

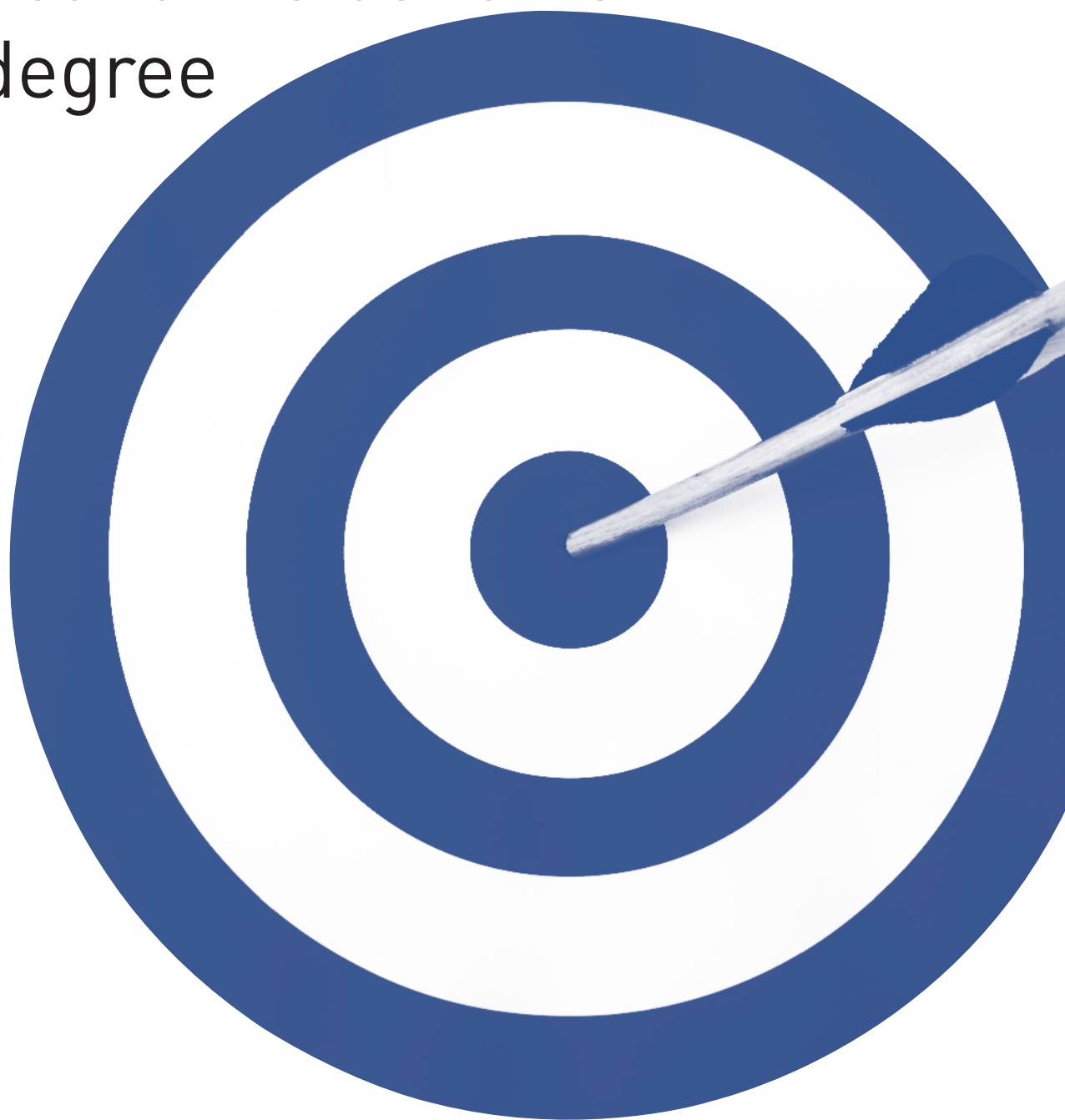


Universities UK

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Research Report

The economic benefits
of a degree



Research Reports

This new series of Research Reports published by Universities UK will present the results of research we have commissioned in support of our policy development function. The series aims to disseminate project results in an accessible form and there will normally be a discussion of policy options arising from the work.

The introduction of tuition fees of up to £3,000 a year for full-time undergraduates in England in 2006 has revitalised the debate about the benefits of a degree to the individual. As a contribution to this discussion Universities UK commissioned PricewaterhouseCoopers (in association with London Economics,) to produce a report on the benefits of a degree drawing on recent research including its own.

