higher levels of education may increase the efficiency of consumer choices (such as choosing investment products in times of high inflation) which have positive effects of well-being similar to those of money income (Haveman and Wolfe, 2001). Weale (1993) also provides a reminder of the relevance of education as a consumption good, enhancing individual’s leisure in its own right.⁸¹ The knowledge gained by undertaking a degree could also have network externalities through social interactions (Lange and Topel, 2006).

Education beyond the compulsory secondary level has also been found to be associated with reduced crime. A study for the Department for Education and Skills (Feinstein and Sabates, 2005) found male juvenile convictions for burglary per thousand population were between 1.1 and 1.5 lower in areas where policies were

⁸⁰ HEFCE (2009) p.11.

⁸¹ Whilst these benefits could be substantial, there is little evidence on the issue.

introduced to encourage teenagers to remain in school, compared to untreated areas. Crime reduction has a large economic and social benefit, but the evidence regarding higher education, as opposed to school level education, is limited.

Not all social externalities of higher education have been found to be positive however – increased education is associated with a higher divorce rate amongst women⁸² (Becker, 1981), a higher propensity to try illicit drugs (Cutler and Lleras-Muney, 2006) and ‘white-collar’ crime (McMahon, 1998). Finally, higher consumption of healthcare, meanwhile, may have long-run benefits but can impose large short-run costs.

Quantifying non-market benefits

The previous sections have shown that there is strong evidence to support the argument that higher education has a causal effect on a number of social benefits. A question arises, therefore, as to the aggregate size of the non-market benefits and, importantly, how much graduates benefit privately as opposed to how much society as a whole benefits. The distinction between private returns and externalities is important because it helps determine the optimal choice of higher education funding (Chapter 5 explains this in detail).

The work of US economist Walter McMahon (1998, 1999, 2009) has made some of the most ambitious advances in quantifying the overall rates of return from higher education. The author attempts to place a monetary value on consensus findings from academic literature, primarily using an income-equivalence method of valuation. This method estimates how much expenditure would be required to achieve the same social outcome as HE is hypothesised to cause by alternative means. Taking the example of improved parenting behaviour, the alternative means could be increased monetary ‘inputs’ to child development such as private tuition or government expenditure on early-years education.

McMahon (2009) concludes that non-market private benefits (including own health, longevity, child cognitive development and happiness) and social externalities (including democracy, attitudes and reduced state expenditure on healthcare) together sum to more than the average graduate wage premium. The two factors together are estimated to total more than twice the earnings increment of a bachelor’s degree in the United States.

A recent study by the New Economics Foundation (2011) applied a cost benefit analysis tool, Social Return on Investment, to highlight and calculate some of the broader UK-wide public benefits using case studies at two UK universities. Broadly, it used 2 approaches – contingent valuation and revealed preference pricing – to calculate monetary values for community outreach and cultural enrichment programmes; public gains through social mobility; and other societal impacts such as

⁸² This may reflect, however, greater financial freedom amongst females.

greater levels of interpersonal trust, political interest and reported good health. The report recognised that there is a considerable amount of work to be done to develop appropriate agreed methodologies, but noted the importance of universities gathering better information on the wider benefits that they deliver.

In another study, Haveman and Wolfe (1984), using their own analysis and a review of other literature, conclude that a conservative estimate of the value of non-labour market effects of education to be "of the same order of magnitude as estimates of the annual marketed, earnings-based effects of one more year of schooling" (pp. 400-401). The authors maintain the same conclusion in subsequent papers.

Similarly, Grossman (2006) estimates that all of the health-related impacts of higher education, including own health, effects on child health, spousal health and longevity are collectively worth around 100% of the average increment to earnings in the United States. Looking at the same factors, McMahon (2009) concludes them to be worth 98% of the wage return. Given there is considerable uncertainty in quantifying these effects, these two results exhibit strong consistency.

It is not just the average but also the distribution of non-market benefits that is of interest (i.e. to what extent they vary across different groups of graduates). Unfortunately there is little UK evidence on this question, but Junankar and Liu's (2003) study of Indigenous Australians implies that the non-market benefits of increasing higher education participation amongst disadvantaged groups could be significantly larger than the average. The authors' results are primarily related to a lower counterfactual amongst the disadvantaged groups studied.

Taken together, these findings provide a consistent picture of the aggregate effect of all the wider benefits raised in this chapter being collectively worth as much or more in financial terms as the more well-publicised wage returns from higher education. It must be noted, though, that these quantification studies can be controversial which is covered in more detail below.

Private versus social returns

Regarding to whom benefits accrue, it is clear that many of the effects in the earlier sections represent private benefits rather than externalities. Health, for example, is often thought to constitute part of an individual's wellbeing and their human capital. Therefore if graduates experience health benefits as a result of their education, a substantial portion of this should be reflected in their utility or their income.⁸³ So findings such as Grossman's (2006) conflate private and social benefits.

McMahon (2009), however, attempts to fully separate social and private benefits. Using his income-equivalence approach, he estimates the present-value monetary value of private non-market benefits in the US to be around \$38,000⁸⁴ per year and social benefits to be around \$28,000 per year. This compares to the author's

⁸³ In this example, though, there are still positive externalities through reduced NHS expenditure. In general the distinction between private and social non-market benefits is not likely to be exact.

⁸⁴ All figures are in 2007 dollar terms.

estimated annual private market return of \$31,000.⁸⁵ These results would mean social external benefits total around 40% of the total private benefits. In addition, the author runs dynamic simulations to estimate the interaction and knock-on consequences of all private and social benefits. This increases the estimated proportion of total benefits that are social to around 50%.

However, there are reasons why these findings might not fully reflect reality. Firstly, the research is constrained by what it can quantify – social capital and own happiness are not included within the estimates because there is no satisfactory data by which to measure them. But putting a per-degree monetary benefit on factors such as democracy (\$1,830) and political stability (\$5,813) can also be seen as controversial, as the benefit from institutions is not normally considered in marginal terms. There are also questions over some components of the results – the monetary benefit of reduced crime in particular is very sensitive to the assumption of the marginal effect for higher as opposed to earlier education – and to what extent they can be applied internationally.

Overall there has been an insufficient volume of research to conclusively determine the relative size of private and social benefits. McMahon (2009) (and other studies he summarises) provide a clear indicator that private non-market benefits are likely to be of comparable magnitude to the graduate earnings premium and that social benefits are also highly substantial, if intrinsically less quantifiable. Because of the ongoing estimation problems, however, more research is needed to reach a consensus on this distinction.

Conclusion

Although research into wider benefits is subject to uncertainty and debate, higher education seems to make a significant contribution to a range of social and well-being factors. The relationship between higher education and non-market benefits is in part indirect – occurring via higher income or living arrangements – but there is also evidence of direct relationships driven by changes in behaviour, preferences and attitudes.

There has been some work on determining the overall financial impact of these findings but there is considerable scope for future research. Those quantitative studies that do exist suggest graduates experience strong private non-market returns, but a consensus on the distinction between these and genuine externalities has not been reached, so there remains some uncertainty. It is clear, though, that, on average, graduates and society both experience large non-market returns from the provision of higher education.

⁸⁵ This figure should not be compared to the private returns in Chapter 2 as the calculation method is different. What matters here is the relative size of the figures from the same study.

4. Higher Education and Social Mobility

Summary

Social mobility broadly refers to the movement – both up and down – of individuals between different socio-economic groups. Intergenerational mobility is concerned with the relationship between the socio-economic status of parents and the socio-economic outcomes of their children as adults. There is general agreement that there was an increase in upward social mobility in the UK in the years after the war, driven by the general improvements in occupations, which then became steady (or possibly decreased) for men while continuing to increase for women. International comparisons are difficult but the UK tends to be low or middle-ranking based on different measures. A number of factors are argued to influence the rate of mobility including cognitive factors, parental influences, social capital, early labour market experiences and income inequality. Education is generally agreed to be an important factor in determining an individual's mobility, with the role of higher education particularly highlighted as a route to higher earnings and social status. Over the past 15 years there have been considerable improvements in widening participation in HE to young people from disadvantaged backgrounds. However, these improvements have not been uniform across the HE sector with the participation rate of the most disadvantaged young people in the most selective universities virtually unchanged over the same period.

Introduction

Social mobility can be defined and measured in a number of ways, but broadly refers to the extent to which life achievements are determined by a person's starting position in life. Generally the focus has been on the ability of individuals from disadvantaged backgrounds to 'move up in the world', but it is also important to note that increasing the upward mobility of more disadvantaged groups can imply downward mobility for more advantaged groups. There has been a general acceptance that increased mobility is desirable from an equity perspective, however, there is considerable debate about what level is desirable or possible, how it should be measured, and what are the most effective and efficient mechanisms for achieving it. Also, there is no clear picture of the relationship between social mobility and economic growth.

The Government has recently published its Strategy for Social Mobility (HMG, 2011) which confirms social mobility as being one of the principal goals of social policy, and presents a wide range of evidence on social mobility in the UK.

Definitions and measures of social mobility

Social Mobility refers to the movement of individuals from one position in society to another. It can refer to the likelihood of children being in a different class/position than their parents (inter-generational mobility) or the mobility of an individual within their lifetime (intra-generational mobility); most analyses focus in inter-generational mobility. It can be measured in absolute or relative terms: how well a whole generation is doing compared to a previous one, or comparing the chances of children from lower class backgrounds prospering (relative to their parents) compared to those from higher class backgrounds, respectively.

Originally social mobility tended to focus on changes in social class/socio-economic status/occupational status – characterised by factors such as wealth, ownership, labour market position, and concepts such as social and cultural capital. More recently analyses have been undertaken using measures of income, considering movement between different parts of the income distribution, usually split into quartiles. It is worth noting that, since social classes can and do change in size over the years, it is possible that absolute and relative levels of upward mobility (as measured by social class) can all increase if the overall size of the higher social classes increase – and there is evidence that this was the case for much of the last century (Heath and Payne, 1999). The use of income quartiles, by definition fixed in size, means that upward income mobility for some is inevitably mirrored by downward mobility for others.

Other aspects of mobility are sometimes considered – such as educational attainment or quality of participation in the labour market, though these are often taken to be leading indicators of social mobility. Also, most analyses tend to focus on fairly large groupings within society rather than being able to identify the “top or bottom 1%”, although it appears that mobility tends to be very low at the very top and very bottom of the income distribution.

The following sections review the historical patterns of social mobility and international comparisons before considering the factors that may affect it (including the central role of higher education) and the latest indicators relating to widening participation and improving fair access.

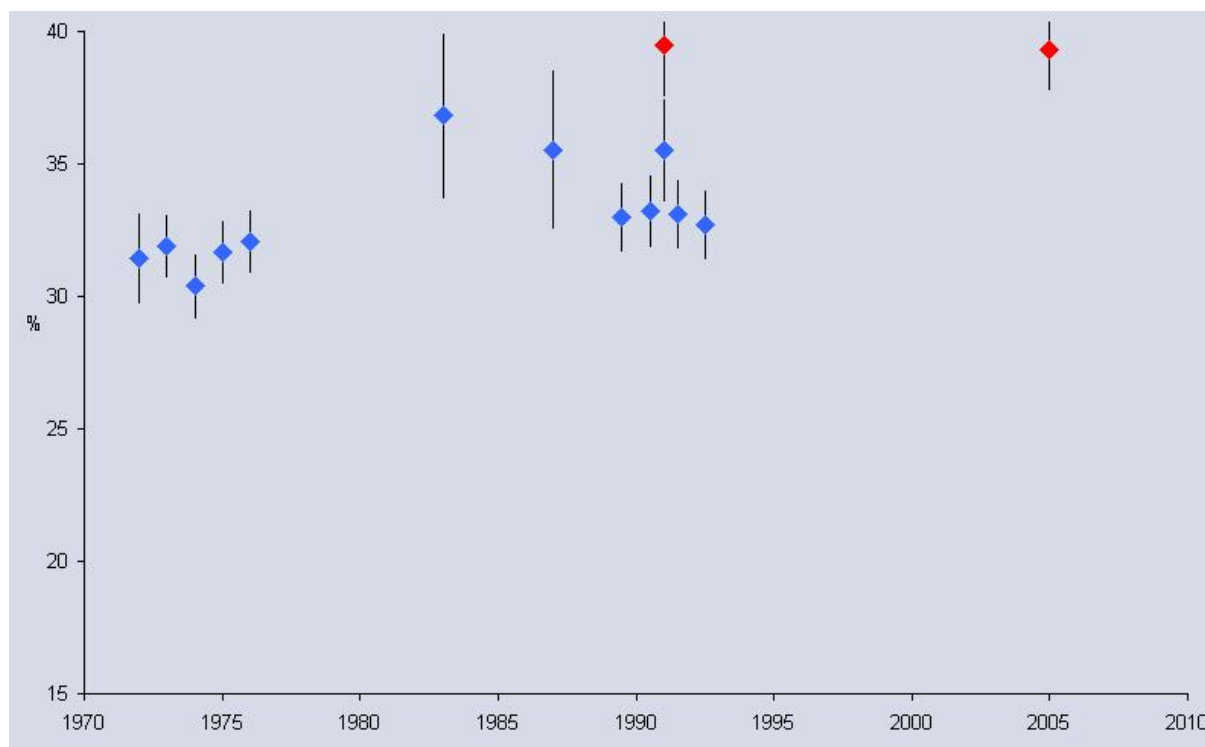
Historical changes in social mobility

Data that compare the occupation class of men and their fathers confirm that the level of social mobility of those entering the labour market after the war was higher than those entering the labour market before the war and that this continued until at least the end of the 1950s, indicating a growth in absolute mobility (Heath and Payne, 1999).

Recent economic analyses suggested that there was a decrease in income mobility between the 1958 and 1970 birth cohorts (Blanden, Gregg and Macmillan, 2010) although analyses by social class found no change in mobility (Goldthorpe and Jackson 2007). Further work (Blanden and Machin, 2007; Goldthorpe and Mills, 2008) has suggested that both income and social mobility of men has been broadly

constant from the 1970s cohorts onwards (Figure 25). It is likely that the debate on both resolving the different results and assessing whether income or social class is the most appropriate measure will continue.

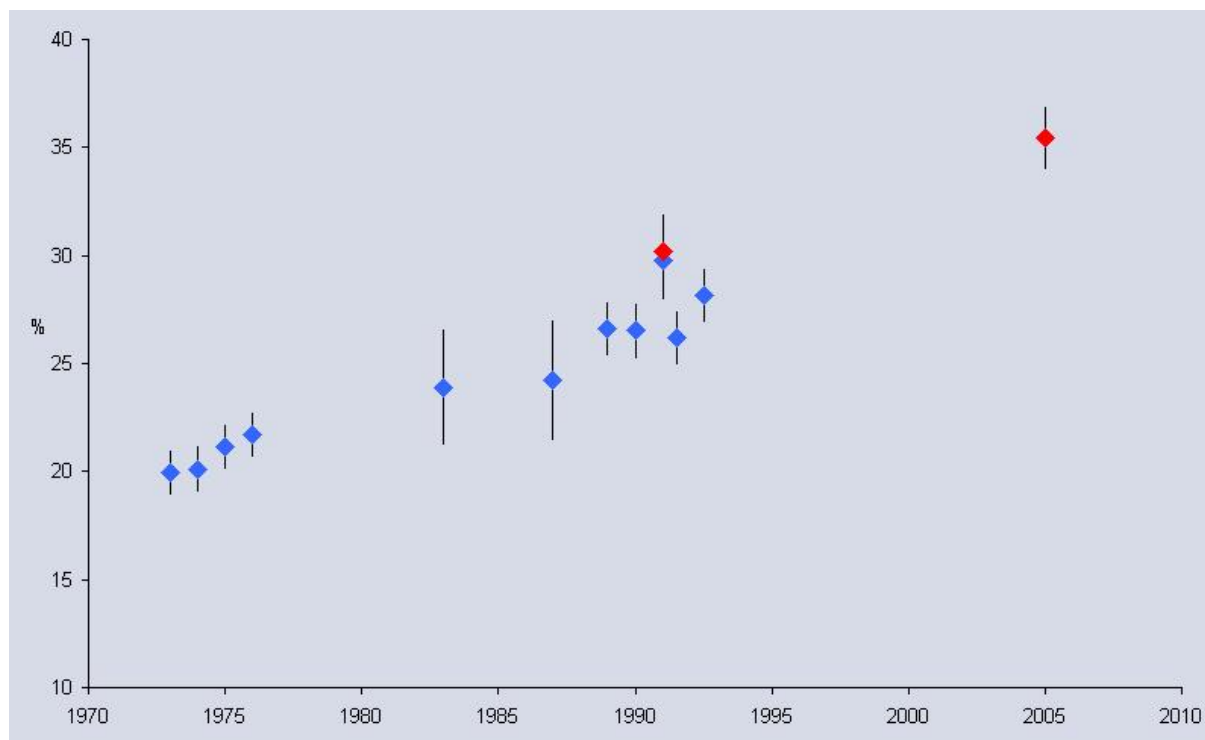
Figure 25: Percentage of men in higher social class than their father



Source: Goldthorpe and Mills (2008). Lines show confidence intervals; the blue dots represent different types of surveys from the red dots and are not comparable

Many income-based studies have tended to focus on male mobility because income is strongly affected by women's labour market participation. Many social class analyses specifically focus on gender to understand the impact of women's increased participation in the labour market and increasingly in higher occupations. Other studies have decided that the appropriate 'unit of analysis' might be the couple for married or otherwise partnered people, and therefore have classified single individuals by their own employment while couples are classified according to the individual with the 'dominant' labour market position within the couple.

Since 1930, cohorts of women have experienced steadily increasing chances of gaining a higher occupational class job than their father, compared to those born before 1930 who were more likely to move to a lower occupational class. More recent cross-sectional surveys suggest the number of women attaining a higher occupation than their parents has continued to steadily rise since 1970 (Figure 26), mirrored by a decline in those becoming downwardly mobile relative to their parents. However, upward mobility of women in 2005 remained lower than for men.

Figure 26: Percentage of women in higher social class than their father

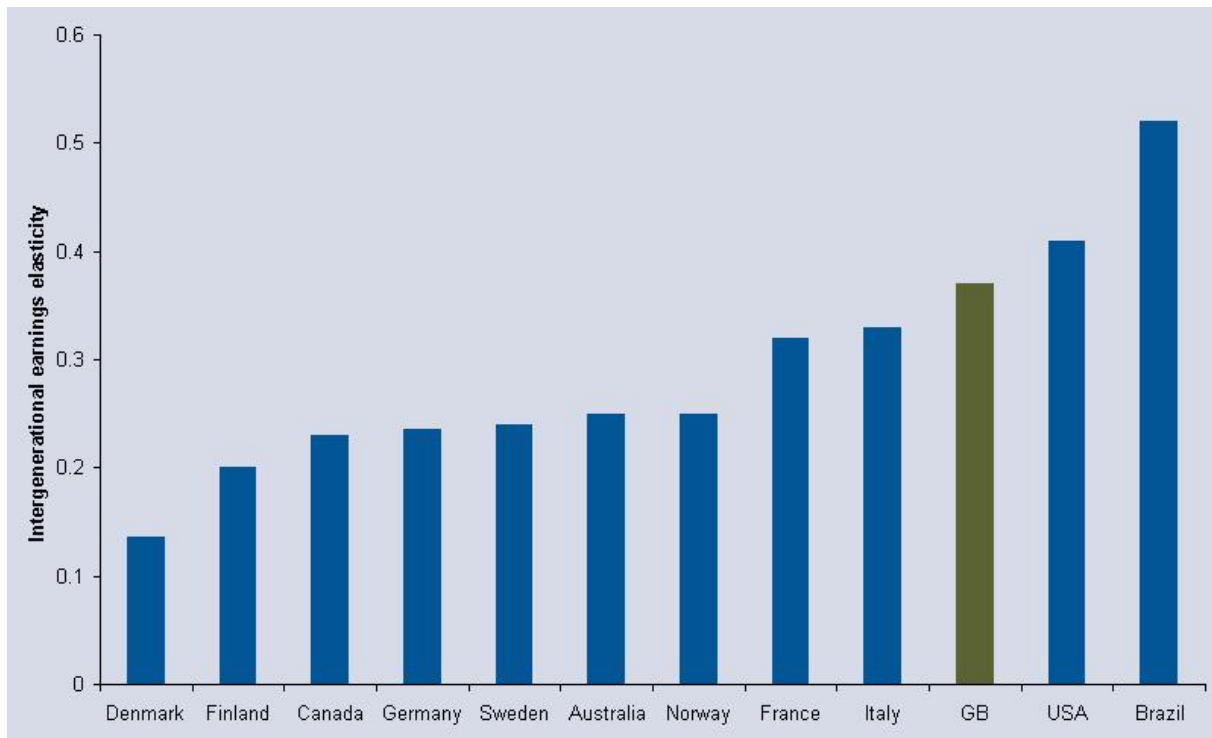
Source: Goldthorpe and Mills (2008). Lines show confidence intervals; blue and red dots represent different types of survey and are not comparable

International Comparisons

There is an extensive literature exploring measurement and differences in social mobility in different countries (Breen 2004, d'Addio, 2007, Blanden 2009). While there is a recognised schema for representing social class across different countries (Erikson and Goldthorpe, 1992), the difficulty of international comparisons, whether using income or social class measures, is widely acknowledged. However, Blanden (2009) considers a range of literature on income, social status and income mobility across generations and concludes that they point towards similar international rankings, with a few notable exceptions. In particular, the US is considered “immobile by income measures but rather more mobile in terms of social status and education whereas for Germany the reverse is true”. She concludes that the UK “tends to be towards the immobile end of the spectrum on all measures”.

Figure 27 and Figure 28 show the relative position of the UK compared to other countries using measures of income and occupation. The height of each bar in Figure 27 shows the strength of the relationship between sons' earnings and their fathers': higher bars indicate a stronger relationship, which is an indication of lower mobility.

Figure 27: Strength of link between individual and parental earnings across OECD countries

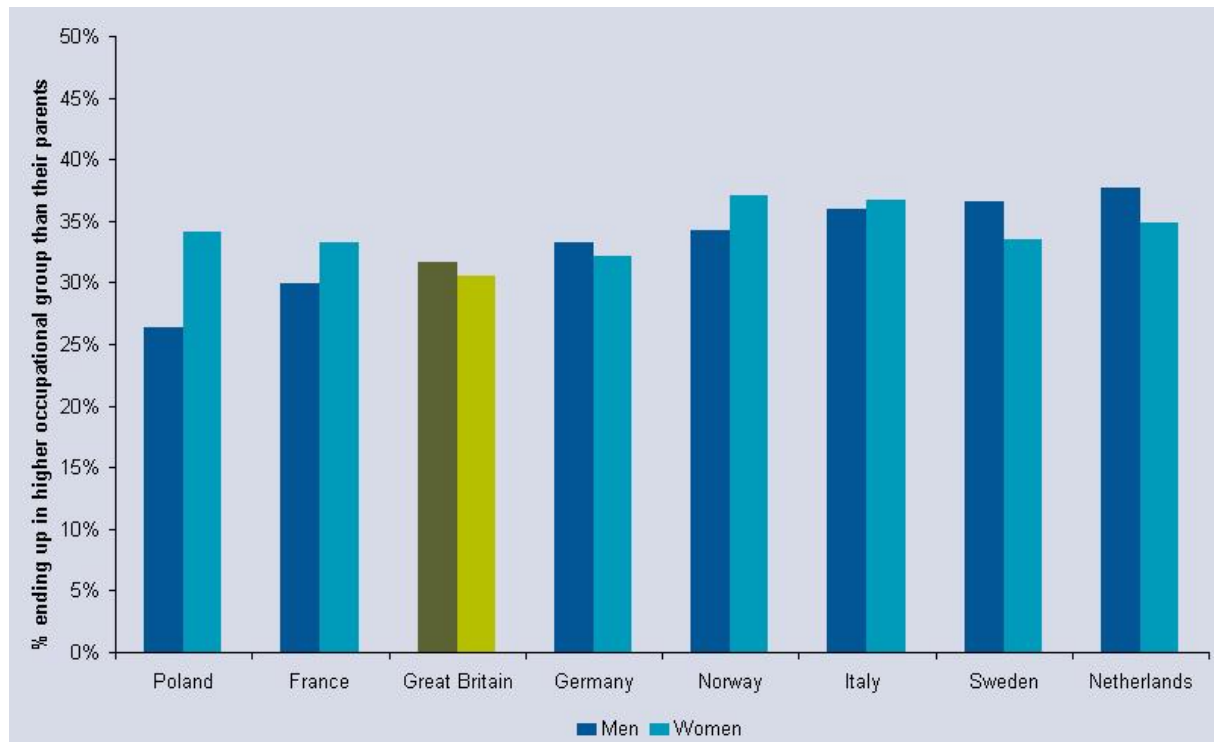


Source: Blanden (2009)

Figure 28 shows the proportion of men and women who end up in a 'better' job than their parents.⁸⁶ For men the figure for the UK is low by international standards and for women the figure is at the bottom of the range.

⁸⁶ It should be noted that the results are based on different data sources for each country, each of which use their own different occupational class schemas, making cross country comparisons uncertain.

Figure 28: Proportions of men and women in higher occupational groups than their parents



Source: National Equality Panel, *An Anatomy of Economic Inequality in the UK*, Government Equalities Office (2010)

Although a consensus does not exist on how the mechanisms work, there appears to be a relationship between (cross-sectional) income inequality and intergenerational earnings mobility, so that countries with low income inequality tend to have relatively high social/income mobility (Blanden, 2009). This is certainly the case in Scandinavian countries. However, other countries such as Australia do have levels of income inequality comparable to the UK, but seem to achieve high levels of social mobility. It is noted that income inequality in the UK rose strongly through the 1980s (Brewer et al. 2008), which may account for some of the differences in mobility findings as measured by income and social class.

Factors influencing mobility

Many of the studies noted above have focused on examining the overall level of mobility in a society, highlighting the importance of factors such as income inequality, educational spending and high returns to education, which appear to be highly correlated with the level of social mobility. This section examines social mobility from the individual's perspective, highlighting the importance of education at different stages and the apparent key role of higher education.

The Government's Strategy for Social Mobility (HMG, 2011) presents a life cycle approach to considering and addressing social mobility. Researchers and academics

working in the area of social mobility have identified a number of key factors relating to individuals which are seen as important influences on social mobility.

Early years influences – foundation years are a period of rapid development and gaps emerge early with children from poorer families generally scoring lower in various cognitive and developmental tests. Researchers have identified a range of factors such as parenting style, the quality of home environment, family structure and pre-school care (Sylva et al., 2004) which can set a pattern of development in later life that it is hard to reverse even through schooling.

Parental education – as discussed in the previous chapter, several studies have investigated the impact of the level of parental education and social class on social mobility (particularly as measured by income or attainment of a degree). While there is evidence of a decline in the advantage of having degree educated parents in terms of performing well at age 11 and 16 for the current generation compared to previous ones, a substantial advantage remains. For children born in 1989/90, the odds of obtaining at least 5 good GCSEs were still four times higher for children of degree parents than for those whose parents did not go to university – compared to 4.6 times higher for those born in 1970 and 6.5 times higher for those born in 1958 (Ermisch and Del Bono, 2010).

Education and qualifications – some studies have focused on the acquisition of educational qualifications. Although this may be interesting since educational qualifications confer a status, it is generally agreed that education translates into other or wider measures of social mobility through a range of mechanisms, most importantly cyclical and structural developments. Generally, an individual's level of education is found to be one of the most important influences on their mobility. However, there is evidence that the introduction and expansion of universal education systems, thereby increasing overall levels of education, does not lead to increasing levels of overall social mobility (Nunn et al., 2007). It appears that the mechanism through which education influences social mobility is by conferring an advantage to an individual based on the level of their qualifications relative to others. This means that equity in access to education and closing the attainment gap are important in increasing social mobility.

Cognitive and non-cognitive attributes – many analyses have included measures of cognitive and non-cognitive attributes. Some analysts see intelligence, as measured by IQ tests (or other tests of intelligence) as being the key factor in determining mobility (Saunders, 2010). Other studies have focused on factors such as 'application', 'self-regulation', 'empathy' and 'character' (Lexmond and Reeves, 2010).

Social and cultural capital – resources based on group membership, relationships, influence and support networks and the forms of knowledge, skills, education and advantages that a person has can increase their potential to 'move upwards'. There is some evidence which suggests that 'traditional working class' social capital has declined while other 'negative' forms have emerged such as worklessness, anti-social behaviour and drug abuse. A lack of positive role models, peer pressure,

poverty of ambition and risk aversion may also act as barriers to social mobility (Nunn et al., 2007).

(Early) labour market experiences – some analyses have highlighted the importance of early labour market experience in influencing individuals' subsequent life chances (Bukodi and Goldthorpe, 2009). In recent decades substantial levels of worklessness, long-term economic inactivity or a 'low-pay – no-pay' cycle have emerged in some areas and/or specific population groups (McKnight, 2000; Kemp et al., 2004; Carpenter, 2006).

Environmental and labour market factors – in addition to these individual-related drivers, researchers have identified a substantial number of 'environmental' factors which impact on overall levels of mobility including economic structures and enablers, poverty and inequality and a range of area-based influences. For instance, Crawford et al (2011) and others identify a number of key features of the UK labour market which have impacted on social mobility and have implications about the possible approaches to increasing it. For instance, the 'hollowing out' of intermediate skill jobs, which is evident in the UK may make it more difficult for people to move out of lower level jobs purely because there are fewer middle level jobs available. They also discuss aspects of employment law such as maternity/paternity leave, which at levels of up to 12 months appears to have a positive effect on children's outcomes and hence social mobility. Similarly, they conclude that minimum wage legislation has had a positive impact on social mobility by reducing wage inequality without adversely affecting employment or people's decisions about education.

There is a substantial literature on the influence of a range of spatial and locational factors, which are discussed only briefly since they fall beyond the scope of this paper. For instance, several researchers identify the wide socio-economic divergences between different locations including social mix, crime, types of housing, availability of employment, access to transport and access to the internet which have substantial long-term impacts on achievements of individuals (Nunn et al., 2007).

The Role of Higher Education

While there is an active debate about the importance and relative impact of different influences and interventions at different stages of the life cycle,⁸⁷ there is broad agreement that educational achievement at age 16 and in post-compulsory education are extremely important in determining the level of intergenerational mobility. However, it is clear that many of the factors are interrelated and the dominant role of education disguises an important role for cognitive and non-cognitive skills in generating intergenerational persistence.⁸⁸

⁸⁷ Much of this debate is helpfully summarised in Crawford et al. (2011) and Nunn et al. (2007),

⁸⁸ Intergenerational persistence is a term which measures the extent to which an attribute (eg income or social class) is passed from parent to child. Persistence of 1 or 100% means that children inherit exactly the status of their parent. One study (Blanden, Gregg and MacMillan, 2006) explored the role of education, ability, non-cognitive skills and labour market experience in generating intergenerational persistence in the UK. It found that these variables explained around half of the association between parental income and children's earnings for the 1970 cohort. Post-16 qualifications accounted for around 20% of persistence, with degrees accounting for about half of this. Cognitive and non-cognitive skills were found to work largely through influencing the level of

Several studies have considered why the expansion of universal education systems and in particular the huge expansion of HE participation have not led to increasing levels of social mobility. There is wide agreement that boys and girls from middle-class families have been better able to take advantage of increasing educational opportunities, partly because of higher levels of social and cultural capital but financial factors and risk aversion have also been highlighted (Breen and Goldthorpe, 1997; Callender and Jackson, 2005; Connor et al., 2001). This differential access to education tended to reinforce the position of different groups. Blanden et al. (2006) concluded:

The growing imbalance in access to higher education by family background as HE expanded has been noted in a number of other papers ... and here we provide powerful evidence that this imbalance is driving the decline in intergenerational mobility in the UK [between the 1958 and 1970 birth cohorts]

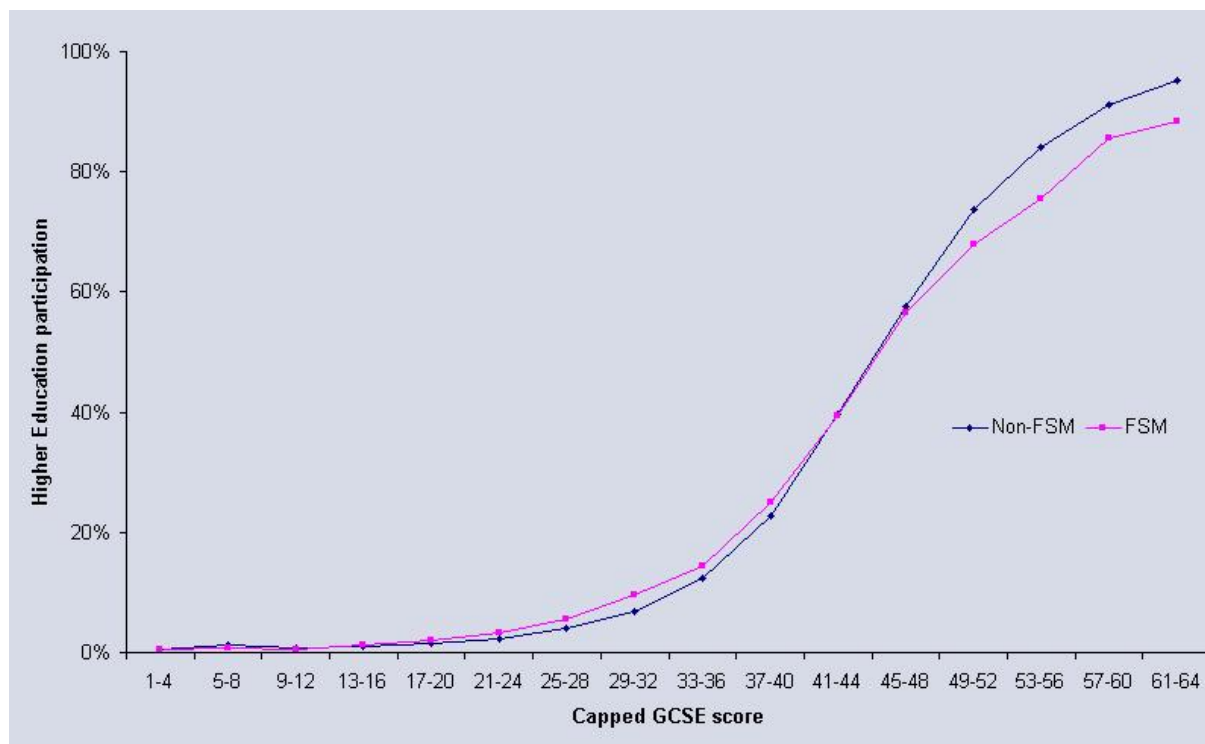
The previous chapters explored the financial and wider benefits that HE participation can confer, and noting the higher returns for people from more disadvantaged backgrounds and from more selective institutions. It is clear that HE participation is an important factor in increasing earning potential and expanding opportunity for individuals. It follows that increasing the numbers participating in HE is key to improving overall levels of social mobility in the UK, in order to ensure that everyone with the ability to succeed in HE is able to benefit from the advantages and increased opportunities that it brings.

Drivers of participation in HE

It is important to understand the mechanisms for increasing participation in HE across all social groups, and in particular to ensure that bright young people from more disadvantaged backgrounds attend the most selective courses and institutions where there appear to be the highest financial returns. Earlier literature tended to report that the likelihood of a young person attending HE is strongly related to that young person's background - in particular their parents' education level and/or socio-economic background (Blanden and Gregg, 2004; Carneiro and Heckman, 2002 and 2003; Gayle, Berridge and Davies, 2002; Meghir and Palme, 2005; Haveman and Wolfe, 1995).

More recent studies have found that the key determining factor of whether a young person goes into HE is their prior attainment (Broecke and Hamed, 2008; Chowdry et al, 2009). The differences in HE participation rates of young people from the most and least levels of disadvantage are largely explained by the differences in achievement at GCSE and A-level. Figure 29 shows that the participation rate for similarly achieving young people is very similar regardless of their FSM status. Similar results are found using other measures of disadvantage.

education attained, but were also found to have a residual influence even when educational attainment was included.

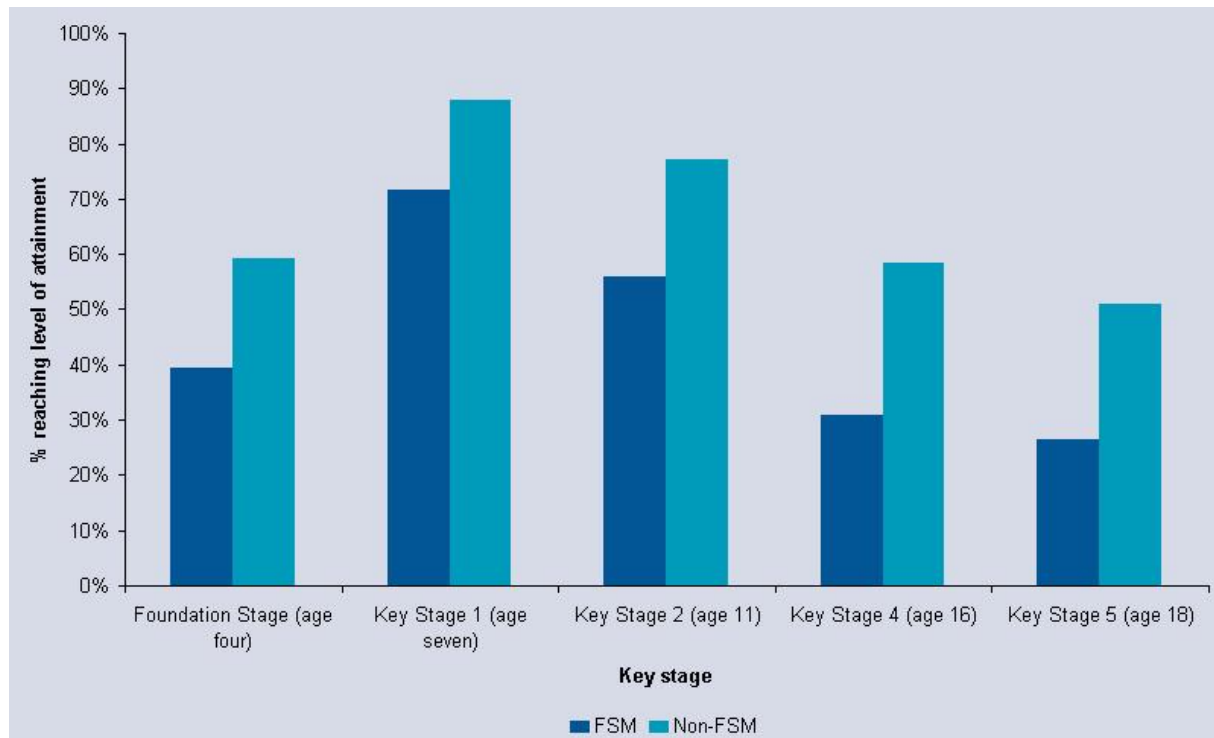
Figure 29: Participation in HE is strongly related to prior attainment

Source: National Equality Panel, *An Anatomy of Economic Inequality in the UK*, Government Equalities Office (2010)

As shown in Figure 30, there are strong links between academic performance/progress at all ages and social class and other forms of disadvantage, which seem to hold even once differences in prior attainment are allowed for (DCSF, 2009). This suggests that some of the socio-economic differences in HE participation are reflections of earlier inequalities in primary and secondary school performance.

However, while prior attainment appears to be the most important determinant of HE participation, even exhaustive studies such as Chowdry et al. (2009) find that there is a socio-economic gap in young HE participation even after allowing for attainment at GCSE and A level. Other studies identify large differences in HE participation by ethnicity even after accounting for prior attainment (Broecke & Hamed, 2008). There is good evidence that outreach and other activities do have an effect on participation of different groups (Morris et al., 2009). There is a substantial literature showing that tuition fees and the availability of grants and loans do have an impact on participation. While fees do reduce participation, evidence shows that the availability of grants and loans do counteract this, so that the most recent changes to student support were neutral in terms of participation (Dearden et al., 2010). Finally, it is clear that people who have failed to achieve good qualifications through a traditional school route can still get into and succeed in HE through alternative routes such as HE access courses (BIS, 2010).

Figure 30: Children from disadvantaged backgrounds tend to underperform their more advantaged peers throughout their school career



Source: DfE Statistical First Releases

As discussed in Chapter 2, there are significant differences in returns to HE study across different institutions, subjects and types of student. Crucially in terms of contribution to social mobility, it is clear that there are substantial differences in the participation rates of young people in the most selective institutions by school-type, socio-economic group and other forms of disadvantage (Sutton Trust/BIS, 2009; Chowdry et al., 2009). While the literature is much more limited, there is substantial data which shows that older and ‘non-traditional’ students with vocational qualifications tend to be concentrated in ‘post-92’ universities (Sinclair & Connor, 2008).

Therefore, while improving attainment of young people in schools is extremely important in increasing participation in HE, it would not address all aspects of participation in HE. In particular, it is important that routes remain open for those with the potential to succeed in HE, but whose attainment at school did not reflect their longer term potential, and that everyone is encouraged to consider participation in the subject and institution that will confer them the greatest advantage.

Postgraduate study

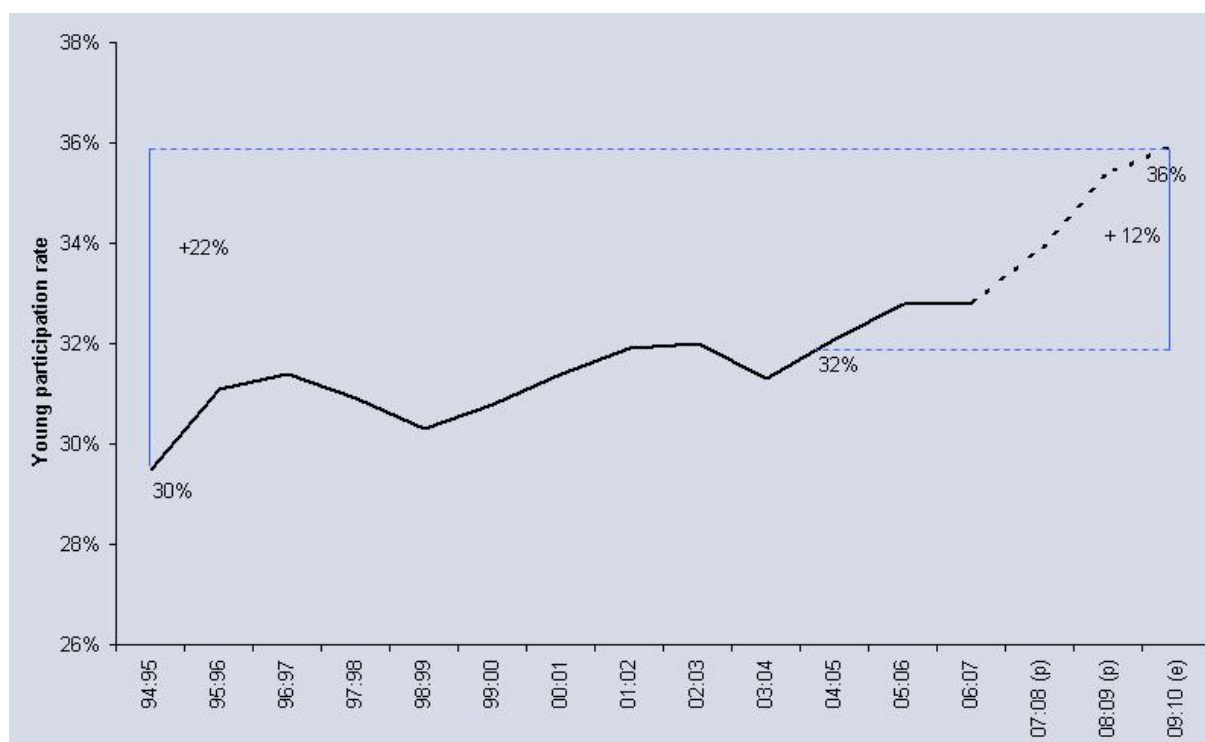
As noted in Chapter 2, there are benefits to postgraduate study which include lower unemployment rates, a heightened probability of working in higher occupations and higher earnings. Postgraduate study is a popular destination for undergraduates. For many professions a postgraduate qualification is a requirement, but more

generally postgraduates are primarily motivated by a desire to further their careers with subject interest being of secondary importance (Allen et al., 2006; Purcell et al., 2005). Most evidence appears to indicate that, once the decision has been made to study in HE, entry to postgraduate study is not influenced by social class, though there may be some issues for students who are first in their families to go into HE (Stuart et al., 2008). Generally, it appears that the disadvantage evident in students entering HE has been alleviated by the time they reach postgraduate level.