The findings confirm that there are significant economic benefits (as well as substantial non-financial advantages) to obtaining a degree and these amount to an additional £160,000 over a working lifetime compared with an individual with two or more A-levels. This represents a difference of up to 25% between the two groups. There will be additional financial benefits from the possession of postgraduate qualifications. At the same time the report recognises that these figures will vary according to degree subject, qualification type and age of attaining the qualification. The financial benefits also vary according to socio-economic background: men from lower socio-economic groupings and families with relatively lower family income do particularly well from attaining higher education qualifications.

The report also covers the financial benefit to the taxpayer of university education. This is a calculation based on the costs and benefits to the State of providing higher education. The latter include substantial tax benefits accruing to the Exchequer, particularly later in a graduate's working life, as earnings and related taxation payments increase.

Another important conclusion of the research – despite much speculation to the contrary – is the fact that there has been no erosion of the financial benefit of a degree even though there has been a substantial increase in the supply of graduates over the last 15 years. There has been a matching increase in demand in the economy for highly trained individuals. In Britain's knowledge-based economy there is every prospect that this demand will continue to grow in the future, a conclusion also reinforced by the OECD's report *Education at a Glance 2006*. The report also challenges the view that the recent increase in student fees in England reduces the financial benefit of a degree to the individual. In fact the report shows that the opposite is true. The reason is that the increased public subsidies associated with student loans more than offset the deferred cost of larger loan repayments made many years after graduation.

The message from this report is clear: taking a degree remains an attractive personal investment that will produce significant long-term financial gains and many other benefits for the individual graduate.

Professor Drummond Bone
President, Universities UK

2. Executive summary

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One of the dominant contributory factors to a country's long-run productivity and economic growth is the education, training and skills possessed by its working-age population. Higher education qualifications are one of the key mechanisms in generating wealth for the students who attain them. The provision of education and skills also produces good rates of return to the State.

This report highlights the economic benefits associated with higher education qualification attainment and how these benefits can vary according to the subject of study, gender and prior qualification attainment. It also considers the costs and benefits of higher education for the individual and the State.

Key findings

- Over a working life, the representative individual with an undergraduate qualification will earn between 20% and 25% more than his or her equivalent holding two or more A-levels: the so-called 'graduate premium'.
- Combining income and employment effects, the gross additional lifetime earnings (in today's money terms) of a representative undergraduate degree¹ over and above two or more A-levels is approximately £160,000.
- The returns to higher education qualifications have remained relatively stable throughout the period of mass expansion of higher education from the late 1980s. There has been no erosion of the graduate premium as the supply of graduates has increased.
- The economic return to higher education qualifications depends on the subject studied, the level of qualification possessed by students on entry, the level and the type of qualification attained.
- There is currently wide variation in the gross additional lifetime earnings of different degree subjects. For example, the lifetime earnings premium is £340,000 for medicine and dentistry qualifications compared with £51,549 for the humanities and £34,949 for the arts.
- Higher education qualifications do not just affect earnings. Individuals in possession of higher education qualifications are more likely to be employed compared to those with the next highest level of qualification. They are also more likely to return to employment following periods in unemployment or economic inactivity.
- The financial benefit of completing a degree is greatest for men from lower socio-economic groups or from families with lower levels of income. Family resources and socio-economic grouping play less of a role in determining the economic returns to higher education for women.
- The earnings premium attributable to higher education qualifications increases with time. The benefits to individuals from possession of higher education qualifications increase as they get older.
- The average gross additional lifetime earnings benefit associated with a postgraduate degree is approximately £70,000-£80,000; £30,000-£40,000 for a postgraduate certificate; £35,000-£45,000 for a HNC/HND; and £5,000-£15,000 for a diploma in higher education.
- The average rate of return associated with a representative undergraduate degree prior to the introduction of variable fees in England was approximately 12.1% per annum. Following the introduction of variable fees and the changes to the student finance package the rate of return to the representative individual has been estimated to increase to 13.2%.
- The equivalent rate of return to the Exchequer was also estimated to be approximately 12.1% before the introduction of variable fees. With the changes to fees and student finance reforms, this falls to 11%, as there has been a resource transfer from the Exchequer to the individual.
- In nominal terms, the increased benefits associated with grants and subsidies broadly equate with the increase in graduate repayments in the future. However, the fact that these increased repayments generally take place many years into the future while the benefits have an impact now leave the representative student better off than was previously the case.