Progress to date on increasing and widening participation

Young (18–19 year old) participation⁸⁹ in HE has increased for England, rising from 30% cent in the mid-1990s to 36% at the end of the 2000s (Figure 31), making young people today over 20% more likely to go on to higher education than in the mid-1990s, with over half of this increase happening in the past 5 years.

Figure 31: Trends in young participation for England



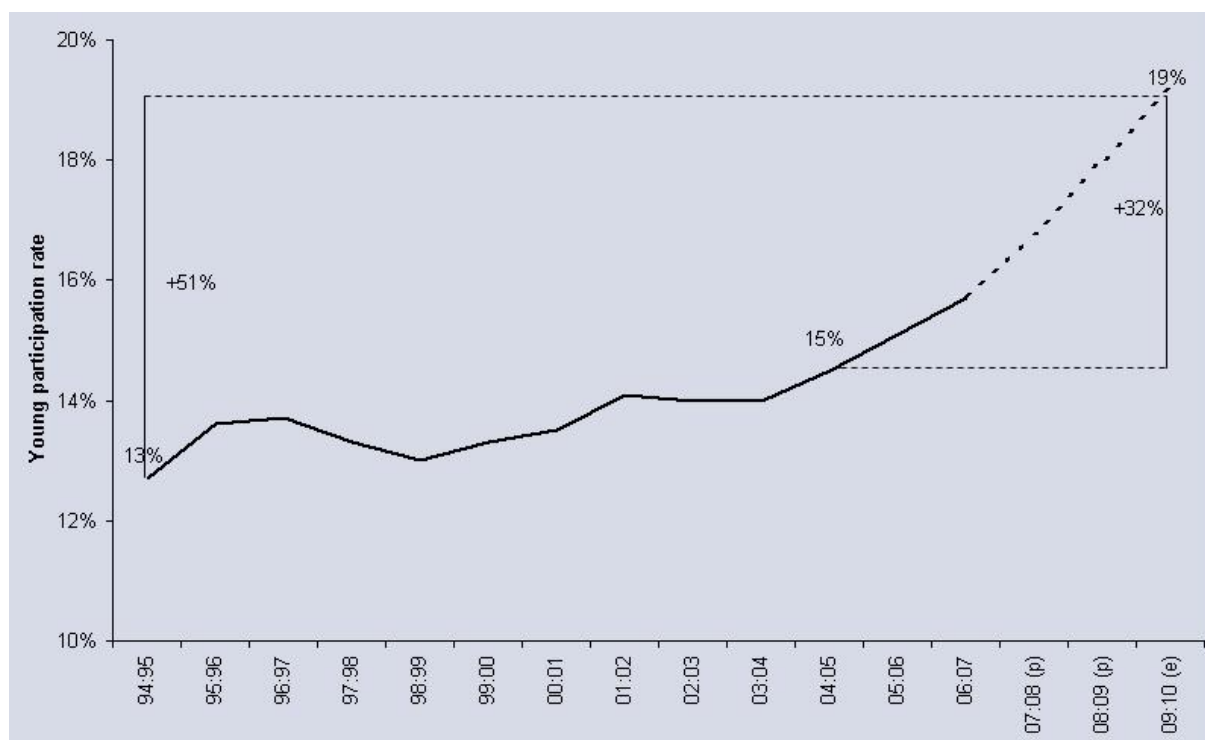
Source: HEFCE (2010)

Notes: The following charts (Figures 31, 32 and 34-36) show cohorts of young people rather than entry in a particular year, so that '94:95' refers to the cohort aged 18 in 1994 (with entrants to HE in academic years 1994-95 or, aged 19, 1995-96). Figures for 07:08 and 08:09 are provisional but are not expected to change materially. Figures for 09:10 involve some evidence-based projections, so are considered less certain.

⁸⁹ Young participation refers to people entering HE for the first time at ages 18 or 19. Note that the well-known HEIPR (HE Initial Participation Rate) refers to participation up to age 30.

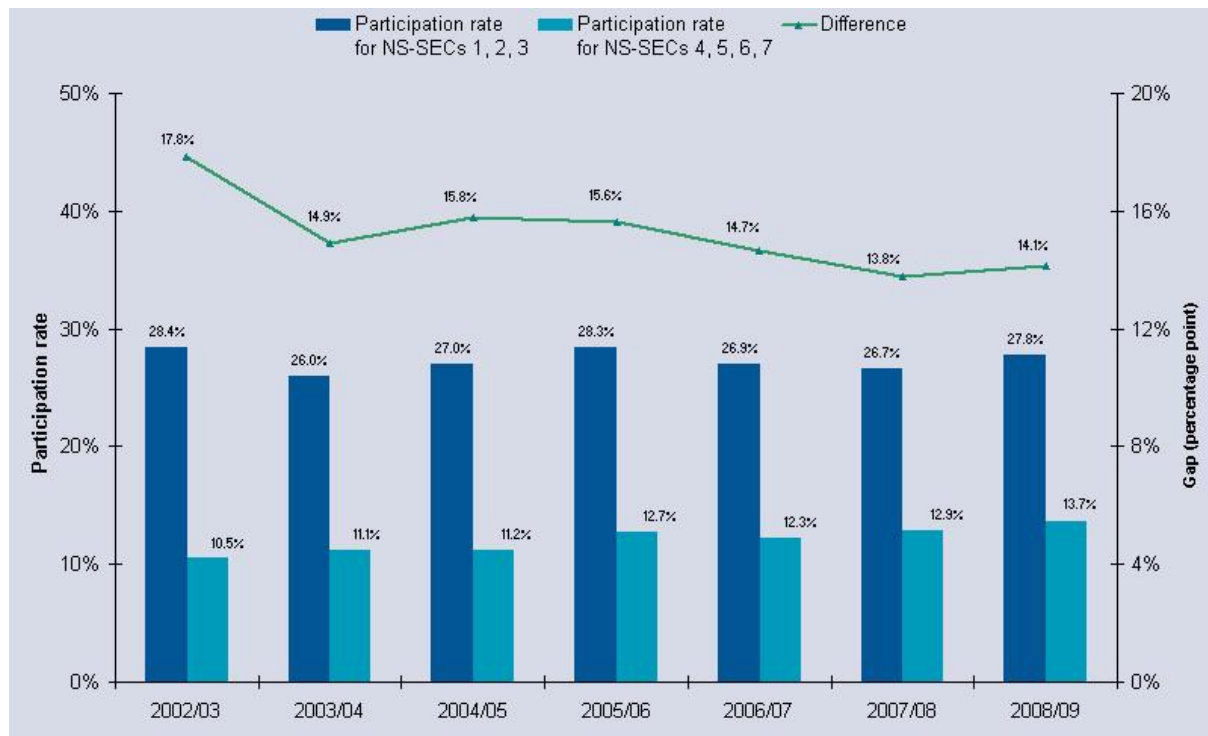
There are large differences in participation rates according to where young people live. Currently fewer than one-in-five young people from the most disadvantaged areas enter HE compared to more than one-in-two for the most advantaged areas. However, young people from disadvantaged areas are substantially more likely to have entered higher education since the mid-2000s. The proportion of young people living in the most disadvantaged areas who enter HE has increased by around 30% over the past five years, and by 50% over the past 15 years (Figure 32). Further, the increases in the young participation rate for those living in the most disadvantaged areas have been greater in proportional terms and, since the mid-2000s, percentage point terms, than the rises for those living in advantaged areas. Therefore the differences in participation rates between advantaged and disadvantaged neighbourhoods have reduced since the mid-2000s.

Figure 32: Trends in young participation for the most disadvantaged areas determined by HE participation rates



Source: HEFCE (2010)

This progress is also reflected using data on participation of students classified by socio-economic group. Figure 33 presents information on the participation rates of 18 year olds from both higher and lower socio-economic classes and the gap between them.

Figure 33: HE participation rates of 18 year olds by social class

Source: BIS Internal Analysis HESA data, 2010

As noted, prior attainment does appear to be the key factor in determining participation in HE and the changes above are reflected in the improvements in GCSE attainment of young people in different groups. Other than improving the attainment of more disadvantaged pupils, there have been a number of other approaches aimed at widening participation in HE.

The overall expansion of numbers in HE has allowed and underpinned the widening of participation, whereby young people from more disadvantaged backgrounds have been able to enter HE without displacing those from more advantaged backgrounds. There have also been a number of specific initiatives to support widening participation. However, there is a lack of robust evidence on the impact of these various initiatives, which have included:

- Widening Participation Allocation through the HEFCE funding mechanism, where HEIs are allocated additional funding based on a formula weighting the number of students recruited from different areas and background;
- Access to Learning Fund enabling HEIs to provide additional financial support to students facing financial hardship beyond the standard student support package;
- OFFA-approved 'access agreements' which sets out how HEIs intend to use income bursaries, other financial support and outreach work for under-represented groups; and,

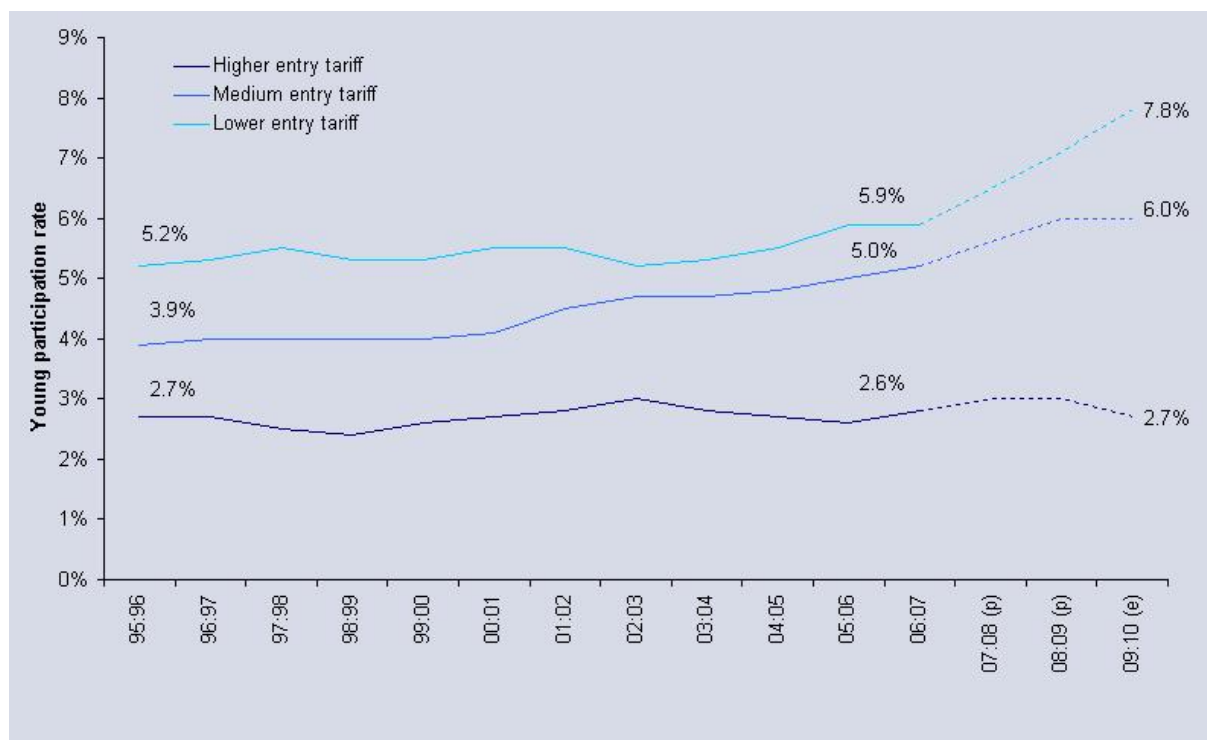
- Programmes which provide a range of activities aimed at increasing the awareness of HE and aspirations to participate amongst young people from disadvantaged communities.

There is some evaluation evidence around the impact of Aimhigher which indicated that it had increased the participation rate of young people with average attainment in Excellence Challenge schools with by 1ppt (Morris et al. 2009). Earlier studies indicated that Aimhigher activities helped to increase attainment and aspiration of potential applicants (Morris et al 2009, Emmerson et al. 2006). However, since Aimhigher comprised a range of activities which are determined and delivered locally, it is not possible to assess robustly which elements are most effective or how they operate. A number of studies (Sutton Trust/Boston Consulting Group, 2010, Davies et al., 2009, HEFCE, 2009) have explored the impact of activities such as summer schools or highlighted the differences in information, advice and guidance or general support available to different types of young people. While these studies tend to confirm that young people from more disadvantaged backgrounds do not receive the same levels of support as their more advantaged peers, there is little robust evidence of the quantitative impact of different measures or initiatives.

Progress on improving Fair Access

While progress on widening participation in HE as a whole is encouraging, recent analysis by OFFA (2010) has confirmed that the success in widening participation to the sector as a whole has not been replicated in the most selective institutions. While there have been substantial increases in participation among the least advantaged 40 per cent of young people across higher education overall compared to the mid-1990s, the participation rate among the same group of young people at the top third of selective universities has remained almost flat over the same period (Figure 34).

Figure 34: Participation rates of the bottom 40% (by parental education) of young people



Source: OFFA (2010)

Furthermore, increases in the participation rate of the most advantaged over the same period (Figure 35) have led to relative differences in participation at these institutions increasing: the most advantaged 20 per cent of the young population were around six times more likely to attend HE in the mid-1990s but this increased to around seven times more likely by the mid-2000s (Figure 36). It is interesting to note that since the mid-2000s, a period concurrent with the operation of the current student tuition contribution and support arrangements, this ratio has not increased further. However, it might be noted that the ratios have continued to improve at medium and lower tariff institutions.

Figure 35: Participation rates of the top 20% (by parental education) of young people

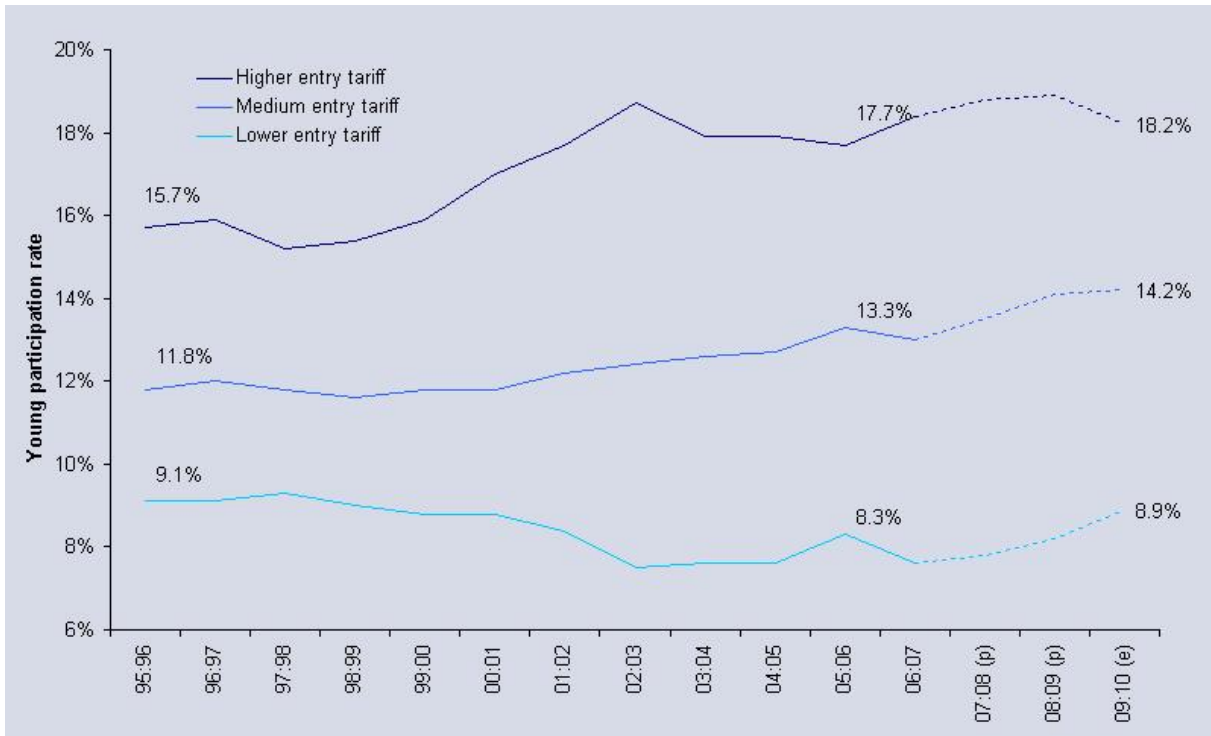
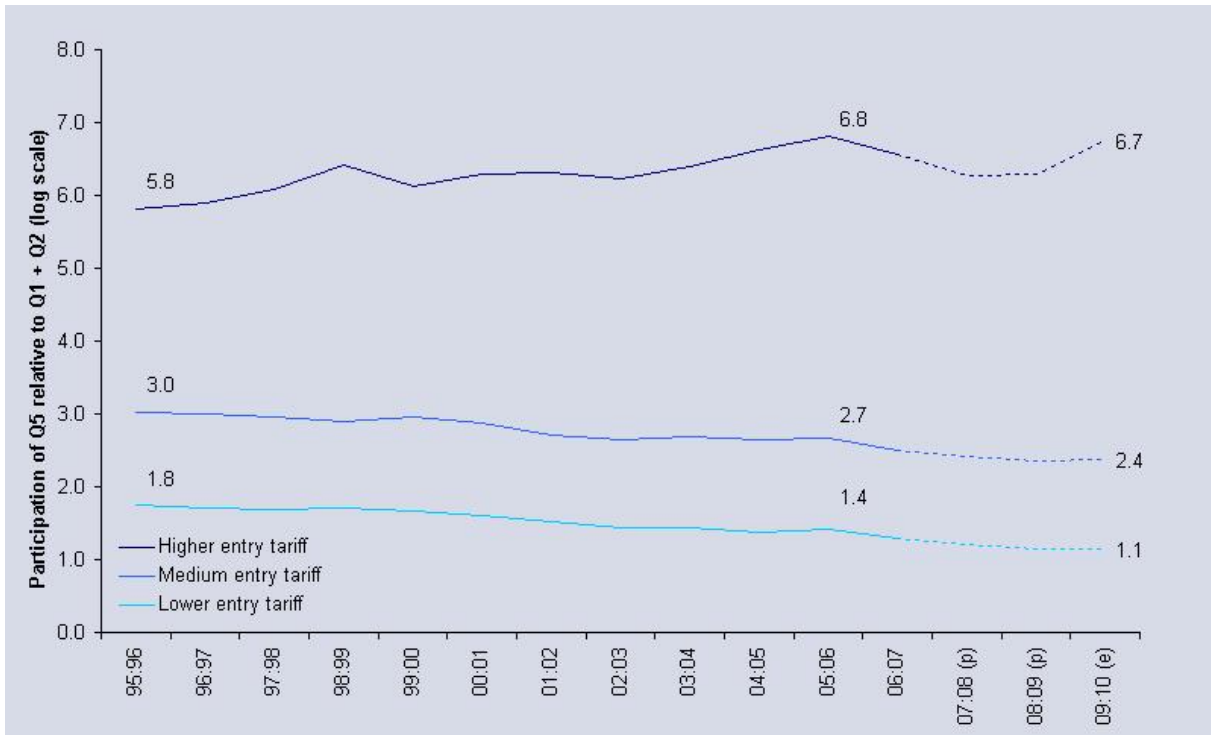


Figure 36: Relative participation rates of the top 20% and bottom 40% (by parental education)



Source: OFFA (2010)

Influences on Fair Access

Prior attainment – recent research by the Sutton Trust and BIS (2009) confirmed that the single most important factor determining the probability that students obtained a place on one of the most academically demanding degree courses was the student's own A level (or equivalent) results.

Applications behaviour – beyond this, the differences, by type of school or college, in participation rates on the most academically demanding courses can be largely explained by differences in the number and patterns of applications from different types of school or college: pupils from independent schools in the top fifth of schools according to average A level attainment, on average made twice as many applications to 'Sutton 13'⁹⁰ universities than their peers from comprehensive schools with similar overall levels of attainment. (Sutton Trust/BIS, 2009)

Financial support – it appears that finance plays a secondary role in young people's decision to attend HE, though can influence their decisions on where to attend. Recent research (BIS, 2010) suggests that, to date, financial factors appear to exert a geographical influence through whether people can continue to live at home. The same research indicates that there may be a lack of understanding or knowledge of bursaries and student finance in general. The OFFA research, discussed above, concluded that bursaries offered by universities had not had any influence on young people's choices between universities.

Knowledge and understanding of HE – several studies have highlighted the differences in the information, advice and guidance and general support available to different types of young people. This may contribute to the lower awareness of young people from state schools about the differences between HE institutions and their outcomes (Davies et al., 2008).

BIS and Sutton trust are currently undertaking work to understand the decision making of high achieving young people, but it is likely that improving the attainment of disadvantaged pupils will not be enough to make progress in fair access. Other initiatives will be required, involving improving the information, advice and guidance available to all groups and raising the aspirations of very bright young people to attend the most selective courses and institutions.

Conclusion

The UK is noted as having relatively low levels of social mobility compared to other OECD countries. It also appears that social mobility in the UK has been relatively flat

⁹⁰ Sutton 13 is the group of 'research intensive' universities used by the Trust in analyses aimed at understanding Fair Access issues; it comprises Bristol, Cambridge, Oxford, Durham, Edinburgh, Imperial, UCL, LSE, Nottingham, St Andrews, Warwick, York and Birmingham.

for some generations born since the 60s, though there may be some small improvements in leading indicators such as educational performance.

Education is recognised to be an important influence on social mobility and higher education appears to be a particularly important factor. Therefore, increasing participation in HE, particularly in those areas which confer the greatest returns, is likely to have a significant impact on social mobility. There is evidence that middle class and higher income families benefited most from the rapid expansion of higher education, which may have had the effect of reinforcing the status quo in terms of income and social class.

Over the past 15 years, and particularly over the last five, there have been substantial increases in the HE participation rates of young people from disadvantaged backgrounds, which should have a positive impact on increasing social mobility. However, the success in widening participation to the sector as a whole has not been replicated in the most selective institutions which tend to confer the greatest benefits. It appears that this is mainly due to the applications behaviour of young people, which in turn may be due to lack of good information, advice and guidance for all groups of potential applicants.

5. The Role for Government in Higher Education

Summary

Government intervention in Higher Education is justified by the presence of a number of market failures. These include imperfect information leading to failures in credit markets, equity concerns and the presence of positive externalities. Whilst some of these factors are shared by other sectors, such as health care and primary education, in other respects the HE sector differs significantly.

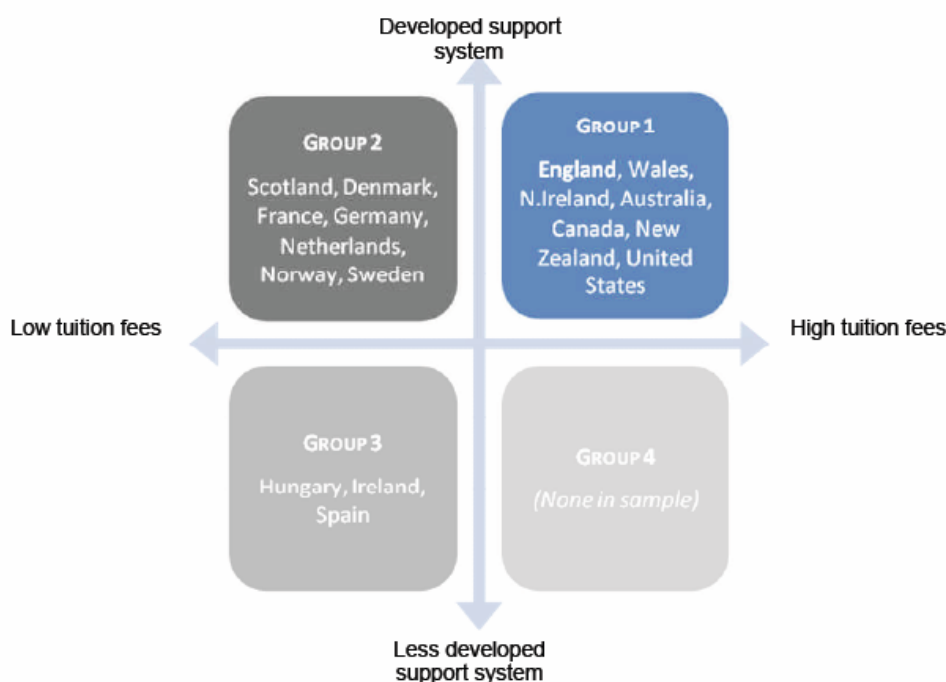
The evidence does not point towards one solution in HE. There are a range of approaches taken internationally, and government intervention requires complex targeted measures.

This chapter sets out the economic rationale for government intervention in HE and describes how interventions and individuals' contributions have evolved over time. Evidence is also presented which suggests lessons can be learnt from past policy interventions and adapted to meet the future challenges of delivering high quality higher education in England.

Introduction

Across the world, the role taken by governments within Higher Education systems varies widely. It can vary in terms of the level and nature of tuition fees, student support, and public subsidies for teaching. A review of sixteen other countries carried out by London Economics (BIS, 2010d) demonstrated the nature of these differences. Figure 37 shows a simple classification of systems based on tuition fees and student support systems. The English financing system is categorised as having relatively high tuition fees combined with a well developed and heavily subsidised student support system.

Figure 37: Characteristic-based groupings of international Higher Education systems



Source: London Economics in BIS (2010d). OECD (2010a) provides a fuller classification of countries where Japan and South Korea are given as examples of Group 4.

To further illustrate differences between countries, Table 5 provides comparative examples of three distinct HE funding systems in Australia, the United States and Denmark. These three countries provide useful comparators as, broadly speaking, the United States represents one of the most market-driven systems in the world, Australia shares many of the features of the UK system, and the Danish system is much more heavily public-based.

Table 5: Comparison of international HE funding and student finance systems

	United States	Australia	Denmark
Providers	Public and private mix.	Predominantly public but some private.	Public institutions only.
Graduate contributions	No limits – institutions are free to set their own fees. Average contributions by type of college range from £1,500	Maximum limit which varies by subject ranging from £2,300 to £5,000. Lowest cap for National Priority subjects (science,	No fees for full-time students. Small contributions for part-time students.

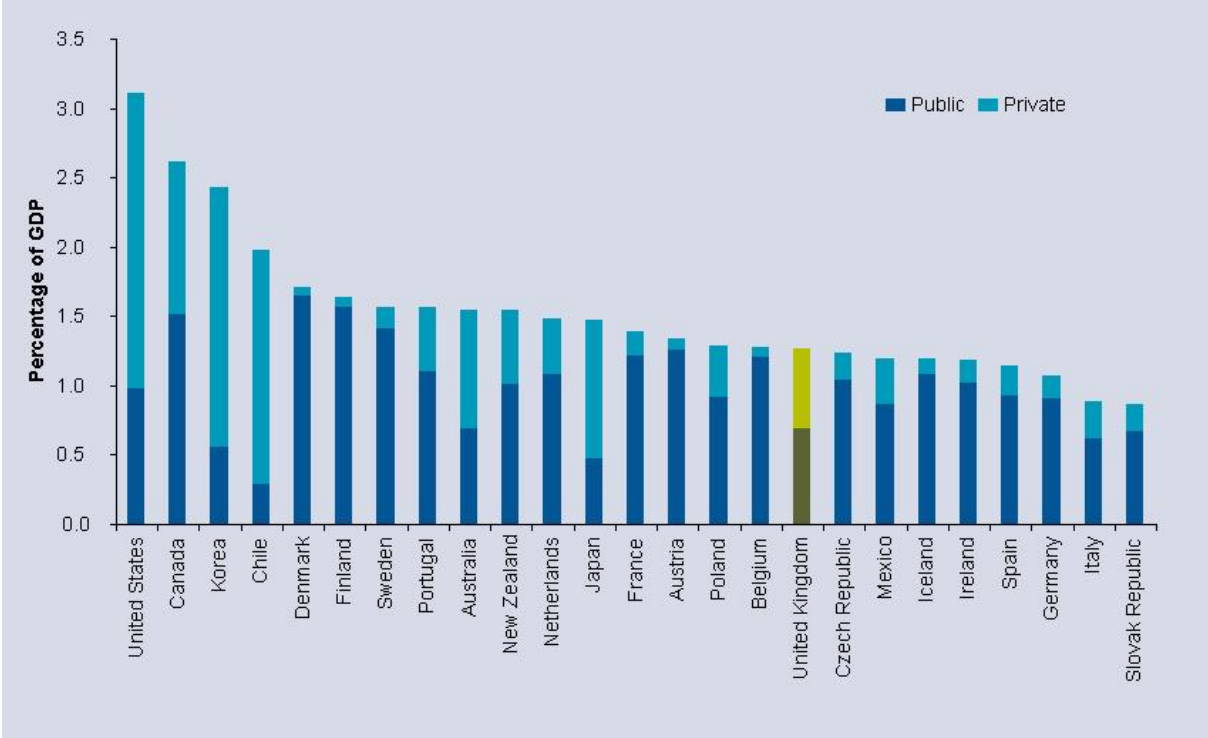
	United States	Australia	Denmark
	to £20,000. Large variation.	maths, nursing etc.).	
Student support	Federal Pell ⁹¹ grants of up to £3,500, dependent on family income. Mixed loan system with real rate of interest and mortgage-style repayments.	Income contingent loans repaid from income above £23,000. Incur low rate of interest with a discount for paying contribution up-front.	Government issues grants of around £7,500 per annum. Mortgage-style subsidised loans of £3,500 are also available.
Teaching Grant	No national system – States arrange teaching funding allocations in public HEIs, often with performance contract.	Federal support provided via block grant to HEI to provide specific number of supported places. Value varies by subject.	Highly performance based. A formula is used for allocation which includes a range of student outcome measures including course satisfaction.
Private providers	Private students are eligible for Pell grants. No government teaching funding and limited oversight.	No government contribution. No tuition fee limit. Students at eligible private institutions can apply for government support.	N/A
Further student support	Other Federal grants for poorer students. States and private institutions often have their own support schemes.	Two main student scholarship funds which allocate means-tested grants. Means-tested income support available under the Youth Allowance.	Additional loans for certain groups.

Source: Taken from BIS (2010d). Currencies were converted to pounds using Bank of England spot exchange rates in November 2009

⁹¹ The Federal Pell Grant Program provides need-based grants to low-income undergraduate and certain postgraduate students to promote access to higher education.

These international differences result in varying levels of public and private investment in HE. As a percentage of GDP, public expenditure on higher education in the UK was 0.7% in 2007 compared to 0.6% from private expenditure (Figure 38).

Figure 38: Public and private expenditure on tertiary education as a percentage of GDP, 2007



Source: OECD (2010a)

Notes: Private spending includes tuition fees and other student or household payments to educational institutions, minus support provided through public subsidies (including subsidies for tuition fees) which are included in public expenditure. It is important to note that whilst this OECD indicator covers all educational expenditure on institutions delivering or supporting educational core services, ancillary services (such as housing and transport) and research and development, it excludes expenditure outside institutions such as living costs and foregone earnings. It also excludes, therefore, public subsidies for educational expenditure such as maintenance grants and loans for students’ living costs, even though some of this may be recycled into HEIs through halls of residence and other spending.⁹²

Public and private expenditure combined increased from 1.0% in 2000 to 1.3% in 2007. However, this remains below the OECD average of 1.5% and significantly behind the expenditures of leading countries like the US (3.1%), Canada (2.6%) and Korea (2.4%).

⁹² A more comprehensive measure of public investment would include these expenditures (see for example OECD (2010a) EAG, Chart B5.2). However, this alternative data does not reflect the net cost of student loans (i.e. after repayments), only the gross outlay. It does not therefore accurately reflect the true cost to government of public investment or the differences in countries’ student support repayment terms (and thus the true level of subsidy graduates receive).

The balance of contributions between private and public investment in HE has been changing over time. Between 2000 and 2007, the OECD (2010) report that most member countries experienced an increase in private expenditure on HE as a proportion of the total. The UK experienced one of the largest increases during this period but a number of other countries also introduced or increased student contributions.

For the UK, most of the increase in private expenditure was attributed to the significant increase in household expenditure on tuition fees compared to the previous year, due to the 2006/07 academic year reforms (when the cap on annual tuition fees for domestic students was raised from £1,100 to £3,000). Over time, this was almost exactly offset by the reduction in direct public expenditure.⁹³

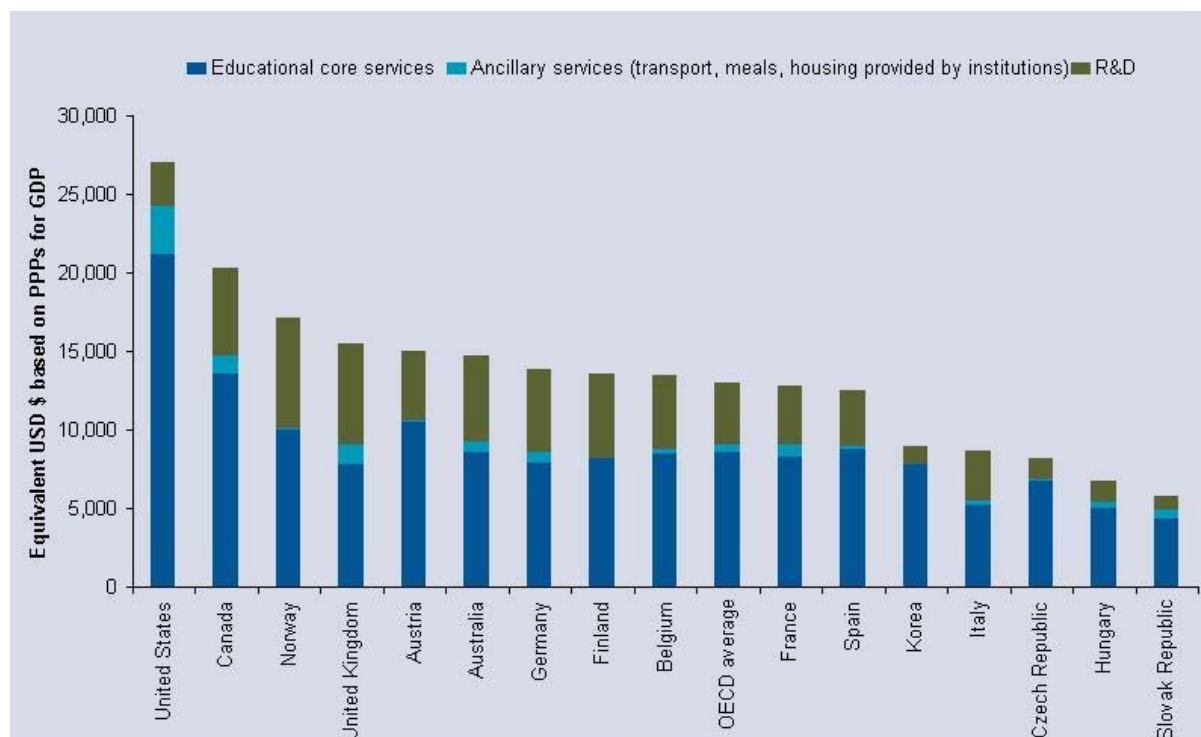
The size of the HE sector is an important factor in determining the level of a country's investment. For example, the total amount spent on tertiary education could reflect the number of students in each country or, alternatively, differences in the mix between teaching and research activities. Figures for expenditure per student, broken down into different types of expenditure, are presented in Figure 39 for the countries for which OECD data was available. This shows that in the UK, expenditure per student across all tertiary education activities was nearly \$15,500 in 2007, well above the OECD average of under \$13,000. A larger than average fraction of this was composed of research and development so core service expenditure (i.e. that related to teaching) was actually lower than the OECD average.

However, it is important to note that annual data of this nature does not necessarily reflect the differences between countries in HE provision; for example, the length of courses (or efficiency of provision) and quality of educational outcomes vary. Such factors are difficult to accurately adjust for. OECD analysis that uses simplifying assumptions to adjust for average duration of tertiary studies affects the rankings of expenditure.⁹⁴ The OECD data referenced above is also backward looking and this does not take into account proposed or actual changes since 2007.

⁹³ Other sources of the increase came from the income HEIs received from health authorities (intended to cover the cost of teaching for medical students), a small increase in R&D funding from the business and private not-for-profit sectors and an increase in funding from employers towards the cost of HE programmes provided in the FE (College) sector.

⁹⁴ See OECD (2010a) EAG Chart B1.5 p196.

Figure 39: International comparisons of annual expenditure by tertiary educational institutions on a per student basis (2007)



Source: OECD (2010a). Educational core services includes all expenditure that is directly related to instruction and education.

Why countries invest in Higher Education

Given the private benefits of Higher Education described in Chapter 2, it is possible to envisage a private market-based system where all courses are paid for by the student. However, a fully functioning market may produce the efficient outcome and level of investment only if there are no market failures. There are two primary forms of market failure in Higher Education which may lead to an inefficient outcome; imperfect information and presence of positive externalities. In addition, there are also equity considerations, which may prompt government to intervene.

Imperfect Information

Economic theory suggests for economic agents to make rational decisions there needs to be sufficient market information. In Higher Education, there is evidence of various sources of imperfect information relating to:

- The future (benefits from HE of higher lifetime earnings);
- Credit markets (accessing finance to pay for university);
- Prices (the cost of undertaking HE); and,

- The product (courses, universities).

Uncertain future returns

Individuals deciding whether to undertake HE face an uncertain return. While information is available on the average lifetime benefits of attaining HE level qualifications, each individual does not know the benefits that they will personally receive in the future.

It is inherently difficult for students to weigh up the costs and benefits from HE because costs are incurred during the period of study whereas benefits are accrued in the future through improved employment prospects and increased lifetime earnings. The same is true of the non-market effects of HE described in Chapter 3. For example, evidence from Canada (Usher, 2005) suggests that individuals tend to overestimate the costs of a degree and underestimate the amount of support available and the future benefits. Whilst the income returns are high enough to justify the investment on average, there is risk and uncertainty involved for an individual deciding whether or not to invest in higher education. Given evidence of risk aversion (see for example, Callender, 2003), potential students would be reluctant to invest, earn or borrow the money needed to cover tuition and maintenance costs.

Uncertainty about the future is potentially exacerbated by short-term horizons of potential students, who may not fully consider the effects of their current choices years into the future. This finding from behavioural economics would suggest decisions about investment in human capital may not fully take into account all information, even if it is available.

The net result of these market failures is that investment in HE would be lower than the level under an efficient market.

Credit markets

Imperfect information about the future benefits from Higher Education also generates problems in terms of access to finance. Under a free market, access to finance is necessary to enter HE, as many potential students cannot afford to pay the costs of HE up-front (because the benefits are not accrued until some point in future). In student finance, information barriers can cause private credit markets to fail because:

- The borrower cannot secure collateral to secure debt (because the benefits from undertaking HE of increased productivity and human capital are only known in the future), and even if they can;
- There is an asymmetric information problem as the potential borrower has more information than the lender (such as ability, or other innate characteristics, of the graduate and hence their future earning potential), which leads to potential lenders being exposed to:
 - Adverse selection (or hidden information, where the lender cannot observe characteristics of potential borrowers leading to a situation

where individuals who are least likely to repay loans are more likely to take them up); and,

- Moral hazard (or hidden action, where the lender cannot view actions by students or graduates that influence their future earnings potential, leading to an incentive for the borrower to act differently from the way they might do if self-financing).

These problems raise the risk associated with student loans and lead to the potential for high default rates. This can mean private banks are reluctant to offer student loans (EURYDICE, 1999). Shen and Ziderman (2007) showed through a large study of international student loan schemes that the percentage of total loan outlay that the lending institution can expect to receive back in repayments is considerably lower than 40 percent.

In response to this high default risk and the inability to distinguish between different types of borrower, private credit markets raise the interest rate at which they are willing to lend to potential students. This further discourages high ability students from applying for loans to undertake HE, as the high ability (and thus high future earning) students would be cross-subsidising the low ability students. As a result, this leads Canton and Blom (2004) to conclude that “adverse selection would further drive up the risk premium, possibly turning the credit system unsustainable over time.”

The increased risk premium associated with student loans in a private credit market reduces the attractiveness of the loan for potential students and may result in credit rationing to ‘cherry-pick’ the least risky students. Del-Rey and Verheyden (2008) for example, find that credit rationing in the student loan market can result from a combination of ex-post moral hazard and adverse selection.

The result of this private credit market failure is the provision of an insufficient level of finance necessary to generate the socially optimum level of investment in HE.

Products and prices

HE courses, and the benefits graduates from those courses enjoy, vary considerably, limiting the amount of tailored information it is possible to provide. Information affects potential students’ decisions about whether to undertake or invest in HE, which course to undertake and where to study. As a result, the lack of detailed information on courses could lead to inefficient decisions and a sub-optimal level or pattern of investment in HE.

Individuals therefore rely on other information such as tariff points, university prospectuses, age and prestige of institutions, student surveys or independently-provided university league tables and websites to assess quality and make decisions. In the UK, there are vast sources of such information available to prospective students about courses and the career options available for graduates. Yet whilst there are many examples of good practice in the provision of information, advice and guidance (IAG) about HE by schools, colleges and Connexions, there remain

concerns about the overall quality and focus of information provision. The Panel on Fair Access to the Professions (2009) noted the current variability in the quality of IAG provision and recommended improvements at the school level.

The 2006 Futuretrack survey of students entering HE identified a majority who felt that there was not enough information available (or none at all) to inform their decision making. Over a quarter of applicants agreed that they “needed more help in choosing which course to study”. Purcell et al. (2008) found that there is little evidence that potential students who faced barriers did not, as a result, apply for HE. However, the study found evidence that even among those who do apply to HE, around a third believe they had inadequate information on the courses available and around half had inadequate information on the relationship between courses and employment options. The extent to which these information issues exist throughout the education system are also important because earlier decisions about what subjects to study (for example at GCSE) influence the choices available at the point of applying to HE.

There is also evidence that leading university league tables, a key information source for potential students, are based on limited measures of quality, are often not comparable and therefore may not serve as informative and accurate sources for prospective students (HEFCE, 2008). Some league tables are also heavily influenced by research performance which may not necessarily reflect a similar teaching performance. In light of this, Purcell et al. (2009) propose the “public and professional need for a more precise taxonomy of universities”.

Parents can also present information barriers for potential students. There is clear evidence that many parents do not feel that they have the knowledge, experience or information to advise their children. And having parents who have been in HE themselves is highlighted as a major influence on whether a young person will consider HE, so the problems affect some people more than others (The Panel on Fair Access to the Professions, 2009).

These information barriers do not only have consequences for decisions made about whether to go to HE and which course to do. Before they enter HE, the subject choices that students make about their post-16 studies also have an impact on the options available in their applications to HE. There are also future impacts, as these decisions also affect future employment options (and thus future benefits from undertaking HE). The presence of these information barriers provides a rationale for government to intervene to ensure there is an adequate amount of, and access to, information for all potential students.

Of course, not all students face these information barriers to the same degree. Part-time students for example, are more certain about what they want to do and can apply previous work experience and labour market knowledge to their decisions to undertake HE. Callender and Wilkinson (2010) found that the vast majority of part-time students did not believe they needed more help or advice in choosing their course of study with only one-third seeking careers advice before undertaking their course.

Box 4: Information barriers for postgraduate study

There is mixed evidence on the extent that information constraints exist for postgraduate students. Motivations to study and the nature of information barriers facing prospective postgraduate students are likely to be different from prospective undergraduate students because of their different characteristics. For example, in 2009/10, 70% of total postgraduate students in the UK were aged over 25 years old. Nearly half of postgraduate students study part-time, of whom the vast majority (90%) are aged over 25 years old (HESA, 2011). Many of these part-time students remain in employment throughout their studies allowing them to earn as they study.