Human capital can be defined as the stock of knowledge and skills embodied in an individual as a result of education, training, and experience that makes them more productive in the economic sense. The accumulation of human capital in the form of education, skills and training is one of the core determinants of long run economic growth².

Higher education institutions in the United Kingdom generate human capital through:

- the provision of education and training to students;
- research and development activities; and
- the generation and dissemination of knowledge through academic and business networks.

This report outlines some of the recent and relevant evidence relating to the economic benefits associated with higher education qualification attainment in the UK.

When measuring the economic contribution of higher education institutions the traditional approach has assumed that the value of financial inputs or a university's income (for example, income from the higher education funding councils, tuition fees and the research councils) equals the value of its outputs. However, this type of *'input=output'* analysis does not take account of the value added that universities endow their students through the provision of high calibre education and training.

Since the 1980s, the basic nature of these assumptions has been questioned and attempts have been made to determine the effects on the economy associated with direct university spending. However, these analyses have often only considered the impact of university expenditure on goods and services in the wider economy or external employment generated by university spending. Studies have rarely considered the benefits at an economy wide level resulting from the provision of more highly trained graduates reflected in higher earnings and employment levels.

It is possible to estimate the value of higher education by assessing the earnings and employment outcomes of individuals in possession of higher education qualifications in the competitive labour market. The labour market generally places enhanced values on the increased skills and qualifications attained during higher education, compared to the individuals without those skills and qualifications. This labour market approach to assessing the economic impact of education institutions has been suggested as part of the recent *Atkinson report*³ on measuring public output for the Department for the Communities and Local Government.

We focus on some of the estimates of the value of attaining higher education qualifications, which take into account individual characteristics. Taking into account the differences in an individual's personal characteristics is key to the analysis. It is crucial to ensure that the estimates of enhanced earnings and employment effects are specifically a result of the qualifications and not just the personal and job characteristics of the individuals in possession of those qualifications.

The economic evidence presented in this report illustrates the differences in employment rates and earnings achieved by graduates of working age in the labour market compared to individuals with similar characteristics with the exception of their highest education qualification.

The analyses presented provide estimates of the economic and financial returns to the skills and training that the qualification encompasses, rather than the economic outcomes achieved by those individuals in possession of university qualifications who might achieve high earnings in the labour market anyway.

5. Existing literature on the economic benefits of higher education qualification attainment

There are also substantial non-financial benefits associated with the attainment of higher education qualifications, which are more difficult to quantify. The assessment of these benefits is beyond the scope of this report, but they should be remembered. For example, there are clear benefits associated with an increasingly educated population in the form of improved health⁴, reduced incidence of depression and obesity⁵, mental health⁶, reduced crime rates⁷, social cohesion⁸, civic society⁹ and the intergenerational transmission of skills between parents and children¹⁰.

Since the mid-1990s, the quality of the data containing information on individual qualification attainment at higher education level and associated earnings has improved significantly, as have the methodological approaches for estimating the returns to qualification attainment. It has become increasingly possible to provide robust analyses of the economic returns to higher education qualifications.

There is clear evidence that qualification accumulation results in an increase in the probability of being employed¹¹. In a study representative of the wider economic literature¹², the average earnings premium associated with obtaining a higher education qualification was estimated as approximately 23.5%. This estimate is relative to possession of two or more A-levels when personal, family and ability characteristics are built into the model¹³.

Translated into monetary terms, the discounted gross additional lifetime earnings associated with degree level attainment are approximately £160,000¹⁴.

Relatively few studies have undertaken a detailed analysis of the economic returns associated with different subjects at undergraduate degree level, due in part to the lack of consistent and reliable data. However, findings in the existing studies reiterate that there has been, and continues to be, a significant earnings premium associated with undertaking and completion of higher education qualifications (especially science, mathematics and engineering qualifications) compared to A-levels or equivalent.

There is also a substantial variation in the undergraduate degree earnings premium depending on the subject, as well as the level of study, the individual's gender, and the level of prior attainment.

6. Returns by gender and subject

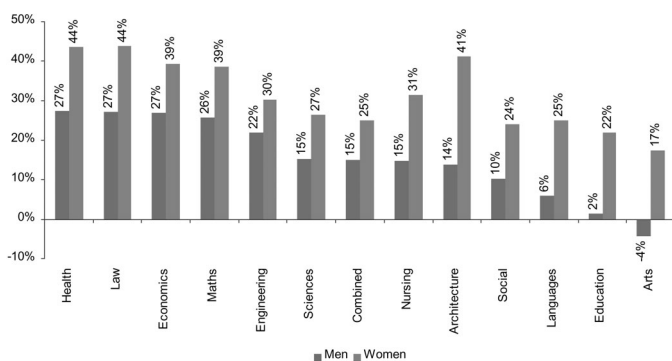
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One of the first analyses to consider the economic benefits of higher education subjects¹⁵ found that men in possession of an undergraduate degree achieved an earnings premium of approximately 15% over individuals in possession of A-levels. The corresponding estimate for women was 19%.