Although it might be expected that existing undergraduate students face fewer information barriers about postgraduate courses available to them, only 20% of postgraduate students enter directly from undergraduate studies (BIS, 2010). Evidence suggests that there are numerous reasons why prospective students may or may not undertake postgraduate courses. A survey in 2006 by Prospects and the National Postgraduate Committee, via the Prospects website, looked at the motivations and perceived barriers to postgraduate study of both prospective and current postgraduate students. It found that most respondents who stated that they did not intend to pursue postgraduate study indicated financial concerns to be major factors. The factor identified as the strongest influence on their decision not to conduct postgraduate study was tuition fees, with almost three quarters stating that this had been a strong or very strong influence on their decision (74.3%). Other factors cited as a strong or very strong influence were: debt from previous study (62.9%); lack of funding opportunities (67.5%); or that postgraduate courses were too expensive (58.1%).

Another study during the 2006/07 academic year (Higher Education Academy, 2008) surveyed 1,073 students in their final year of undergraduate study at two different HEIs. This found that the two main reasons given by those not intending to progress to postgraduate study were to 'enter employment' and needing 'a break from study'. While respondents who were worried about incurring further debt indicated that they were less likely to undertake postgraduate study, the actual level of debt incurred did not indicate any significant effect on students' intentions to study at postgraduate level. Chapter 3 identified that most of the evidence available to date demonstrates entry to postgraduate study is not influenced by socio-economic background.

Solutions to imperfect information

The problems caused by imperfect information in higher education markets can be overcome with specific targeted measures. In response to uncertain future returns, by offering income-contingent loans, the government can pool the risks of non-repayment and therefore allow risk-averse students to undertake HE, making all parties better off.

The market failures in credit markets underpin the rationale for governments to provide student finance, in the absence of provision by a private market. Barr (2005) argues that a well-designed student support system involves loans that:

- Are income-contingent;
- Are large enough to cover fees so higher education is free at the point of use; and,
- Attract an interest rate broadly equal to the government's cost of borrowing.

Income-contingent loans contain an inbuilt insurance against non-repayment as well as protecting the lender from the risk of making an unsecured loan (in the absence of collateral) because repayments are collected alongside income tax. Accordingly, in the UK, the Student Loans Company (SLC) was established to provide loans and grants to domestic and EU undergraduates in colleges and universities across England, Northern Ireland, Scotland and Wales.⁹⁵ Due to the failures in private credit markets identified above, the SLC is a publicly-run organisation. Even in the market-driven US system, a large proportion of student loans are provided or underwritten by the Federal government.

In terms of higher degrees, postgraduates' characteristics differ greatly from their undergraduate counterparts and there is mixed evidence on information constraints and motivations to study facing prospective postgraduate students. The funding system for postgraduate students therefore differs from that available for undergraduate students. In 2007/08, around 60% of UK and EU domiciled postgraduates in English HEIs were funded by private sources (self funded, family support or employer).⁹⁶ In the same year, around 30% of UK and EU domiciled postgraduates in English HEIs received public funding – including government support for teaching, social work and some health professions.

There is some funding support from Government available through Research Council grants. BIS (2010e) estimate Research Councils fund a minimum of 8,000 PhDs every year.⁹⁷ In addition, professional and career development loans (PCDLs) are commercial loans subsidised by government and available to UK residents to undertake career development for use on top of other sources of funding. In 2008/09 only around 1,750 PCDLs were taken up by UK students undertaking postgraduate studies.

Positive Externalities

Chapter 3 identified that Higher Education does not just generate benefits for the individual but also a range of social and wider economic benefits such as increased civic engagement or reduced public expenditure on healthcare. In addition, spillovers

⁹⁵ There was a single UK HE system when the SLC was founded.

⁹⁶ HEPI and the British Library (2010).

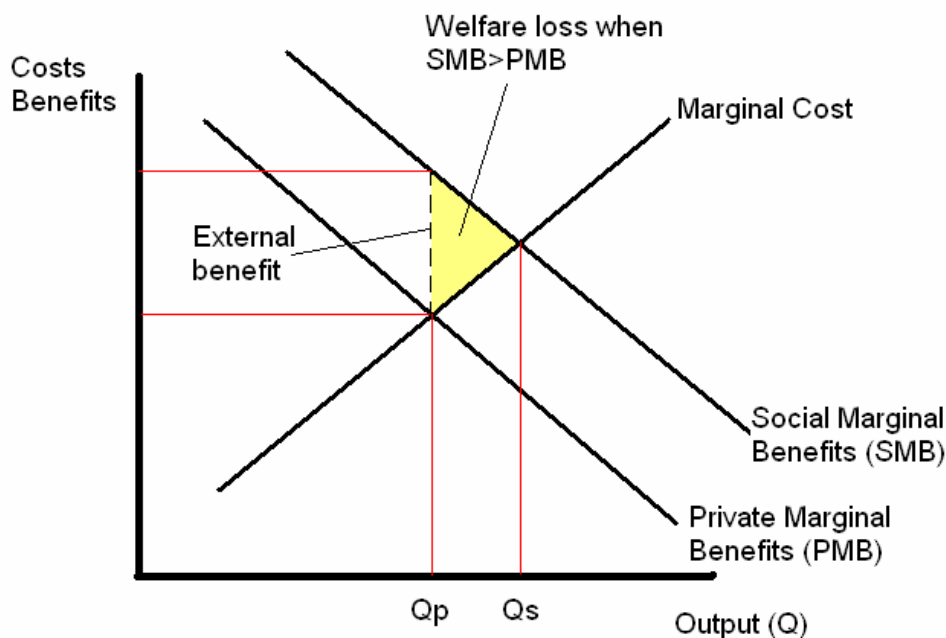
⁹⁷ Some Councils report on fully funded PhDs only, hence only a lower bound is estimable.

from human capital accumulation can increase productivity more than the direct productivity effect for the individual accumulating those skills. This suggests that the social returns to education may exceed the private return. One study, for example, estimated the social return to HE based on data from the United States (Moretti, 2004) and found that a percentage point increase in the supply of college graduates increases the wages of high school drop-outs by 1.9%, high school graduates' wages by 1.6%, and college graduates wages by 0.4%.

Economic theory suggests that individuals will invest in higher education up to the point where the private marginal benefit (PMB) equals the marginal cost (MC). However, there are additional benefits to society (SMB) which are not considered by the individual when making their decision to invest in HE. As a result the optimal level of investment from society's perspective may exceed that which individuals would make, causing lower investment in HE than would be socially optimal.

Figure 40, presents a simplified illustration of a free market outcome where the existence of positive externalities increases the optimal level of output from Q_p to Q_s . This depiction is also simplistic in that individuals' decisions to invest in HE are not continuous, but more lumpy, often reflecting a choice between two discrete options; whether to invest for a short period of time (perhaps two or three years) or not to invest at all.

Figure 40: A sub-optimal free market outcome due to presence of positive externalities



Externalities can present a strong theoretical case for public investment in HE although their presence alone does not necessarily warrant government intervention. The case depends on the extent of efficiency loss that a free market would create, i.e. how far consumption would be below the socially optimal level of HE. This is determined by many factors. One factor is the gradient of the demand curve (i.e.

price elasticity); if demand is price inelastic, the demand curve is vertical and $Q_p=Q_s$ then there would be no efficiency loss and therefore no case for a subsidy (Barr & Shepherd, 2010). Where there are large average private returns from higher education, in addition to externalities, the responsiveness of students to price may be low, and therefore the efficiency loss may not be large. But it is likely that this condition will not hold for all different groups of prospective students. Therefore, for some, a free market may create a larger deterrent effect (or greater externalities) which does create a rationale for government intervention in some areas.

However, it is difficult to estimate the magnitude of all the social or external benefits that stem from people undertaking HE. It is especially difficult to identify the differential benefits amongst certain groups (which could be formed of students at particular institutions, or taking certain subjects) and thus the appropriate level of public investment for each group. To do this it would be necessary to fully distinguish between non-monetary effects that ultimately benefit the individual (such as the improved quality of life from better reported health) and effects which benefit society more widely (such as savings to the NHS or more tolerant attitudes). But Chapter 3 has shown that quantifying the size of the external benefits from higher education, either in absolute or relative terms, is extremely difficult. Whilst some studies suggest that externalities are roughly half the size of overall private returns, there is no consensus on the issue. Quantification of several non-monetary factors is highly uncertain, as identified by Barr (2004), and an individual's perception of their private benefits may be more relevant than the actual level.

In addition, it is likely the positive externalities and spillovers from HE vary by subject, as private returns do (as shown in Chapter 2). Therefore, the optimal balance between public and private contributions is unlikely to be constant and thus especially difficult to estimate accurately, especially in aggregate.

As a result of these differences and measurement difficulties there are differing levels of public investment across countries. Some countries have chosen to vary the required level of student contributions according to broad groups of subjects whilst others have maintained flat tuition fees for all subjects. There are several cases of countries investing more public money in strategically important or expensive to study subjects. Australia, for example, varies the level of public and private contribution according to bands of subject which depend on average graduate wages and strategic national importance.

Equity (widening participation and fair access)

A rationale for government intervention in Higher Education can also be made on equity grounds. The evidence presented in previous chapters suggests there are many equity challenges for HE. Specifically, the market failures around imperfect information described in the sections above are disproportionately experienced by some groups, giving rise to an equity problem in the market for HE (Barr, 2004).

Information barriers about the potential future benefits of HE are disproportionately faced by those from lower socio-economic groups, women and ethnic minorities. For example, Purcell et al. (2008) show decisions about whether to undertake HE and which institution to attend are influenced by socio-economic and cultural factors such as parents' socio-economic background and experience of HE. 'Traditional' applicants to HE also have access to the widest range of careers information and advice to inform their decision. Gorard et al. (2006) note a range of research indicating that it is those students with the fewest informal sources of information, advice and guidance that were least likely to get it from formal mechanisms. This is particularly true of A-level students in FE colleges, those on vocational level 3 courses, and those in rural and deprived areas.

As summarised by Callender (2003), poorer students tend to be more debt and risk averse and credit constrained. Greater information barriers among lower income groups may contribute to greater levels of risk aversion and less willingness to borrow the finance they need to undertake HE. This is despite a greater finance need. The supply of finance might also be affected – in the face of inadequate collateral disadvantaged students would not be offered finance by lenders (who could 'cherry pick' the less risky borrowers), resulting in disproportionately high barriers in accessing finance for those groups.

Rationale for government intervention

The market failures that exist in Higher Education underpin the economic rationale for governments to intervene. There are a number of small- and large-scale interventions governments can undertake to bring the level of HE investment closer to the efficient level. These include public subsidies for teaching, provision of student finance (grants and loans for maintenance and fees), information and regulation. There is no single approach to tackle these problems – the range of interventions governments make is evident from the varied international systems presented at the beginning of this chapter and, for example, other OECD comparisons.⁹⁸

Determinants of an efficient system

Whilst there are clearly many reasons for government intervention in HE, any such intervention must be made carefully so that in achieving the various aims, inefficiencies are minimised and there is nothing to prevent the socially optimal outcome (as far as it is known) from being achieved.

The current HE system is designed to address some of the key market failures through:

- The provision of grants and loans for undergraduate tuition fees and maintenance to ensure no students face up-front costs of undertaking HE;

⁹⁸ Chart B5.2. Public subsidies for education in tertiary education, 2007 in OECD (2010a).

- Providing grants for those from low-income households and repayment protection for low future earners to mitigate against risk aversion;
- Exploiting positive externalities through the measures above, as well as offering teaching grants to institutions to increase the supply of and demand for places; and,
- Providing Professional and Career Development Loans and grants to reduce the effect of market failures amongst postgraduate students.

Balanced public and private contributions

Public investment in HE, or having the costs of HE borne by taxpayers, is justified where there is robust evidence that the external benefits from HE lead to an inefficiently low demand for higher education. Chapter 2 showed there are consistent and measurable private monetary benefits of HE (although they vary by country, institution and individual). Following on from this, Chapter 3 presents evidence of significant externalities and private non-monetary returns, but of a more uncertain magnitude. It is not known, therefore, what the total net public and private returns from higher education are, suggesting the type and scale of government intervention required is complex.

There is strong evidence to suggest that the current average levels of individual contributions are significantly below marginal private returns from HE. This is true even before non-market returns are considered. This suggests there is potential for graduate contributions to be raised but still be below the marginal private return, and for participation to not be negatively affected (provided this change is met with an appropriate student support package⁹⁹). The proposed new student support package and more progressive repayment system based on future earnings means that the government can maintain the incentive for individuals, assuming they are rational, to invest in their higher education even whilst their graduate contribution is raised.

Quality

The Browne Review (2010) identified that the current mechanism of block grant public funding for teaching creates a lack of competitive pressures among HE institutions. The Higher Education Funding Council for England distributes this grant to universities for eligible students attending. However, this weakens the link between the student and the institution which potentially reduces the incentives for HEIs to compete on price, quality or efficiency to attract students to attend their university as well as the incentives for institutions to improve their performance.

Benefits from competition may also be possible from the rebalancing of public and private contributions. Currently the private costs of HE do not reflect the private benefits which means that price signals in the market are distorted. Price provides important signals about supply and demand and as such may improve student

⁹⁹ BIS (2010d).

choices about whether to invest in HE and choices in where/what to study. Economic theory¹⁰⁰ suggests that better price signals could drive competition in HE by making universities more responsive to the preferences of students and the needs of employers, thus improving welfare. A full discussion of price and quality is contained in Chapter 6.

Long-term sustainability

The long-term sustainability of a higher education system is also important to ensure all of the previously identified benefits from HE can continue to be realised. Meeting the cost of HE through purely public funding is difficult for the following reasons:

- Unit costs of higher education are high and increasing (because they are both relatively capital and labour intensive and cannot benefit from labour saving techniques);¹⁰¹
- There is increasing demand for student enrolment due to demographic changes, rising school attainment and demand from mature students;¹⁰² and,
- There are many demands on public funds which creates opportunity costs for investing public funding in one area over another. This is especially pertinent in the current climate of tighter government budget constraints.

Given the significant private benefits and the pressure on public funds, it is legitimate to consider a greater variable graduate contribution. There are currently additional pressures in the UK to reduce the fiscal deficit which led to the decision in the Spending Review 2010 to reduce in real terms the overall resource grant budget for Higher Education (excluding research funding) from £7.1 billion to £4.2 billion by 2014-15. Given this budget reduction, it would not be possible to continue to support the HE system under the current arrangements unless there were large reductions in the number of students entering HE or large reductions in the unit of resource per student.

Reducing the number of student entrants in this way would result in large foregone benefits, for example for potential students through foregone future earnings and wider losses in terms of foregone productivity gains, wider benefits and employment potential.¹⁰³ Alternatively, a mass high-quality HE system would require significantly higher levels of taxation or high opportunity costs of government expenditure. Countries such as Denmark, which does not set graduate contributions, operate an implicit 'social contract' where generous welfare provision is offset by higher levels of general taxation.

¹⁰⁰ See for example, Barr (2004).

¹⁰¹ Woodhall (2004).

¹⁰² Browne Review (2010, p22).

¹⁰³ BIS (2010c).

Equity

Equity is an important determinant of the efficient HE system and is particularly important in a predominantly public funded system. Where public funding in HE is covered by contributions from the taxpayers, these taxpayers take the burden regardless of whether they are graduates and have privately benefited from HE. Chapter 2 identified that graduate earnings are significantly greater over a lifetime compared to someone who does not have a HE qualification and accordingly their contributions to the tax base are greater. That discussion was based on London Economics research (2011) which estimated the gross Exchequer average benefits (the enhanced tax, National Insurance and VAT paid over the lifetime of an HE graduate compared to someone with two or more A levels) to be around £110,000. The model included the costs to the Exchequer (in the form of student support, HEFCE funding and foregone taxation due to the individual studying and not working) and indicated net Exchequer benefits of just under £90,000 per graduate on average.

Whilst this research shows there are average Exchequer benefits from those undertaking HE, it does not differentiate across the taxpayer distribution or identify the potential burden on taxpayers who have not themselves benefited from HE.

Information

The evidence on imperfect information in HE was discussed above. Despite government interventions to mitigate the impact of this, the Browne Review (2010) identified several areas in which information barriers still exist and thus concluded the need to ensure students receive the high quality information they need to help them choose the institution and course that best match their aspirations. This is discussed further in the next chapter.

Conclusion

In light of the constraints in the current funding system and the rationale for government intervention to overcome inherent market failures, the case for rebalancing contributions in the HE funding system is justified on grounds of efficiency, equity reasons and long-term sustainability.

Accordingly, in November 2010 the Coalition Government announced its proposed reforms for the HE funding and student finance system and the White Paper which this paper accompanies sets out other aspects of reform in HE. These reforms are consistent with:

- A continuing role for government to overcome the credit market failures and provide the necessary finance to prevent barriers in access, and grants to overcome debt aversion amongst certain disadvantaged groups;
- A continuing role for government to directly support HE on the basis of the existence of positive externalities and spillovers;

- The removal of information barriers so that individuals make more rational decisions; and,
- Driving a more competitive HE system.

6. A Responsive and Dynamic System of Higher Education

Summary

There is a large established HE sector in England, with active participation from HEIs, students, government, and, increasingly, employers. While, as a result of market failures and government intervention, there are a number of constraints on the sector, it does have some features of a quasi-market. Price and non-price factors are both important for influencing behaviour in the sector. Evidence shows that price does have an impact on student participation, but that any negative participation effects from past price changes have been offset by government provision of student support (loans and grants). The lifting of the fee cap has the potential not only for greater student contributions, but greater variation in the prices (including via scholarships and bursaries) and offers of different HEIs. Non-price factors are also of importance, such as the information available of the different options available to students, the reputation and quality of institutions and the 'total offer' (such as broader facilities available). While price competition is likely to become more important, these non-price factors are likely to remain central to the nature of competition in the sector in the future.

Introduction

As we have seen in previous chapters, a successful HE sector is vital not only for generating economic growth and wider benefits to society, but also for supporting greater social mobility. The previous chapter has looked at the role of government in enabling a successful sector to develop, but also shown that there is no single clear-cut way for government to intervene to address market failures. Ultimately the success of the sector depends on the actions of all those involved – government, HEIs and students.

This chapter will look at how far market behaviours exist and the different factors influencing the behaviour of participants. While the HE sector is involved in a range of different activities, this chapter focuses on undergraduate teaching, but recognises the wider activities that also have an impact on behaviour.

A Quasi-Market for HE

Markets are a mechanism through which buyers and sellers interact in the trade of goods and services. The boundaries of markets are not easily defined, but may be

thought of in terms of the choices that customers are able to make about substituting between products or the choices of suppliers in switching production.¹⁰⁴

Competition in markets is important for allocating resources efficiently – both to different activities within an economy (allocative) and in producing different goods and services (productive). Competition between market players can lead to increased efficiency, lower costs, lower prices, increased quality, and increased productivity through greater incentives to innovate.

Competition does not just depend on the behaviour of suppliers, but also of customers and consumers. The ability of customers to switch between different products and suppliers, the information they have available about the different options available to them, as well as their ability to assess products, will also be an important factor in the nature of competition in a market.

It is often easier to think about a market in a situation of perfect competition – that is, identical products, many suppliers, perfect information for customers, all firms have access to the same resources for production, no barriers to entry or exit, and no externalities.

However, competition and markets rarely work perfectly, and situations of imperfect competition are more relevant. That is, when non-identical products can be substituted for each other, or there is a chain of substitution in place which different customers can choose between, in addition to, imperfect information and access to resources, barriers to entry and exit, and externalities. Moreover, the existence of market imperfections does not mean that there is automatically a role for government, for example where government action would have little positive impact or potentially create additional problems in the market. These interactions of the supply and demand for goods and services will lead to the determination of prices, quality and quantity of a particular good or service in the economy.

HE in England

The HE sector in England has many suppliers, a large customer base and defined products. Individuals are able choose whether to undertake HE, and if they do, which HEI they go to and which course they do (and are not constrained to the UK in that choice¹⁰⁵). There is a real choice for students to make, with a range of different products available at a diverse range of institutions. The sector also has established market infrastructure within which to operate, ensuring that the rules and regulations are in place to give both HEIs and students confidence in the products and preventing unscrupulous behaviour.

The previous chapter set out a number of market failures that characterise the HE sector. While these do not automatically mean there is a role for government or a single solution for addressing them, there is a case for government in attempting to identify where action may mitigate the impacts of market failures.

¹⁰⁴ More on market definition can be found OFT (2004).

¹⁰⁵ Analysis of OECD data (e.g. see BIS (2010b)) estimates that in 2005 around 22,400 UK students were studying abroad.

So while a pure market solution may not be feasible for HE, government intervention can still support quasi-market solutions.

Even with the limitations of developing a full market for HE, some assessment of the boundaries of a quasi-market is needed in order to understand how HEIs compete with each other.

OFT (2005) looked at relevant markets for assessing competition in the HE sector. The OFT assessment focused on specific areas of overlap and as such, a number of areas were separated out for assessing competition, including: undergraduate and postgraduate courses (and within this, by taught and research courses). It also segmented by course title, although the assessment noted that universities said that there was supply-side substitution, with examples of new courses introduced by universities. For both undergraduate and postgraduate courses, the geographic scope for competition was considered to be the UK, but with some constraints from overseas HEIs (although this is likely to vary by HEI, and may be greater for those that feature more in the international league tables). For part-time courses, it was noted that the constraints may be more regional.

Becker and Round (2009) emphasise the importance of viewing higher education as a number of separate markets. Since different universities may compete for different types of student and outputs, demand- and supply-side characteristics of universities may not always be similar enough to constitute a single market. However, it is not always clear how the boundaries between separate markets in HE can be drawn.

The OFT did not conclude on whether newer universities competed with those from the Russell or 1994 Groups.¹⁰⁶ However, analysis of a number of factors shows considerable overlap in the relative performance of 'old' and 'new' universities. For example, Figure 21 in Chapter 2 shows that while the old universities, particularly for STEM subjects, dominate the top end of the average earnings scale, there is a large overlap between the average earnings distributions for the different institutions. It is also important to note that it is not just the institution and subject group that will have an impact on average salaries, but also a range of other factors including previous qualifications.