However, men in possession of mathematics degrees achieved a 25.7% earnings premium over those with A-levels as their highest qualification, while corresponding women achieved a 38.6% earnings premium.

In contrast, the premium for men in possession of undergraduate degrees in the arts was 4% less relative to those individuals with A-levels, whilst women achieved a 17% premium. Irrespective of the subject of study, the financial benefit of completing a degree is much greater for women than for men, but this may be due to the relatively low earnings of non-graduate women. These findings are summarised in Figure 1 below.

Figure 1: Earnings premium by degree subject: 1993-1999 labour force surveys

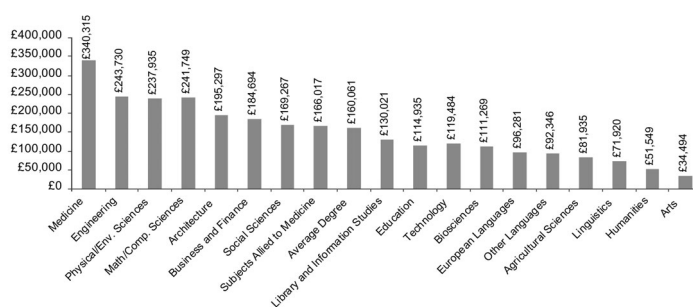


Source: Walker and Zhu (2001)

This existence of a gender gap is also illustrated in the work of Dearden, McGranahan and Sianesi (2005)¹⁶ using the 1970 British Cohort Study, which consisted of a panel of data on a group of individuals born in a week in 1970 who were followed during the course of their lives.

PricewaterhouseCoopers LLP (2006)¹⁷ (PwC) undertook recent analysis to consider the lifetime earnings associated with the average degree holder compared to an individual in possession of two or more A-levels. This analysis assessed the lifetime earnings associated with different degree level subjects and qualification levels – such as postgraduate degrees, diplomas and certificates.

Figure 2: Gross additional lifetime earnings by degree subject compared to two or more GCE A-levels: Pooled labour force survey 2000-2005



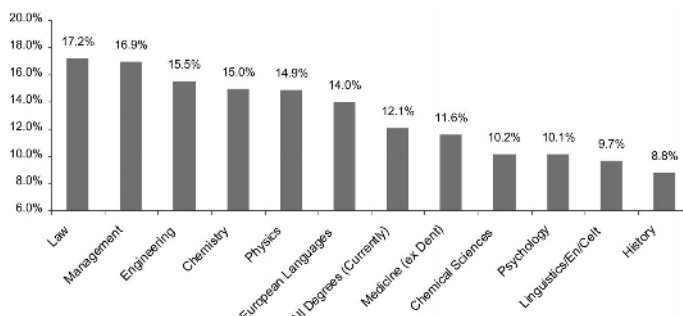
Source: PricewaterhouseCoopers LLP (2006)

In line with previous analyses, the analysis illustrated that, at a UK level, there was significant variation in the returns by degree subject – ranging from an additional gross lifetime earnings of £340,000 to medicine and dentistry to less than £35,000 for subjects affiliated to the arts. The average additional gross lifetime earnings are in the region of £160,000.

Figure 2 presents only the benefits associated with undergraduate qualification attainment and does not incorporate any of the costs into the analysis – either direct or indirect in the form of foregone earnings. Once the costs associated with university attendance in the short term are compared to those benefits later in life, then it is possible to achieve estimates of the individual rate of return.

PricewaterhouseCoopers (2005)¹⁸ undertook an analysis of the rates of return to various different undergraduate degree level subjects. It was found (as shown in Figure 3) that the average rate of return to all degrees was in the region of 12%, while the subjects with the highest rates of return were not those with the highest economic benefits (medicine and dentistry), but those subjects with the lowest costs relative to benefits. In particular, law and management graduates achieved a rate of return of approximately 17%, engineering, chemistry and physics graduates achieved a rate of return of approximately 15%, while those undertaking linguistics, English literature, Celtic studies and history achieved a rate of return of less than 10%.