HEIs undertake a broad range of activities, not just teaching. While these broader activities are complementary to HE teaching activities rather than substitutes, these other activities, particularly research, can impact on the total offer of an HEI and the nature of competition between HEIs.

Even without the constraints of full market conditions, HEIs do still have scope to compete with each other for students. OFT (2005) concluded that non-price factors were likely to be important factors in the nature of competition between HEIs, noting course content, quality of tuition and reputation as potential key factors. In order to understand competition in HE, the next sections will look at the factors influencing the behaviour of both consumers (students) and producers (HEIs).

¹⁰⁶ The Russell Group comprises 19 research-intensive universities; the 1994 Group is a similar group of 17 research universities. New universities are post-1992 (see box on regulation).

Factors Driving Student Behaviour

Students are the main consumers of HE, although more broadly employers are also customers – indirectly through graduate recruitment, but also to some extent directly through sponsorship of courses and students.

Chapter 2 has set out the main benefits to students from engaging in HE. Although quantified private returns are unlikely to be the only reason they undertake HE, BIS (2009) noted the relative importance of the potential financial return on the choice of subject (rather than the decision around HE participation). Case studies (for example, HEA (2006)) found that this was likely to become a more important factor as student contributions increased. However, other factors are also important, such as personal interest and aptitude in a particular subject area, as well as influence from family and friends, teachers and careers advisers.¹⁰⁷

As well as the subject choice, students also have a number of options available around which HEI to study at. Important factors here include entry requirements (for example, UCAS Tariff Points¹⁰⁸), reputation, league tables, location, future career prospects and other facilities available. Survey evidence¹⁰⁹ also suggests that different factors will have various weights of importance depending on the ‘student group’. For example, overall image and social life appear to be more important to younger students (under 21 years), with distance from home being an important factor for mature students (25 years and over).

Growing evidence in behavioural economics has identified ‘behavioural biases’¹¹⁰ in the way individuals make choices and interact with producers which come from a number of factors.¹¹¹ These include the level of experience an individual has (which may allow them to learn and adapt behaviour through repeat transactions), limitations to the amount of information that they can take account of in making their decision, uncertainty about the future, caring more about losses than gains, and personal values and beliefs. These behavioural biases may influence the way students make their choices regarding HE, in particular:

- Many students have limited (direct) experience of HE and are unlikely to enter into repeat transactions (in a timely way) that enables them to learn from previous experience – that is, they are unlikely to undertake another first degree, straight away, if at all (although they may be able to use their experience in their first degree in making future choices about higher degrees);
- There is a lot of information available to students in making choices about HE in a wide range of formats and sources. However, there may be limitations to how much students are aware of what they need to know (particularly where their

¹⁰⁷ Institute for Employment Studies (1999).

¹⁰⁸ UCAS Tariff Points: http://www.ucas.ac.uk/students/ucas_tariff/tariffables/.

¹⁰⁹ IES Survey, 2008/09.

¹¹⁰ For an overview of the literature see DellaVigna (2009).

¹¹¹ For more detailed discussion on behavioural economics and markets, see OFT (2010).

parents have not been to university) or limitations to their ability to absorb and process the different information to make a choice; and,

- While there is evidence that, on average, graduates will benefit from increased earnings relative to not having a degree, students do not know in advance what their own future earnings will be.

Availability and Use of Information

Information asymmetries are a source of market failure in HE and an area where government intervenes to ensure that information is available to students to aid their decision-making. However, behavioural biases mean that the amount of information available is not the only factor that will prevent the efficient operation of a market. The ability of people to identify, access, understand and use it to inform their decisions is also important – not only about whether to participate in HE, but also what to study and where.

There is a large amount of information available to prospective students about the value of undertaking HE (such as employment prospects, earnings of previous graduates), the different courses available,¹¹² the quality of those courses (for example, student satisfaction surveys, success rates), as well as various league tables, reputation and marketing. The amount of information available, the tools to analyse the information¹¹³ and increased provision of independent websites with tools to facilitate sorting and comparing information, is making it easier for students to use and compare courses and HEIs, but there is still room for improvement in the type, consistency and quality of information provided.

HEFCE (2010c and 2010d) research recently analysed the kind of information that users needed to make their decisions and how existing information is being used. While a large amount of the information students identified as being important was available when students searched for it, the research found that only a minority actively searched for the information they wanted, suggesting that greater awareness of sources of information may help student decision making. An earlier IES (1999) survey found that popular sources used by students were university prospectuses and visiting the HEIs. While these surveys suggest that students are not making use of all the information available, Barr (1998 and 2000) argues that students are generally able to make efficient choices because they are either well informed or have the time and capacity to become well informed. Although, he also notes that students from more disadvantaged backgrounds may need a greater level of support to increase their knowledge and aspirations in HE.

However, even where students are using information to inform their choices, this needs to be matched to the requirements of the HEI and course, particularly related

¹¹² Via UCAS, university prospectuses, HEFCE, HESA.

¹¹³ For example, HEFCE and UCAS provided Unistats website: <http://unistats.direct.gov.uk/englishIndex.do?t=20120417122846842> .

to their ability (normally measured through qualifications e.g. A Levels). Where there is high demand for high quality courses, HEIs are able to have higher entry requirements and specify the subjects required – acting as both a signal to students as well as a screening mechanism for institutions to identify the higher quality students.

Impact of Introduction of Fees

Since 1998, English HEIs have seen the introduction of fees for full-time, home and EU, undergraduates in two stages. First the introduction of a £1,000 flat fee for all students in 1998/99, and then the introduction of a variable fee with a cap of £3,000 per year in 2006/07 (rising annually in line with inflation).¹¹⁴

While at the moment there is provision for variable fees to be charged by HEIs, in practice there has been very limited price variation on undergraduate courses for UK and other EU students. The vast majority of public universities currently charge the same (maximum) price¹¹⁵ – the current fee cap level of £3,375 per year in academic year 2011/12 – but there are also a smaller number of private providers with different fee structures offering whole first degrees, with prices ranging from those comparable to the publicly funded HEIs to around double.¹¹⁶

In theory the availability of first degrees from HEIs that are not publicly funded increases the choice available to UK students. However, in reality the choice is not a straightforward comparison of ‘ticket prices’ of a course or institution, but also about the finance available to them. HEIs that receive public funding (such as the HEFCE teaching grant) comply with additional regulations and controls including fair access and those which manage the burden on public finances, such as student number controls. Those that do not meet these additional conditions will potentially be less attractive to full-time, home, undergraduate students, as access to maintenance grants and loans provided by government will be limited (e.g. fee loans in 2010/11 are available up to the maximum of £3,290 per annum, which may not be sufficient to cover the fees at alternative, qualifying HEIs), or not available at all.¹¹⁷

Furthermore, as noted above, the choice made by students is not limited to price – reputation, quality and the total offer are also important factors taken into account. Of particular relevance to a number of newer providers, the range of subjects offered may also be a constraint, with many offering a more limited choice with courses focusing on business, law and accounting.

¹¹⁴ Fees for part-time students are not currently regulated.

¹¹⁵ In 2009/10 only three English HEIs proposed to charge below the current maximum, Universities UK (2010).

¹¹⁶ It is important to note that tuition fees of private providers are not directly comparable given differences in the offer, such as variation in study modes, including studying for two-year degrees.

¹¹⁷ For the purpose of student support, HEIs which are not publicly funded (e.g. via the HEFCE teaching grant) may be specifically designated to attract student support on an individual basis. They must all be accredited by a recognised UK awarding body such as a university, or have their own degree-awarding powers. For example, students undertaking courses at the University of Buckingham are able to access loans of the same value of those available to students going to public universities, but need to find additional funding from other sources to top up the fee payments.

The introduction of variable fees in 2006/07 does not appear to have had a long-term effect on student demand for HE places in England. A series of studies by Universities UK (2008) have analysed changes in the pattern of demand for HE places in response to the increase in fees, for different modes of study, subjects and from different student groups. While there was a slight decline in applications in the first year of the variable fees, this appears to have been reversed in subsequent years.¹¹⁸

Evidence of the impact on student choices from the introduction of fees is limited, however. A qualitative study by Rolfe (2001) conducted interviews of university lecturers to try and ascertain the effects of the introduction of tuition fees of around £1,000 in 1998. The perceptions indicated an increasing degree of consumerism, including a trend towards increased focus amongst students on career-relevant aspects of courses. This suggests a further increase in price could see greater demands from students on what HEIs are providing.

The upcoming changes in funding arrangements aim to ensure students will be further empowered to choose the courses that they are best suited to and of the right quality and reputation. The lifting of the fee cap also has the potential for more variation in price, and for HEIs to use price to attract students – reflecting variations in the different offers, value for money, efficiency, or where universities are increasing investment in particular aspects of their teaching offer.

The high levels of applications for HE places suggest that there is excess demand in the system. UCAS data for 2010 shows that there were just under 700,000 applicants, a 9% increase from 2009, but, while the number of places available increased, there was also an increase in the number of unplaced applicants, around 34% compared to 2009. However, it is important to note that of the unplaced applicants in 2010, provisional estimates from UCAS (2010a) note that around 45% declined offers or withdrew their applications, and a further 1% had outstanding offers. Furthermore, in 2010, the number of applicants reapplying was 39% of unplaced applicants in 2009, 9% of total applicants in 2010, suggesting that reapplications may be a better estimate of unmet demand than the total unplaced applications. The latest data from UCAS on applications this year suggests continuing high levels of applications.

The existence of excess demand could dampen price competition between HEIs. However, price is not the only factor that will drive competition between HEIs for students, as we have seen in England to date. The nature of behaviour of both HEIs and students will be considered in more detail throughout this chapter.

It is important to note that not all aspects of HE teaching are subject to price caps, and while different levels of courses may not be substitutes for students, there is overlap in the resources used by HEIs to provide these courses. Pricing for these products may help understand HEI pricing constraints.

¹¹⁸ Faggian (2010) studied of the impact of fees in Northern Ireland using postgraduates as a control group and found similar results, but noted the data limitations given the length of time since fees were introduced.

Postgraduate study is not completely unregulated, but is not subject to the same price caps or access to student support in the same way as undergraduate courses. Fees for UK and other EU students have in the past tended to be linked to the level of funding provided by Research Councils for postgraduate research students (£3,732 for 2011/12¹¹⁹), although prices do vary by institution and course, as well as for non-EU students.

UK students are able to apply for subsidised government backed loans¹²⁰ when undertaking training and skills development for enhancing future career opportunities, which can be used for publicly funded HEIs as well as approved private providers. However, government involvement in these loans is limited, and decisions on whether to lend to individuals is made by the banks.

HEIs are also able to set their own fees for international students and are not subject to fee caps - data collected for 2011/12 indicates that fees range from £6,600 to £20,470 for undergraduate courses.¹²¹ Similarly, there is variation across both institutions and courses for postgraduate study – in 2011/12 fees range from £7,120 to £35,600. At all levels of study, there is also variation in the prices charged for UK and other EU students, compared to those for international students, with fees for home and EU students at undergraduate level capped at £3,375 in 2011/12 but with greater variety for postgraduate study, with many institutions charging under £10,000, but exceeding £15,000 in some cases. As noted above, the prices charged for international students will be constrained by competition from HEIs in other countries.

Student Response to Changes in Fees

The response of students to an increased contribution to the cost of HE is uncertain, but will be influenced by a number of factors, including the price elasticity of demand and also how they view the change in fee level. There are important interactions with the level and type of support available (particularly as there is provision such that students do not pay upfront).

What is difficult to estimate is the exact price elasticity of demand (how responsive student demand is to a change in price).

There is some evidence that HE is a 'normal' good in the sense that an increase in price will lead to a fall in quantity demanded. IFS (2010) research found that a £1,000 increase in fees results in a 4.4 percentage point decrease in university participation, while a £1,000 increase in loans results in a 3.2 percentage point increase in participation, and a £1,000 increase in grants results in a 2.1 percentage point increase in participation. However, there are limitations to how broadly this result can be applied to the changes in the fee caps currently being made which may result in higher prices and more variation across HEIs.

¹¹⁹ RCUK (2010).

¹²⁰ Professional and Career Development Loans.

¹²¹ www.publicgoods.co.uk

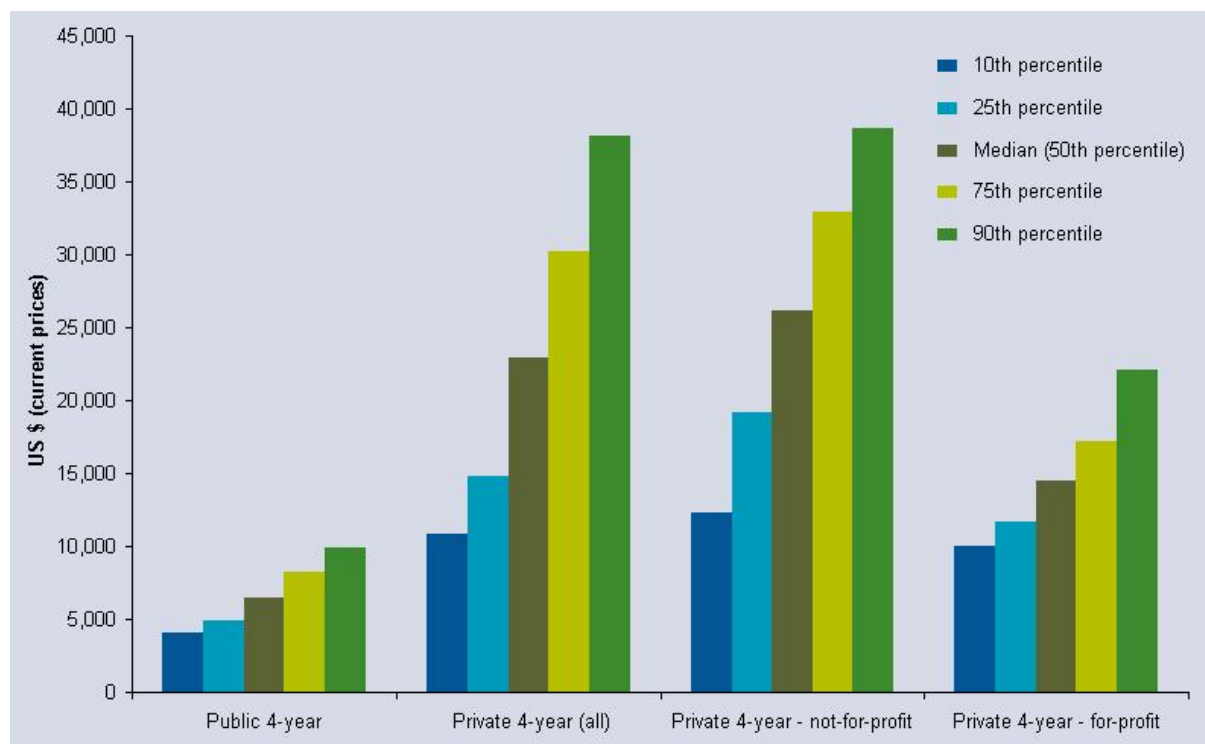
Economic theory suggests that the following factors may be important in influencing the responsiveness of student demand to price:

- **Household income:** students from lower income backgrounds are likely to have more elastic demand – that is, they may be more sensitive to increases in price, as the fees will represent a larger proportion of householder income. However, government also provides student support in a number of forms, with grants available to students from the lowest income backgrounds, the new National Scholarship Programme, as well as bursaries and scholarships provided by individual HEIs. These help to offset the increase in price, but may be subject to information failures.
- **Available alternatives:** where there are fewer alternatives for students to switch to, they may be less sensitive to increases in price. However, as noted above, while there is a great deal of diversity in the provision of HE in England, there would not appear to be any sub-set of HEIs that compete only with each other, and that there is more likely to be a chain of substitution across providers. The availability of alternative options outside HE will also be relevant, such as career options open without HE qualifications or on the job training (such as apprenticeships).
- **Level of certainty about possible employment opportunities or future wage returns:** where there is greater uncertainty about future returns, students may have more elastic demand. This may mean that for subjects with higher returns on average or where there are clearer career paths (for example, law or medicine) students are less price sensitive. However, given general uncertainty about future returns, this is likely to apply across all institutions and subjects to some degree, particularly for new courses and providers (where it takes time to build up a reputation).

There is also uncertainty as to how much HE could be influenced by the so-called Veblen effect – where students may view ‘higher prices’ as a signal of higher quality or have an element of prestige attached to it that they do not attach to ‘lower priced’ HEIs. In the US where fees are uncapped, there is a broad range of prices charged, ranging from just over \$4,000 per year to nearly \$40,000 per year (see Figure 41 below).¹²² This is likely to be a reflection of a number of different factors, for example a separation between HEIs looking to attract more local learners, and the more research intensive HEIs looking to compete with the best HEIs on a global scale. However, there are important differences with the US system which will also potentially have an impact on what happens in the UK, including the existence of the price cap.

¹²² There are some concerns that the high prices (which have been increasing in excess of inflation over the last couple of decades), combined with a growing interest around the value for money of HE courses, as well as growing constraints on accessing finance, are feeding into an ‘HE bubble’ in the US. However, there is much debate on whether HE is a bubble, particularly given the important differences with other assets that have experienced bubbles (e.g. HE does not have the same resale features as assets like housing). In addition, there are also important differences between the UK and the US, such as the cap on fees and continued provision of finance by government.

Figure 41: US undergraduate tuition fees for full-time students in degree-granting institutions by percentile of charges and control and type of institution, 2009/10



Source: US Digest of Education (2010)

Assessing the responsiveness of students to fee increases is not straightforward given that: (i) fees are not upfront; and, (ii) loans with income-dependent repayments will be available.

At the extremes, students may either see the increase in fees as an increase in the upfront costs, or, they may not view future repayments as representing a direct increase in the price of HE.¹²³ The actual increase in price perceived by students will lie somewhere between these extremes, but where depends on how heavily future repayments are discounted.

However, it is not just the price of HE that will be relevant, but also the package of support that is available, including government loans and grants, as well as bursaries and scholarships, such as those provided by HEIs. As set out above, IFS (2010) found that increases in the loans and grants offered by government had a positive off-setting effect on previous fee increases. While we would expect this to remain true with the latest changes, the quantified impacts may not be directly transferable given the scale of change.

¹²³ Note that while the monthly repayments will be lower on the new loan terms (because of increased repayment thresholds), students will potentially be repaying for a longer period because of smaller repayments, higher interest rates and increased size of loan.

Factors Driving HEI Behaviour

The majority of English HEIs are not-for-profit organisations with a broad set of activities and objectives underpinning their activities – including quality and excellence of teaching and research and the general welfare of their students. This implies that a normal profit-maximising assumption would not apply to HEIs – we would not expect to see universities being driven to set price at a market clearing level, as they are not just interested in revenue, but also in attracting high quality students. That said, revenue raising is not an irrelevant consideration and is essential for ensuring the resources to maintain investment and attract high quality staff. However, revenue raising from student tuition fees at any cost is not the right approach either, ensuring that students have the right entry grades and ability to maintain the reputation of the institution is likely to be of greater importance. In this respect, students are not just customers, but also important inputs for HEIs. Qualifications are an important part of the entry criteria, but HEIs also look for broader evidence of quality from students, for example volunteering or sports achievements. While a number of papers have explored a precise definition of what universities are attempting to maximise (for example, Bamberger and Carlton (2004), Winston (1999)), it is difficult to specify exactly what they are attempting to maximise, but some measure of quality is common across many studies.

Impact of Introduction of Fees

The introduction of variable fees in 2006/07, has not led to an actual variation in fees charged for home and other EU undergraduates undertaking HE in England (with the few exceptions mentioned earlier). In theory, variable fees provide incentives for HEIs to be more responsive to students and employer needs through how they allocate their resources – incentivising greater efficiency. In addition, it will affect how they set a price for students and how they use the additional resources they bring in through variation in the fees charged.¹²⁴ In practice, there has been no price competition (relating to prices for home and other EU undergraduate students) with a fee cap at this level.

There are a number of reasons why the introduction of variable fees with a fee cap may not have led to variable fees in practice in HEIs.

First, there is already a wedge between the funding some English HEIs receive for home and other EU students compared to the income they are able to generate from international students for the same qualification. For example, data collected in an annual survey undertaken by Universities UK¹²⁵ shows that the median charge for undergraduate degree, classroom based courses was £9,300 (with 5th/95th percentile ranging from £7,900 to £11,700). For laboratory or workshop based courses, the survey found a median charge of £11,500 (with 5th/95th percentile of £8,400 to £14,800).

¹²⁴ Barr (2010a).

¹²⁵ Universities UK 2009/10 International Student Tuition Fees Survey.

Other sources show that the price range at the ends of the price distribution for international students can range from around £6,600 to up to £20,750.¹²⁶ When compared to the funding that English HEIs are able to raise for home and other EU students (in 2009/10 this was in the range of £5,931 to £7,116 for Band A and B subjects¹²⁷), there is potential for a 'wedge' between the prices charged between home and other EU, and international students.

By increasing the amount of funding that HEIs are able to charge for home and other EU students from 2012/13, there is potential for higher prices to be charged, and for greater variation within the higher cap that has been set.

Second, the fee cap may not have been high enough to allow HEIs greater flexibility around how much further they may choose to increase investment per student, for example in attracting world-class academics or developing facilities.

While HEIs have not competed on price for home and other EU students to date, there is price variation between HEIs and different courses for non-EU students at both undergraduate and postgraduate levels.

The unconstrained market for international students in many countries may provide some clues as to how competition affects institutions. Abbott and Doucouliagos (2009) find evidence that competition for fee-paying international students has increased productive efficiency in Australian universities but not in New Zealand universities. The authors suggest one of the reasons for the difference is that Australian universities face more genuine international competition whereas New Zealand universities mostly compete for a subset of international students already within the country.

HEI Response to an Increase in the Fee Cap

The increase in the fee cap may allow price variation so that the choice over the level of fees is related to the desire to bring in additional resources for increased quality or drive greater efficiency to keep prices low. Diversity in the current system also suggests that there would be variation in the funding requirements of different institutions (for example, depending on the facilities that they offer) and for different courses – price signals can then act as an additional tool in the market for customers and providers.

HEIs may also take student behaviour into account in setting their price. As indicated above, there is some evidence to suggest that a price increase will lead to a fall in demand (but this will also interact strongly with the availability of loans, scholarships and other finance offered by both the government and HEIs). However, in the current environment of excess demand, this may not be a considerable constraint on

¹²⁶ See www.publicgoods.co.uk.