Figure 3: Individual rates of return associated with different degree level subjects: Pooled labour force survey 2000-2005



6.1 Returns over time in a mass higher education system

There was massive expansion of higher education in the UK during the 1990s, and expansion plans remain. Studies have been undertaken to understand whether the associated increase in the supply of graduates has diminished the earnings premium relative to the comparator group.

The challenge is to understand whether the earnings premium of individuals who are now in their forties and fifties and who have higher education qualifications, enjoy a much greater premium than graduates exposed to mass higher education participation. The challenge is based on the possible difference in relative supply and demand of graduates across the two periods.

Two recent studies answer this challenge and demonstrate that there has been no erosion of the graduate earnings premium since the mass expansion of higher education. They show that there has been an equivalent shift in employer demand for graduates as the supply of graduates has increased.

The first of these studies was undertaken by Dearden et al (2005)¹⁹ which provides findings on graduate premiums achieved by individuals ten years after graduation using the British Cohort Study. The second study is by McIntosh (2004)²⁰ which uses labour force survey data to assess the economic returns to qualifications across the entire working age.

The data used by Dearden et al (2005) follows a single cohort of individuals which was also the first cohort affected by the expansion of higher education. However, ten years into their working lives, their earnings premium was estimated to be essentially the same as that illustrated in the analyses of the Labour Force Surveys encompassing graduates of every age.

McIntosh (2004) found that the average graduate premium achieved across all age groups between 1996 and 2002 was between 21% and 26% relative to the possession of A-levels. More specifically the graduate premium over this period was between 23% and 25% for those aged in the 26-30, 31-35, 36-40 and 41-45 age bands. The graduate premium remains irrespective of the time period in which the higher education qualification was attained.

The study also illustrates the dynamic effects of qualification attainment. For each cohort of graduates, the economic return to their qualifications generally increases over time after controlling for other factors. Having accounted for factors such as age and experience, an undergraduate degree level qualification attracts ever-increasing benefits throughout an individual's working life. This is illustrated in Table 1.

Table 1: Earnings premium between undergraduate degrees and GCE 'A'- levels: males 1996-2002 quarterly labour force surveys

Age Band on 1 Jan 1993	1996	1997	1998	1999	2000	2001	2002	Average	Change 1996-2002
21-25	0.157	0.168	0.214	0.204	0.215	0.239	0.261	20.8%	10.4 pp
26-30	0.248	0.189	0.246	0.243	0.24	0.242	0.288	24.2%	4.0 pp
31-35	0.18	0.254	0.236	0.256	0.228	0.26	0.252	23.8%	7.2 pp
36-40	0.247	0.265	0.28	0.262	0.268	0.191	0.233	24.9%	-1.4 pp
41-45	0.212	0.213	0.275	0.221	0.282	0.261	0.244	24.4%	3.2 pp
46-50	0.285	0.255	0.198	0.184	0.295	0.325	0.284	26.1%	-0.1 pp

Source: McIntosh (2004)

6.2 Returns to level of higher education qualifications

Universities offer a wide range of qualifications in addition to undergraduate degrees. As part of the PwC report (2006), an analysis of the economic returns associated with different types of higher education qualification was undertaken at an aggregated level within one institution²¹.

This study found that the additional lifetime benefit resulting from possession of a postgraduate degree was in the region of £70,000-£80,000 and £30,000- £40,000 for a postgraduate certificate, compared to an undergraduate degree.

The analysis also showed an additional lifetime benefit of £35,000-£40,000 for a HNC/HND and £5,000-£15,000 for a diploma in higher education, compared to A-level attainment.

6.3 Returns by socio-economic group

A second finding of the Dearden et al (2005) analysis referred to previously, relates to the variation in economic returns according to the social class and family income of individuals.

This study found that whilst the average earnings premium associated with higher education qualifications for all men is approximately 15%, the earnings premium for men from lower socio-economic groups was approximately 19-20% (compared to 9-14% for men from higher socio-economic groups).

This differential did not exist for women. Women with higher education qualifications appeared to earn the same premium irrespective of family income and socio-economic grouping. This is illustrated in Table 2 below.

Table 2: Wage returns to higher education compared to level 2 or level 3 qualifications, British Cohort Study 1970

	Males		Females	
	Low	High	Low	High
Socioeconomic Background	19.1%-19.8%	9.0%-13.8%	22.5%-23.1%	23.1%-23.3%
Family Income	19.2%-24.4%	8.6%-13.9%	21.8%-22.6%	20.1%-23.3%

Source: Dearden, McGranahan and Sianesi (2005)

6.4 Returns by non-traditional entry qualifications

The graduate premium is not only affected by the subject studied but also by the age at which the qualification is attained, ethnicity, and qualifications the individual possesses upon entry.

The analyses presented to date have considered the economic returns associated with undergraduate degrees and those with two or more GCE A-levels. However it is clear that not all entrants to university are in possession of A-levels.

The PricewaterhouseCoopers study (2006) made use of the specific entry level qualifications of students attending one particular institution, and found that for undergraduate degrees, less than half of the students were in possession of A-levels (41%) when entering the institution. The majority of students were in possession of 'non-traditional' qualifications, such as GCSE or O-level qualifications (3%), higher education qualifications below degree level standard (6%), professional qualifications (4%) or had entered via an access course (6%) or accredited prior (experiential) learning (3%).

This study constructed lifetime age-earnings profiles that were representative of each individual entry-level qualification. In addition, the analysis generated a weighted average of lifetime earnings to reflect the average entry-level qualifications associated with each qualification the institution offered to its students.

Adjusting the estimates to account for entry-level qualifications of students (rather than the standard two or more A-levels), the PwC analysis illustrated that the additional lifetime earnings premium was in the region of £9,000 more per student compared to the standard £160,000.

6.5 Returns by mature student entry

Mature students undertaking qualifications achieve augmented earnings and/or improved employment outcomes for a shorter period of time in the active labour market (compared to undergraduates participating in higher education between the ages of 18 and 21). Adjusting the standard graduate premium to account for this fact marginally reduces the graduate premium by approximately £3,000-£4,000 per individual.

This result does not mean that there is an insignificant economic return to the late attainment of qualifications. Conlon (2005) and Vignoles' (2004) findings suggest that the main economic benefits associated with the late attainment of qualifications are through the enhanced likelihood of gaining or retaining employment rather than changes to earnings profiles.

7. Comparing costs and benefits and the impact of variable fees

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There are direct and indirect costs to the individual associated with attending university. The direct costs primarily consist of items such as tuition fees and other expenditure directly associated with university attendance. The opportunity costs consist of the foregone earnings whilst undertaking education and training. To understand the rate of return²⁴ to the individual, it is necessary to compare the costs incurred by the individual in the short term whilst at university with the enhanced earnings later in life.

The recent PricewaterhouseCoopers study (2005) for the Royal Society of Chemistry illustrates that the individual rate of return to the *average* degree holder, prior to the introduction of variable fees in England, was about 12.1% per annum, which is above the long-run cost of capital and illustrates the extent to which undertaking and completing higher education qualifications are economically worthwhile (in addition to the intrinsic value of attending university and the non-financial benefits referred to in section 4).

There are significant costs associated with the provision of higher education that are borne by the State. These include funding council expenditure, foregone taxation revenue in the short run, interest rate subsidies on student loans, fee remission and student grants. However, there are also substantial tax benefits accruing to the Exchequer, particularly later in a graduate's working life, as earnings and related taxation payments increase.

Again, prior to the introduction of variable fees, after trading off the costs and benefits to the State, the rate of return to the Exchequer is also approximately 12.1%. In addition to estimating the individual and Exchequer rates of return, this study also modelled the impact of the then proposed student finance reforms in England (set out in the 2004 *Higher Education Bill*) to assess the impact of the student finance reforms on the economic return to the State.

The additional modelling work assumed that there was *no change* to current higher education participation rates or the distribution of students between subjects or institutions. It was assumed that students would not be discouraged from applying to enter university and would not opt for universities offering lower variable fees in some or all of their subjects.

The results indicated that the rate of return to the individual actually *increases* following the introduction of the student finance reforms in England. For a representative degree holder, the individual rate of return *increases* from 12.1% to 13.2%. On the other hand, the rate of return to the Exchequer for a representative graduate falls from 12.1% to 11% simply because many of the new benefits that accrue to the individual are

essentially due to resource transfers or subsidies from the Exchequer to the individual.

This outcome is a result of a combination of a number of factors:

- The removal of the need to pay for fees up front (as was previously the case).
- The re-introduction of maintenance grants for the poorest students and the provision of bursaries.
- An increase in the threshold for loan repayments (from £10,000 to £15,000).
- An increase in the interest rate subsidy associated with the maintenance and tuition fee loans.