¹²⁷ One aspect of how HEFCE teaching funding is allocated is the subject studied. The different bands (A to D) describe different groups of subjects from classroom-based courses (Band D), through to courses with some laboratory or studio elements (Band C), more intensive lab (Band B) and clinical based courses (Band A).

HEIs. The Veblen good effect may also be an influence, with HEIs pricing strategies relating to their ability to signal quality, but experience in the US suggests that this may not lead to price bunching at a high level. However, with increasing prices, HEIs will be under increasing pressure to demonstrate their value to students, particularly if they want to charge a premium price. In addition, UK HEIs are also constrained by the fee cap.

While a fee cap will have a high profile role politically in ensuring support for charging for HE, there is also a role in having a fee cap that provides a cap on any potential monopoly power that may be associated with the networks that some universities have built up. As set out above, students take a wide range of factors into account when choosing their university and course. Barr (2010a) argues that this monopoly power can be seen through the high fees charged at some US universities. This funding is then often ploughed back into improved facilities at the universities, leading to cycles of continuously improved facilities in HE and an inefficiently high level of quality of HE provision. These 'positional' aspects of competition are closely linked to the role of reputation of universities in driving competition between HEIs as well as competition between students, to gain places at those institutions. The value of such competition will be strongest where going to a particular HEI has value later in life.

In addition, HEIs will continue to be able to offer scholarships and bursaries to students, providing another element to competition between HEIs, and may include 'discounts' off the headline fees charged by a university. Currently, there is a minimum bursary of £338 a year available to students who attend English universities charging the maximum tuition fee and who receive the full maintenance grant. In addition, many universities also provide a range of other bursaries, which are a mixture of means-tested and non-means-tested, with the most selective universities tending to offer the higher bursaries.¹²⁸

The Role of Non-Price Competition

While there is an element of price competition in HEIs for some services that they provide, there has been limited price competition for the majority of students – home and other EU undergraduate students – to date. However, HEIs do compete on a number of non-price factors such as: the courses on offer, quality of teaching and research, quality of teaching and learning facilities, reputation, prospects post-graduation, as well as the broader facilities (such as sports facilities and student accommodation).

Quality and reputation are key factors for competition between HEIs, and not just with respect to HE teaching activities, but also research. Excellence in these activities helps to attract high quality staff and students, and all these elements are essential for maintaining a reputation of high quality. While these are important factors, they take time to develop with institutions needing a track record with proven quality that benefits students. As noted above, students are an important input to HEIs, and will

¹²⁸ See OFFA <http://www.offa.org.uk/students/introducing-bursaries/>

be an important factor in attracting other good quality students, as well as academic staff.

HEIs are selective, setting entry grade requirements for their courses. Higher entry grades can act as a signal to students to attract them to their courses and institutions and form part of the nature of competition between HEIs for the best students to attend their courses. In order for an HEI to be able to demand high entry requirements, they need to be able to gain the confidence of prospective students that their course is the one that will best suit their needs – such as delivering high quality teaching and demonstrating good prospects. Reputation plays a role in both being able to attract high quality students, as well as then a ‘constraint’ on who HEIs admit onto their courses in order to maintain their reputation.

There are various measures that HEIs are able to use to demonstrate quality – such as:

- Research performance (for example, as assessed through the Research Excellence Framework);
- Specific research facilities and ‘star researchers’ at the university (for example Nobel prize winners);
- Quality Assurance Assessments (QAA) audit outcomes for HE;¹²⁹
- Destination of graduates;
- Drop-out rates; and,
- Student satisfaction surveys.

HEIs may also use price signals for the provision of uncapped HE (such as on postgraduate courses or for international students) to signal high quality.

Gaining a good reputation and maintaining that reputation is important for being able to attract high quality staff and students and in setting a premium price. HEIs need to be able to communicate their reputation and brand to potential students and academics. The factors above are often used in various information, advice and guidance, for example league tables (produced using various methodologies by various organisations).

Student satisfaction and league tables will focus on a number of different aspects to the student experience, and as such mean that HEIs need to be investing in their reputation at all stages, from initial impressions on prospectuses and open days, to pre-registration processes and engagement, through to experience during the course and graduation. This highlights the need for an HEI to ensure that all aspects of the organisation are supporting the reputation and brand that they have developed –

¹²⁹ <http://www.qaa.ac.uk/> .

right from the way they innovate to deliver the services to the organisational design to support delivery.¹³⁰

There is evidence that non-price competition pressures are effective in contributing to greater efficiency and innovation in HEIs, although funding constraints also play their part. HEIs invest in new technologies to improve the efficiency of operation as well as to provide new and improved services to students. This includes using online technologies to support library and information services, as well as to support distance learning via new modes. The use of online modes of learning is becoming more wide-spread among HEIs (for example with some offering whole degree programmes online). Increasingly this includes embracing online learning technologies which allow students to access learning materials and interact with tutors and other students. In addition, HEIs provide a variety of learning modes to allow distance learning, including outside the UK, as well as fast-track degrees which allow a standard three-year degree to be undertaken over a two year period.

While there is a large degree of product differentiation in the provision of HE, there is a lot of overlap between providers, and students will often have a choice of where they can pursue a subject of study.¹³¹ As HEIs continue to innovate in the way they embrace new technologies and respond to changing needs of students, this will continue to increase the choice available to students.

¹³⁰ NESTA (2009) highlights the range of different areas of investment for innovation and brand.

¹³¹ OFT (2005).

Box 5: Innovation and Efficiency in UK HEIs: JISC

While there has been limited price competition between English universities to date, non-price competition still provides incentives for HEIs to be efficient with their resources in order to free up revenue for investment in other factors, such as quality and teaching and research facilities.

JISC is funded by the funding bodies for HE and FE in the UK and Northern Ireland, and works with colleges and HEIs to support the use of innovative technologies as part of the drive to maintain and drive quality and excellence in learning.

Through its expertise and negotiating power on behalf of HE and FE providers, JISC is able to save millions of pounds every year through procuring online resources, as well as providing an administrative saving by providing that resource centrally. For example, in 2008/09 JISC Advisory Services generated savings equivalent to over £12 for every £1 invested (JISC, 2010).

JISC works with institutions to ensure that technology is supporting their operation and supporting the provision of innovative technologies to provide the infrastructure to provide high quality services to students and researchers. For example, through supporting academic libraries embrace new technology to develop their libraries. In the 1990s, JISC was central to putting resources online, and continues to support librarians in accessing up to date technologies.

JISC has also provided essential support to JANET – a high speed network connecting all universities and colleges across the UK.

In addition to supporting more efficient operation through the use of new technologies, JISC also supports HEIs in using new technologies to provide new learning modes for students. In particular, JISC is supporting the HEFCE online learning taskforce to support HEIs and FECs in bringing in greater use of online learning to provide more flexible modes of learning, to reach new students and maintain competitiveness.

Barriers to entry and regulation

The HE system is currently regulated by four bodies: HEFCE, Quality Assurance Agency (QAA), Office for Fair Access (OFFA) and the Office of the Independent Adjudicator (OIA). Between them these bodies provide important regulatory roles, including protecting student interests, both in terms of fair access and ensuring a minimum quality threshold. There are also important controls in place for protecting public investment, which not only includes ensuring that it is invested appropriately, but also to manage public finance controls. This includes measures around student number controls and access to student support.

While these regulations are important for ensuring a successful HE sector, and have contributed to the high quality reputation of HE in England, they do also create barriers to entry for new providers and expansion for existing providers. For example, it controls which institutions are able to offer a recognised 'English degree' (i.e. degree awarding powers) or call themselves a university.

The role of regulations will continue to be important to ensure confidence in the quality and standards of HE in England. However, with changing funding arrangements and increasing dynamism in HE, ensuring that regulations enable a level playing field across the whole sector and are fit for purpose will be essential for ensuring that barriers to entry are proportionate.

Any changes to regulations that reduce the barriers to entry while maintaining the quality and reputation of the English have the potential to encourage greater competition, both from increasing competition between existing providers and from the potential for new entry.

Conclusion

HEIs do compete with each other in the current system, particularly on non-price factors, but also on price for some groups of students – particularly international and postgraduates. Current competition is providing a constraint on HEIs to be more efficient and innovative, but there is potential that the changes being made will increase competition between HEIs.

Student behaviour is important and provides a constraint on HEIs. Non-price factors are central to the nature of competition and influence student choices, particularly around the courses on offer, the quality of teaching and learning (including the facilities) and reputation. Students are not only customers, but important inputs to the HEI offer. There is evidence that students have reacted to price changes in the past, but this has been off-set by the student support provision from government.

There are a range of policy changes that will have an impact of HEIs, and will influence their behaviour and choices in engaging in the provision of HE, as well as the student response.

References

- Abbott, M. and C. Doucouliagos (2009), 'Competition and efficiency: overseas students and technical efficiency in Australian and New Zealand universities', *Education Economics* vol. 17 (1)
- Abramovsky, L., Harrison, R. and H. Simpson (2007), 'University research and the location of business R&D', *The Economic Journal* vol. 117 (519), pp. C114-C141
- Aghion, P. and P. Howitt (2009), *The Economics of Growth*, MIT Press
- Allender S., Balakrishnan R., Scarborough P., Webster P. and M. Rayner (2009), 'The burden of smoking-related ill health in the UK', *Journal of Tobacco Control* vol. 18, pp.262-267
- Allen, J., Goodlad, S. and C. Redman (2006), 'The market failure of postgraduate education: financial and funding related issues', NPC/Prospects
- Autor, D., Levy, F. and T. Murnane (2003), 'The Skill Content of Recent Technological Change: An Empirical Exploration', *Quarterly Journal of Economics*, 118(4), November 2003, pp.1279-1334
- Bamberger, G. and D. Carlton (2004), 'Antitrust and Higher Education: MIT Financial Aid (1993)', in *The Antitrust Revolution*, J. Kwoka and L. White (eds.), Fourth Edition, Oxford University Press
- Barr, N. (1998), 'Higher Education in Australia and Britain: What Lessons?', *Australian Economic Review* vol. 31 (2), pp. 179-88
- Barr, N. (2000), 'The benefits of education: What we know and what we don't', presented at *HM Treasury Economic Growth and Government Policy* seminar, 12 October 2000, available at: <http://www.hm-treasury.gov.uk/d/252.pdf>
- Barr, N. (2004), *The Economics of the Welfare State*, 4th Edition, Oxford University Press
- Barr, N. (2005), 'Financing Higher Education, IMF Finance and Development' Journal vol. 42 (2), available at: <http://www.imf.org/external/pubs/ft/fandd/2005/06/barr.htm>
- Barr, N. (2010a), 'Paying for Higher Education: What policies, in what order?', Submission to the Independent Review of Higher Education Funding and Student Finance, February 2010
- Barr, N. and N. Shephard (2010), 'Towards Setting Student Numbers Free' [online] available at: http://econ.lse.ac.uk/staff/nb/Barr_Setting_numbers_free_101217.pdf
- Barton, D., Ivanic, R., Appleby, Y., Hodge, R. and K. Tusting (2007), *Literacy, Lives and Learning*, Routledge, London.

Becker, G.S. (1981), *A treatise on the family*. Harvard University Press

Becker, W. and D. Round (2009), 'The Market for Higher Education: Does it Really Exist?', IZA Discussion Paper No. 4092

Bell, D. and D. Blanchflower (2009), 'What Should Be Done About Rising Unemployment in the UK', Stirling Economics Discussion Papers, No. 2009-06

BIS (2009), 'Who is Heading for HE? Young People's Perceptions of, and Decisions About, Higher Education', BIS Research Paper No 3 by Institute for Employment Studies, September 2009

BIS (2010), 'Economic Growth', BIS Economics Paper No. 9

BIS (2010a), 'Interim Impact Assessment of urgent reforms to HE funding and student finance', published 29 November 2010, available at: <http://www.bis.gov.uk/assets/biscore/higher-education/docs/i/10-1309-interim-impact-assessment-he-funding-and-student-finance>

BIS (2010b), 'Motivations and Experiences of UK Students Studying Abroad', BIS Research Paper No. 8

BIS (2010c), 'One Step Beyond: Making the most of postgraduate education', [online] available at: <http://www.bis.gov.uk/assets/BISCore/corporate/docs/p/10-704-one-step-beyond-postgraduate-education>

BIS (2010d), 'Review of Student Support in other countries', BIS Research report No. 10 by London Economics, available at: <http://www.bis.gov.uk/assets/biscore/corporate/docs/r/10-670-review-student-support-in-other-countries.pdf>

BIS (2010e), 'The economic impacts of the UK Research Council system: An overview', available at: <http://www.bis.gov.uk/assets/biscore/science/docs/10-917-economic-impacts-uk-research-council-system.pdf>

BIS (2010f), 'The Impact of the 2006-07 HE Finance Reforms on HE Participation', BIS Research report number 13 available at: <http://www.bis.gov.uk/assets/biscore/corporate/docs/i/10-1189-impact-2006-07-he-finance-reforms-on-participation>

BIS (2010g), 'The role of finance in decision making of Higher Education applicants and students', BIS Research Paper No. 9 available at: <http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/b/bis-rp-009.pdf>

BIS (2011), 'STEM graduates in non-STEM jobs', BIS Research Paper No. 30

BIS/CLG (2010), 'Understanding Local Growth', Economics Paper No. 7

BIS/SLC (2010), 'Early Statistics on Student Support for Higher Education in England 2009/10 at 28 February 2010 (Provisional)', available at:
http://www.slc.co.uk/statistics/facts_figures.html

Blanden, J. (2009), 'How Much Can We Learn from International Comparisons of Intergenerational Mobility?', CEP Paper No. CEEDP0111, available at:
<http://cee.lse.ac.uk/cee%20dps/ceedp111.pdf>

Blanden, J., and S. Machin (2007), 'Recent Changes in Intergenerational Mobility in Britain', report for the Sutton Trust, December 2007, available at:
<http://www.suttontrust.com/research/recent-changes-in-intergenerational-mobility-in-britain/>

Blanden, J. and P. Gregg (2004), 'Family Income and Educational Attainment: A Review of Approaches and Evidence for Great Britain', CMPO: Bristol, 04/101

Blanden, J., Gregg P., and L. Macmillan (2010), 'Intergenerational Persistence in Income and Social Class: The Impact of Within-Group Inequality', CMPO Working Paper 10/230, available at:
<http://www.bristol.ac.uk/cmppo/publications/papers/2010/wp230.pdf>

Blinder, A. (2007), 'How Many US Jobs Might Be Offshorable?', CEPS Working Paper No. 142

Bolin, K., Jacobson, L. and B. Lindgren (2002), 'The demand for health and health investments in Sweden', In B. Lindgren (ed.) *Individual Decisions for Health*, Routledge, London

Bond, R. and L. Paterson (2005), 'Coming down from the ivory tower? Academics' civic and economic engagement with the community', *Oxford Review of Education* vol. 31 (3), pp. 331–351

Breen, R., and J. H. Goldthorpe (1997), 'Explaining Educational Differentials: Towards a Formal Rational Action Theory', *Rationality and Society*, 9.3, 275-305

Breen, R. (ed.) (2004), *Social Mobility in Europe*, Oxford: Oxford University Press

Brennan, J., King, R. and Y. Lebeau, (2004), 'The role of universities in the transformation of society', Centre for Higher Education Research and Information/Association of Commonwealth Universities

Breton, T. R. (2010), 'Schooling and national income: How large are the externalities?', *Education Economics* vol. 18(1), pp.67-92

Brewer, M., Muriel, A., Phillips, D., and L. Sibietta (2008), 'Poverty and Inequality in the UK: 2008', IFS: IFS Commentary No. 105

British Council (2006), 'Tracking the college and university experience in Scotland: what do international students think?', Report for British Council Scotland by i-

graduate, available at : <http://www.britishcouncil.org/scotland-international-student-experience.pdf>

Broecke, S. and J. Hamed, (2008), 'Gender Gaps in Higher Education Participation: An Analysis of the Relationship Between Prior Attainment and Young Participation by Gender Socio-Economic Class and Ethnicity', BIS, 2008

Browne Review (2010), 'The Independent Review of Higher Education Funding and Student Finance', available at: <http://hereview.independent.gov.uk/hereview/>

Bukodi, E. and J. H. Goldthorpe (2009), 'Class origins, education and occupational attainment: cross-cohort changes among men in Britain', CLS Working Paper 2009/3

Bynner, J. and M. Egerton (2001), 'The Wider Benefits of HE', report by the Institute of Education for the Higher Education Funding Council in England (HEFCE) and the Smith Institute, HEFCE report 01/46

Bynner, J., Dolton, P., Feinstein, L., Makepeace, G., Malmberg, L. and L. Woods (2003), 'Revisiting the benefits of higher education', Report by the Bedford Group for Lifecourse and Statistical Studies, Institute of Education

Callender, C. and D. Wilkinson (2010), 'Futuretrack Part-time Students: Their use of careers information, advice and guidance', available at: http://www.hecsu.ac.uk/assets/assets/documents/FTPT_Career_plans_and_IAG_07-05-2010.pdf

Callender, C. (2003) 'Student Financial Support in Higher Education: Access and Exclusion', in M. Tight (ed.) *Access and Exclusion: International Perspectives on Higher Education Research*, Elsevier Science, London.

Callender, C. and J. Jackson (2005), 'Does the Fear of Debt Deter Students from Higher Education?', *Journal of Social Policy*, 34, 4, 509-540.

Canton, E. and A. Blom (2004), 'Can student loans improve accessibility to higher education and student performance? An impact study of the case of SOFES, Mexico,' World Bank Policy Research Working Paper No. 3425

Carlino, G. and R. Hunt (2009), 'What explains the quantity and quality of local inventive activity?', Federal Reserve Bank of Philadelphia Research Department Working Paper, No. 09-12

Carneiro, P. and J. Heckman (2002), 'The Evidence on Credit Constraints on Post-Secondary Schooling', *Royal Economic Society*, 112(482), pp 705-734

Carpenter, H. (2006) 'Repeat Jobseeker's Allowance spells', DWP Research Report 394

CBI/EDI (2010), 'Education and Skills Survey 2010 – Ready to grow: business priorities for education and skills', available at: www.cbi.org.uk/.../2010-cbi-edi-ready-to-grow-business-priorities-for%20education-and-skills.pdf

- CBI/EDI (2011), 'Building for growth: business priorities for education and skills', available at: <http://www.cbi.org.uk/pdf/20110509-building-for-growth.pdf>
- Centre for Research on the Wider Benefits of Learning (2006), 'A synthesis of findings from the CRWBL 1999-2006', Brief no. RCB05-06
- CEP/McKinsey (2007), 'Management practice & productivity: why they matter'
- Chatterji, M. (1998), 'Tertiary education and economic growth', *Regional Studies*, 32, pp. 349-354
- Chowdry, H., Crawford, C., Dearden, L., Goodman, A. and A. Vignoles, (2009), 'Widening Participation in Higher Education: Analysis using Linked Administrative Data', IFS Working Paper W10/04
- Ciccone, A. and E. Papaioannou (2007), 'Human capital, the structure of production and growth', European Central Bank Working Paper Series No. 623
- Connor, H., Dewson, S., Tyers, C., Eccles, J., Regan, J. and J. Aston (2001), 'Social class and higher education issues affecting decisions on participation by lower social class groups', DfEE Research Report RR267
- Cowling, M. (2009), 'The geographical distribution of UK talent: causes and consequences', ESRC Impact Discussion Paper, Institute for Employment Studies
- Crawford, C., Johnson, P., Machin, S. and A. Vignoles (2011), 'Social Mobility: A Literature Review', BIS
- Currie, J. and E. Moretti (2003), 'Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings', *Quarterly Journal of Economics* vol. 118 (4), pp. 1495-1532
- Cutler, D.M. and A. Lleras-Muney (2006), 'Education and Health: Evaluating Theories and Evidence', NBER Working Paper 12352
- d'Addio, A. C., (2007), 'Intergenerational Transmission of Disadvantage: Mobility or Immobility Across Generations?', *OECD Social, Employment and Migration Working Papers*, No. 52, OECD Publishing
- Davies, P., Slack, K., Hughes, A., Mangan, J, and K. Vigurs (2008), 'Knowing Where to Study? Fees, Bursaries and Fair Access', Research conducted for Sutton Trust, February 2008
- Department for Children, Schools and Families (2009), 'Deprivation and Education: the evidence on pupils in England, Foundation Stage to Key Stage 4'
- de Walque, D. (2004) 'Education, Information, and Smoking Decisions: Evidence from Smoking Histories, 1940-2000', World Bank Policy Research, Working Paper 3362

- Dearden, L. (1999), 'Qualifications and Earnings in Britain: How Reliable are Conventional OLS Estimates of the Returns to Education?', IFS WP99/7
- Dearden, L., McGranahan, L. and B. Sianesi (2004), 'Returns to Education for the 'Marginal Learner': Evidence from the BCS70', Centre for the Economics of Education Discussion Paper 45
- Dearden, L., Fitzsimons, E. and G. Wyness (2010), 'The Impact of Higher Education Finance on University Participation in the UK', BIS Research Paper 11
- Dee, T. (2004), 'Are there civic returns to education?', *Journal of Public Economics* vol. 88 (9-10), pp.1697-1720
- DellaVigna, S. (2009), 'Psychology and Economics: Evidence from the Field', *Journal of Economic Literature* vol. 47 (2), pp. 315-372
- Del-Rey, E. and B. Verheyden (2008), 'Loans, insurance and failures in the credit market for students', Barcelona Economics Working Paper Series, Working Paper No. 359
- Dench, S and J. Regan (2000), 'Learning in Later Life: Motivation and Impact', Department for Education and Employment, Research Report RR183,
- Department for Education and Skills (2005), 'End to End Review of Careers Education and Guidance within the Connexions service', July 2005
- Department for Education and Skills (2007), 'Employer and University Engagement in the Use and Development of Graduate Level Skills', by Institute for Employment Research, University of Warwick, DfES research report RR835B
- Dickerson, A. (2005), 'A study on rates of return to investment in level 3 and higher qualifications', by Institute for Employment Research, University of Warwick, available at: <http://www.bis.gov.uk/files/file19870.pdf>
- Donegan, M., Drucker, J., Goldstein, H., Lowe, N. and E. Malizia, (2008), 'Which indicators explain metropolitan economic performance best?', *Journal of the American Planning Association* vol. 74 (2), pp.180-195
- Elias, P. and K. Purcell (2004), 'Seven Years On: Graduate Careers in a
Elias, P. and K. Purcell (2009), 'Occupational change and the expansion of higher education in the UK: the impact on graduate earnings' at DECOWE: Development of Competencies in the World of Work and Education, University of Ljubljana, Slovenia, 24-26 September 2009
- Emmerson, C., Frayne, C., McNally, S. and O. Silva (2006), 'Aimhigher: Excellence Challenge: a policy evaluation using the Labour Force Survey', DfES RR813
- Erikson, R. and J. H. Goldthorpe (1992), *The Constant Flux: A Study of Class Mobility in Industrial Societies*, Oxford: Clarendon Press

- Ermisch, J. (1999) 'Family Matters', DP 1591, CEPR, Institute for Social and Economic Research, University of Essex
- Ermisch, J. and E. Del Bono, (2010), 'Education Mobility in England: The link between the education levels of parents and the educational outcomes of teenagers', A Report for the Sutton Trust, April 2010
- Ermisch, J. and M. Francesconi (2000), 'Educational Choice, Families and Young People's Earnings' *Journal of Human Resources* vol. 35 (1), pp. 143-176.
- ESRC (2006), 'Higher education's effects on disadvantaged groups and communities', available at: <http://www.open.ac.uk/cheri/documents/esrc-crossregional-final-report.pdf>
- European Commission (2010), 'The Erasmus programme 2008/09 – A statistical overview', Director General for Education and Culture
- EURYDICE (1999), 'Key topics in education', Technical report, European Commission, Brussels
- Faggian, A. (2010), 'The effect of variable tuition fees on higher education participation in Northern Ireland: an interim report', Department for Education and Learning, Northern Ireland
- Feinstein, L. (2002), 'Quantitative estimates of the social benefits of learning 1: Crime', Centre for Research on the Wider Benefits of Learning Research Report 5, Institute of Education, University of London
- Feinstein, L. (2003), 'Inequality in the early cognitive development of British children in the 1970 Cohort', *Economica*, 70(277):73-97
- Feinstein, L. (2002), 'Quantitative Estimates of the social benefits of learning, 2: health (depression and obesity)', Centre for Research on the Wider Benefits of Learning, Research Report 6.
- Feinstein, L. and K. Duckworth (2006), 'Are there effects of mothers' post-16 education on the next generation? Effects on children's development and mothers' parenting', Wider Benefits of Learning Research Report 19, Institute of Education, University of London
- Feinstein, L and C. Hammond (2004), 'The Contribution of Adult Learning to Health and Social Capital', Centre for Research on the Wider Benefits of Learning, Research Report No. 8
- Feinstein, L. and R. Sabates (2005), 'Education and youth crime: effects of introducing the Educational Maintenance Allowance programme', Wider Benefits of Learning Research Report 14, Institute of Education, University of London

Feinstein, L., Anderson, T., Hammond, C., Jamieson, A. and A. Woodley (2007), 'The Social and Economic Benefits of Part-time, Mature Study at Birkbeck College and the Open University', Birkbeck University of London and The Open University

Felstead, A., Green, F., Gallie, D. and Y. Zhou (2007), 'Skills at Work 1986 to 2006', ESRC Centre on Skills, Knowledge and Organisational Performance

Florida, R. (1999), 'The role of the university: leveraging talent, not technology', *Issues in Science and Technology* vol. 15 (4), pp. 67-73

Florida, R., Gates, G., Knudsen, B. and K. Stolarick (2006), 'The university and the creative economy', Creative Class, available at: http://creativeclass.com/rfcgdb/articles/University_andthe_Creative_Economy.pdf

Futuretrack (2006), survey results available at: <http://www.futuretrack.ac.uk/public/2006entrants.php>

Galindo-Rueda, F. and J. Haskel (2005), 'Skills, workforce characteristics and firm-level productivity', Report prepared for the Department of Trade and Industry, available at: <http://www.bis.gov.uk/files/file11000.pdf>

Gayle, V., Berridge, D. and R. B. Davies (2002), 'Econometric Modelling of Demand for HE', DfEE Research Report RR472

Gemmell, N. (1996), 'Evaluating the impact of human capital stocks and accumulation on economic growth: some new evidence', *Oxford Bulletin of Economics and Statistics*, 58, 9-28

Gereffi, G., Wadhwa, V., Rissing, B. and R. Ong (2008), 'Getting the numbers right: international engineering education in the United States, China and India', *Journal of Engineering Education* vol. 97 (1), pp. 13-25

Gibbons, S., Overman, H., and P. Pelkonen (2010), 'Wage disparities in Britain: people or place?', SERC Discussion Paper 60

Glennerster, H. (1991), 'Quasi-Markets for Education?', *The Economic Journal* vol. 101, issue 408, pp. 1268-1276

Goldthorpe, J. H. and C. Mills (2008), 'Trends in intergenerational class mobility in Britain in the late twentieth century', in Breen, R. (ed.) *Social Mobility in Europe*, Oxford: Oxford University Press

Goldthorpe, J. H. and M. Jackson (2007), 'Intergenerational Class mobility in contemporary Britain: Political concerns and empirical findings', *British Journal of Sociology*, 58:526-546

Goos, M. and A. Manning (2003), 'Lovely and Lousy Jobs: The Rising Polarization of Work in Britain', CEP Discussion Papers, No. 0604

- Gorard, S. and E. Smith (2006), 'Review of widening participation research: addressing the barriers to participation in Higher Education', Report for HEFCE by the University of York, Higher Education Academy and Institute for Access Studies, HEFCE research report 2004/34
- Green, F. and Y. Zhu (2010), 'Overqualification, job dissatisfaction, and increasing dispersions in the returns to graduate education', *Oxford Economic Papers*, vol. 62(4), pp.740-763
- Groot, W. and M. Maassen van den Brink (2006), 'What does education do to our health?', in OECD (2006)
- Grossman, M. (1975), 'The correlation between health and schooling', in N. E. Terleckyj, (ed.), *Household Production and Consumption*. New York: Columbia University Press, pp. 147-311
- Grossman, M. (2006), 'Education and non-market outcomes', in E. Hanushek and F. Welch, eds., *Handbook of the Economics of Education*. Amsterdam: North Holland, pp. 576-633
- Guellec, D. and B. Van Pottelsberghe De La Potterie (2004), 'From R&D to productivity growth: Do the institutional settings and the source of funds of R&D matter?', *Oxford Bulletin of Economics and Statistics* vol. 66(3), pp.353-378
- Hanushek, E. and L. Woessmann (2008) 'The role of cognitive skills in economic development', *Journal of Economic Literature*, 46:3, pp.607-688
- Hanushek, E. and L. Woessmann (2010), 'The high cost of low educational performance: The long-run economic impact of improving PISA outcomes', OECD
- Harkness, S. and S. Machin (1999), 'Graduate Earnings In Britain, 1974-95', Department for Education and Employment, Research Report RR95
- Haveman, R. and B. Wolfe (1995), 'The Determinants of Children's Attainments: A Review of Methods and Findings', *Journal of Economic Literature*, 33:4, 1829-1878
- Haveman, R. and B. Wolfe (2001), 'Accounting for the social and non-market benefits of education', OECD, available at: <http://www.oecd.org/dataoecd/5/19/1825109.pdf>
- Haveman, R., and B. Wolfe (1984), 'Schooling and Economic Well-Being: The Role of Non-Market Effects', *Journal of Human Resources* 19(3) pp. 377-407
- Heath, A. and C. Payne (1999), 'Twentieth Century Trends in Social Mobility in Britain', CREST, Working Paper 70
- HEFCE (2003), 'Consultation by the UK funding bodies on the review by Sir Gareth Roberts', May 2003/22
- HEFCE (2008), 'Counting what is measured or measuring what counts? League tables and their impact on higher education institutions in England', Report to HEFCE

by the Centre for Higher Education Research and Information (CHERI), Open University, and Hobsons Research. Issues Paper 2008/14.

HEFCE (2009), 'Evaluation of the effectiveness and role of HEFCE/OSI third stream funding', Report to HEFCE by PACEC and the Centre for Business Research, University of Cambridge. Issues Paper 2009/15.

HEFCE (2010), 'Trends in Young Participation for England', HEFCE 2010/03

HEFCE (2010a), 'Strategically Important and Vulnerable Subjects: The HEFCE Advisory Group's 2009 Report', March 2010/09

HEFCE (2010b), 'Guide to Funding: How HEFCE allocates its funds', September 2010/24

HEFCE (2010c), 'Understanding the information needs of users of public information about higher education', Report to HEFCE by Oakleigh Consulting and Staffordshire University, August 2010

HEFCE (2010d), 'Enhancing and Developing the National Student Survey', Report to HEFCE by the Centre for Higher Education Studies at the Institute of Education, August 2010

Higher Education Academy (2006), 'Changing Fee Regimes and their Impact on Student Attitudes to Higher Education', Report of a Higher Education Academy Funded Research Project 2005-2006

Higher Education Academy (2008), 'Widening participation to postgraduate study; Decisions, deterrents and creating success'

Higher Education Policy Institute (2007), 'The economic costs and benefits of international students', HEPI July 2007

Higher Education Policy Institute (2011), 'Private Providers in UK Higher Education: Some Policy Options', HEPI May 2011

Higher Education Policy Institute and the British Library (2010), 'Postgraduate education in the United Kingdom', Ginevra House, January 2010, available at: http://www.bl.uk/aboutus/acrossuk/highered/helibs/postgraduate_education.pdf

Higher Education Statistics Agency (2011), 'Students and qualifiers at UK HE institutions', Online: accessed May 2011

Higher Education Statistics Agency (2011a), 'Survey of private and for-profit providers of Higher Education in the UK 2009/10 - Provisional figures' Press Release 159 available at: http://www.hesa.ac.uk/index.php?option=com_content&task=view&id=2086&Itemid=310

HM Government (2011), 'Opening Doors, Breaking Barriers: A Strategy for Social Mobility', April 2011

i-Graduate (2010), 'Measuring the effect of the Prime Minister's Initiative on the International Student Experience in the UK', available at: http://www.britishcouncil.org/pmi-isb_2010_report.pdf

IMF (2007), 'The Globalization of Labor', World Economic Outlook 2007

Institute for Employment Studies (1999), 'Making the right choice', a report to the Committee of Vice-Chancellors and Principals, HEFCE and UCAS

Institute for Fiscal Studies (2010), 'The impact of the 2006-07 package of reforms to HE funding', Submission to the 2010 fees review 19th January 2010

Jenkins, A., Greenwood, C. and A. Vignoles (2007), 'The returns to qualifications in England: updating the evidence base on level 2 and level 3 vocational qualifications', Centre for the Economics of Education Discussion Paper

JISC (2010), 'JISC, making it possible...', April 2010

Johnson, R.C. (2010), 'The Health Returns of Education Policies from Preschool to High School and Beyond', *American Economic Review: Papers & Proceedings* vol. 100 (2), pp.188–194

Junankar, P.N. and J. Liu (2003), 'Estimating the social rate of return to education for Indigenous Australian', *Education Economics* vol. 11 (2), pp. 169-192

Keller, K. (2006), 'Investment in primary, secondary and higher education and the effects on economic growth', *Contemporary Economic Policy*, 34(1), pp. 18-34

Kemp, P., Bradshaw, J., Dornan, P., Finch, N. and E. Mayhew (2004), *Routes Out of Poverty: A Research Review*, Joseph Rowntree Foundation

Kenkel, D.S. (1991), 'Health behaviour, health knowledge and schooling', *Journal of Political Economy* vol. 99 (2), pp. 287-305

Krugman, P. (1991), 'Increasing Returns and Economic Geography', *The Journal of Political Economy* 99 (3), pp. 483-499

La Valle, I. and M. Blake (2001), 'National Adult Learning Survey (NALS), 2001', National Centre for Social Research. DfES Research Report RR231

Lange, F. and R. Topel (2006), 'The Social Value of Education and Human Capital', in Hanushek, E. and F. Welch, (eds.), *Handbook of the Economics of Education*, Amsterdam: North Holland, pp. 459-510

Lexmond, J. and R. Reeves (2009), 'Building Character', DEMOS

- Lillard, D. (1993), 'Neighbourhood effects on educational attainment', CEH Working Paper RP93-5, Cornell University
- Lleras-Muney, A. (2005), 'The relationship between education and adult mortality in the United States', *Review of Economic Studies* 72, pp. 189-221
- Lochner, L. and E. Moretti (2004), 'The effect of education on crime: Evidence from prison inmates, arrests and self-reports', *American Economic Review* vol. 94(1), pp. 155-189
- London Economics (2011), 'The Returns to Higher Education Qualifications', BIS Research Paper No. 45
- LSC (2009), 'Benefits of Completing an Apprenticeship', Learning and Skills Council
- Machin, S. and A. Vignoles (2005), *What's the good in education? The economics of education in the UK*, Princeton University Press, Oxford
- McIntosh, S. and R. Garrett, (2009), 'The Economic Value of Intermediate Vocational Education and Qualifications', UKCES Evidence Report 11
- McKinsey (2005), 'The Emerging Global Labour Market', McKinsey Global Institute
- McKnight, A. (2000), 'Trends in earnings inequality and earnings mobility, 1977-1997: the impact of mobility on long-term inequality', DTI: Employment Relations Research Series No. 8
- McMahon, W.W. (1998), 'Conceptual framework for the analysis of the social benefits of lifelong learning', *Education Economics* vol. 6 (3), pp.309-346
- McMahon, W.W. (1999), *Education and development, Measuring the social benefits*, Oxford University Press, Oxford
- McMahon, W.W. (2009), *Higher Learning, Greater Good, the private and social benefits of higher education*, John Hopkins University Press, Baltimore
- Meghir, C. and M. Palme (2005), 'Educational Reform, Ability and Family Background', *American Economic Review*, 95.1, 414-424
- Moretti, E. (2004), 'Estimating the social return to higher education: evidence from longitudinal and repeated cross-sectional data', *Journal of Econometrics* vol. 121 (1-2), pp. 175-212
- Morris, M. and S. Rutt (2006), 'Evaluation of Aimhigher:Excellence Challenge Longitudinal Pupil Analysis', DfES RR814
- Morris, M., Rutt, S. and P. Mehta (2009), 'The longer term impact of Aimhigher: tracking individuals', NFER

Mosca, I. and R. Wright (2010), 'National and international graduate flows, Impact of higher education institutions on regional economies', ESRC Impact of Higher Education Institutions on Regional Economies: A Joint Research Initiative

Nelson, R. and E. Phelps (1966), 'Investment in humans, technical diffusion, and economic growth', *American Economic Review*, March 1966, 56(1/2), pp. 69-75

NESTA (2009), 'The Innovation Index: Measuring the UK's Investment in Innovation and its Effects', Index Report: November 2009

New Economics Foundation (2011), 'Degrees of value: how universities benefit society'

Nunn, A., Johnson, S., Munro, S., Bickerstaffe, T. and S. Kelsey (2007), 'Factors influencing social mobility', Department for Work and Pensions, RR450

O'Leary, N. and P. Sloane (2005), 'The Return to a University Education in Britain', *National Institute Economic Review*, 2005, 193:75

OFFA (2010), 'What more can be done to widen access at selective universities?', Report from Sir Martin Harris Director of Fair Access, April 2010, available at: <http://www.offa.org.uk/wp-content/uploads/2010/05/Sir-Martin-Harris-Fair-Access-report-web-version.pdf>

Office of Fair Trading (2004), 'Market Definition: Understanding Competition Law', Competition Law 2004

Office of Fair Trading (2005), 'Merger decision: Completed acquisition by the University of Manchester of the Victoria University of Manchester and the University of Manchester Institute of Science and Technology'

Office of Fair Trading (2010), 'What does Behavioural Economics mean for Competition Policy?', OFT report 1224 March 2010

Organisation for Economic Cooperation and Development (2006), 'Measuring the effects of education on health and civic engagement: Proceedings of the Copenhagen symposium', available at <http://www.oecd.org/dataoecd/23/61/37437718.pdf>

Organisation for Economic Cooperation and Development (2008), 'Education at a Glance', OECD, Paris

Organisation for Economic Cooperation and Development (2010a), 'Education at a Glance', OECD, Paris

Organisation for Economic Cooperation and Development (2010b), 'Skills for research and innovation', OECD, Paris

Purcell, K., Elias, P. and G. Atfield (2009), 'Analysing the relationship between higher education participation and educational and career development patterns and

outcomes; A new classification of higher education institutions', A report for the Higher Education Career Services Unit by the Institute for Employment Research, University of Warwick

Purcell, K., Elias, P., Ellison, R., Atfield, G., Adam, D. and I. Livanos (2008), 'Applying for Higher Education – the diversity of career choices, plans and expectations', Findings from the First Futuretrack Survey of the 'Class of 2006' applicants for Higher Education. Higher Education Career Services Unit, Universities and Colleges Admissions Service and Institute of Employment Research

Purcell, K., Elias, P., Davies, R. and N. Wilton (2005), 'The Class of '99: A study of early labour market experiences of recent graduates', DfES

Putnam, R. (2000), *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster

Research Councils UK (2010), 'Research Councils UK Doctoral Fee and Stipend Levels for 2011/12', Letter, 11 November 2010

Rolfe, H. (2001), 'The effect of tuition fees on students' demand and expectations: evidence from case studies of four universities', NIESR Discussion Paper No. 190, December 2001

Saunders, P. (2010), *Social Mobility Myths*, Civitas

Science and Technology Policy Research Unit (SPRU) (2000), 'Talent, not technology: publicly funded research and innovation in the UK', Report for the Committee of Vice-Chancellors and Principals and HEFCE

Shen, H. and A. Ziderman (2007), 'Student loans repayment and recovery – international comparisons', Paper presented at the FHE-2007 conference in Portoro

Sianesi, B. and J. Van Reenen (2003), 'The returns to education: macroeconomics', *Journal of Economic Surveys* vol. 17 (2), pp. 157-200

Sinclair, E. and H. Connor (2008), 'University admissions and vocational qualifications: 2 years on', Action on Access

Southampton Solent University (2005), 'Code of Corporate Governance and Governors Handbook, 2(ii) Introduction to the Legal Framework and Corporate Governance of Higher Education'

Steelman, A. (2005) What drives wage inequality? *Economic quarterly*, Federal Reserve Bank of Richmond <http://www.allbusiness.com/north-america/united-states-virginia/1058405-1.html>

Stuart, M., Lido, C., Morgan, S., Solomon, L. and K. Akroyd (2008), 'Widening participation to postgraduate study: Decisions, deterrents and creating success', HE Academy

Sutton Trust (2010), 'The Mobility Manifesto: A report on cost effective ways to achieve greater social mobility through education, based on work by the Boston Consulting Group', March 2010, available at:

<http://www.suttontrust.com/research/the-mobility-manifesto/>

Sutton Trust/BIS (2009), 'Applications, Offers and Admissions to Research Led Universities'

Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I. and B. Taggart (2004), 'The Effective Provision of Pre-School Education (EPPE) Project: Final Report', Department for Education and Skills and the Institute of Education

Tett, L and K. Maclachlan (2007), 'Adult Literacy and Numeracy, Social Capital, Learner Identities and Self Confidence', *Studies in the Education of Adults*, 39, 2 pp150-167

The National Postgraduate Committee (2006), 'The market failure of postgraduate education: Financial and funding related issues', [online] available at:

<http://www.npc.org.uk/postgraduatefactsandissues/postgraduatepublications/marketfailureofpostgraduateeducationssurveyreport2006.pdf>

The Panel on Fair Access to the Professions (2009), 'Unleashing aspiration. Summary and recommendations of the full report', available at

<http://www.agcas.org.uk/assets/download?file=1204&parent=465>

UCAS (2010a), 'Provisional End of Cycle Report 2009/10', Online Edition available at: <http://www.ucas.ac.uk/documents/mediareleases/endofyearreport.pdf>

UCAS (2010b), 'UCAS Tariff Tables', accessed April 2011, available at:

http://www.ucas.ac.uk/students/ucas_tariff/tarifftables/

UK Commission for Employment and Skills (2008), 'Working Futures 2007-2017', UKCES Evidence Report 2, December 2008

UK Commission for Employment and Skills (2009), 'Ambition 2020: World Class Skills and Jobs for the UK, The 2009 Report'

UK Commission for Employment and Skills (2010a), 'National Employer Skills Survey for England 2009', UKCES Main Report, conducted by IFF Research

UK Commission for Employment and Skills (2010b), 'Skills for Jobs: Today and Tomorrow. The National Strategic Skills Audit for England 2010', UKCES March 2010

Universities UK (2008), 'Variable tuition fees in England: assessing their impact on students and higher education institutions. A third report', UUK research report, July 2008.

Universities UK (2009), 'Survey of Tuition Fees for International Students, 2009/10', UUK, April 2009

Universities UK (2009a), 'The impact of universities on the UK economy', UUK research report, November 2009

Universities UK (2010), 'The growth of private and for-profit higher education providers in the UK', UUK research report, March 2010

Usher, A., (2005), 'A Little Knowledge is a Dangerous Thing: How Perceptions of Costs and Benefits Affect Access to Education', Educational Policy Institute, Toronto

Venables, A. (2005), 'New Economic Geography', in Palgrave Dictionary of Economics

Vignoles, A., Machin, S. and F. Galindo-Rueda (2003) 'Sectoral and area analysis of the economic effects of qualifications and basic skills', DfES Research Report

Weale, M. (1993), 'A critical evaluation of rate of return analysis', *The Economic Journal* vol. 103, issue 418, pp. 729-37

Winston, G. (1999), 'Subsidies, Hierarchy and Peers: The Awkward Economics of Higher Education', *Journal of Economic Perspectives* 13 (1) pp. 13-36

Woodhall, M. (2004), 'Student Loans: Potential, Problems, and Lessons from International Experience', *JHEA/RESA* vol. 2 (2), pp. 37-51

Woodhall, M. (Ed) (2002), 'Paying for Learning: The Debate on Student Fees, Grants and Loans in International Perspective', *The Welsh Journal of Education* vol. 11(1)

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