The benefits resulting from these policy changes outweigh the additional repayments that must be incurred later in the working life of graduates. In other words, although the 'list' price of higher education has increased relative to the previous student finance arrangements, the net cost incurred by students has not.

In *nominal* terms, the increased benefits associated with grants and subsidies broadly equates with the increase in graduate repayments in the future. However, the fact that these increased repayments generally take place many years into the future while the benefits have an impact now leave the representative student better off than was previously the case.

8. Conclusions

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It is unambiguously the case that the accumulation of human capital is a core determinant of the long-term economic growth of the UK economy and the production of high calibre graduates adds to the wealth and prosperity of the nation and its inhabitants.

Universities are one of the primary providers of education, training and skills through the provision of higher education qualifications in the UK. As such, the economic impact of universities is not limited to the static effect that universities might have as a result of their annual expenditure, but rather the dynamic effect they exert through the generation of human capital.

In addition to the impact that university graduates have on the economic prosperity of the nation, they also achieve significant personal and economic benefits from higher education participation.

The economic returns associated with higher education qualifications is substantial with undergraduate qualifications providing their recipients with an average of £160,000 more in the labour market over their lifetime in today's money terms relative to an individual with A-levels.

There is significant variation by degree subject, qualification type, and the age of attaining the qualification.

Men from lower socio-economic groupings and families with relatively lower family income do particularly well from attaining higher education qualifications. Women do relatively well irrespective of their family background or circumstances.

There is a substantial rate of return to the individual from attaining higher education qualifications, which has increased following the introduction of variable fees.

9. Frequently asked questions

Question 1: How could this information be used to inform institutional planning or individual choice, as it does not take into account the changing environment going forward?

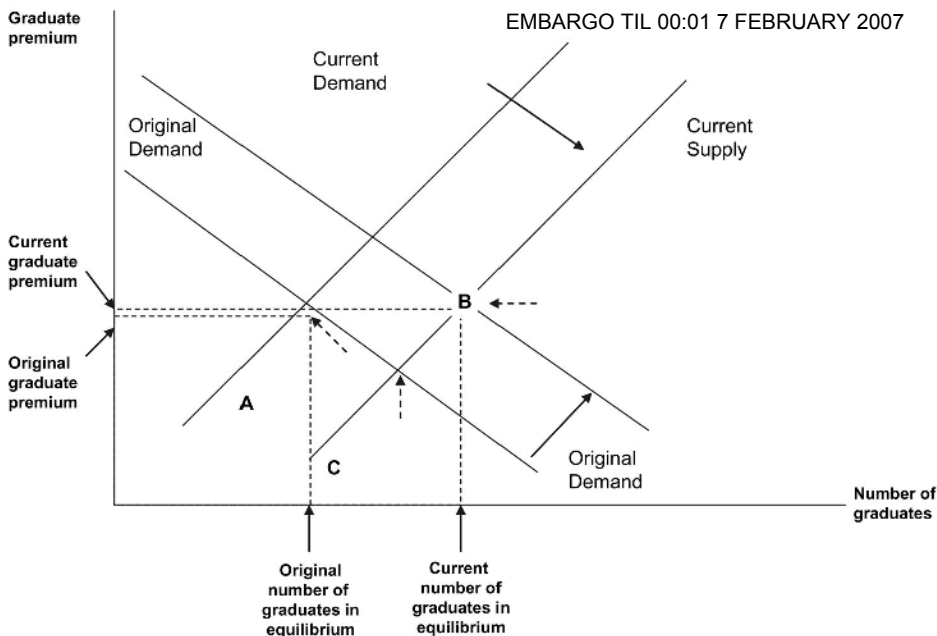
The majority of the analyses presented here are based on recent data. The main factor affecting the graduate premium is the wider macro-economy and its impact on the graduate labour market. A slump in demand by employers for graduates will have the effect of reducing the graduate premium, whereas continued strong demand for graduates will maintain the graduate premium.

Student behaviour is also important as changes in the perceptions of school and degree level subjects may have an effect on the supply of particular subjects. However, the evidence presented here considers the economic returns associated with degree level subjects and not the specific subject related careers associated with individual degree level subjects. For instance, the analyses presented do not assume that individuals studying chemistry work in the chemistry profession. The analyses report on the financial benefits associated with degree subject irrespective of the occupation of the individual.

The evidence presented is robust and generally consistent. This is the case irrespective of the time period under consideration, the methodological or econometric approach or the data analysed. Therefore, in terms of year-on-year changes, we would not expect to see significant changes in graduate outcomes unless there are important macro-economic or policy changes that might affect graduate labour market outcomes.

Question 2: Why does the increasing student population not have a negative impact on the graduate premium?

The reason why there has been no erosion of the graduate premium is due to the fact that although there has been a shift in the supply of graduates in the last 15 years, there has been an equal and equivalent shift in the demand for highly trained individuals. This can be illustrated in the diagram below where 'original' refers to a period prior to the mass expansion of higher education and 'current' refers to the period after the mass expansion of higher education:



- A – Initial equilibrium
- B – Current equilibrium
- C – Equilibrium illustrating reduction in graduate premium in absence of increased employer demand

Question 3: How do you identify individuals with similar characteristics?

In general the econometric analyses identify groups of individuals that are similar according to their observable characteristics with the exception of their highest level of qualification, and then analyse the relative earnings of those groups. The extent to which the similarities between groups of individuals are valid depends on the nature of the data used. For most large-scale data sets, there is information on earnings, personal characteristics (such as gender, age, ethnic origin, marital status, number of children and accommodation details), regional characteristics (region of residence), job characteristics (permanent or temporary contract, full-time or part-time, public or private sector). However, in this report, we have illustrated the findings from the various longitudinal data sources, some of which also include information on innate ability (as measured by test score performance at the age of seven, ten or 11), and family background (parental occupations).

The consistency of the results irrespective of the econometric technique adopted and the data source used adds credence to the assumption that the groups of individuals assessed are indeed alike.

Question 4: Is there information available to show if there are different rates of return for part-time students?

There has been no comprehensive analysis of the economic returns to part-time students in the United Kingdom due to the limited information available on the mode of attendance. Most studies have simply considered the possession of an undergraduate degree

(compared to not being in possession of the qualification) as this has reflected the main policy questions at the time of analysis. It would be *possible* to undertake an analysis of the graduate premium associated with part-time attendance at university using the graduate cohort studies (dating back to 1960) to assess the mid-career earnings of graduates and diplomates from a sample of UK higher education institutions.

Question 5: Is there information available to show if there are different rates of return depending on an individual's ethnicity?

Again this analysis is possible given the data available but has not been the primary focus of analyses considering rates of return to date. In the analyses presented here, ethnic origin is used as an independent variable to control for the fact that earnings might be affected by ethnic origin and to ensure that the earnings estimated are attributable to the qualification and not just the individual in possession of that qualification.

By splitting the sample, it would be possible to assess the relative costs and benefits according to ethnic origin, though the robustness of the results might suffer due to the significantly smaller sample size available.

Question 6: Does this research suggest that a male, mature student would normally see a negative rate of return on the cost of higher education over his lifetime?

It is possible that some individuals will see a negative rate of return associated with their higher education qualification attainment. The primary determinants of the rate of return are the labour market outcomes achieved by graduates and the costs associated with qualification attainment, both of which vary considerably by subject undertaken.

Glossary of terms

Question 7: What evidence is there of the impact of the institution of study on an individual's rate of return?

This area has not been covered in this report because the evidence is so limited – there has only been one study about this in the UK.²⁵

Question 8: How can an increase in fees result in a lower cost to the individual?

The introduction of variable fees capped at £3,000 has raised the nominal price of attending university in England. Although fees and loans have to be repaid during the graduates' working life (up to the point at which the loans are written off), the new fees charged do not have to be paid up front (as was the case before 2006 in England) and at the same time a variety of grants, bursaries and interest free loans available to students have either been re-introduced or increased from their current levels.

The combination of variable fees and the elements of the student finance package have resulted in a relative benefit to the representative student during their period of study and immediately afterwards (compared to the previous student finance arrangements) but a relative worsening of their financial position six to ten years after graduation.

The nominal gain in the short term is broadly equal to the nominal 'penalty' in the medium term. In real terms – or in today's money terms – the gain in the present exceeds the 'penalty' in the future thereby reducing the net economic cost of undertaking and completing higher education qualifications.

Question 9: Does the graduate premium vary according to the location of employment in the UK?

Graduate earnings do depend on the region of residence. However, the estimates of the additional lifetime earnings associated with qualification attainment take into account that some graduates are employed in high cost wage areas and some are not. The analyses referred to in this report assess the economic benefits associated with qualification attainment and not the economic benefit associated with those in possession of those qualifications or the employment location of those with higher education qualifications.

Direct costs: Direct costs are defined as those costs associated with undertaking and completing a qualification that would otherwise not be incurred (such as tuition fees).

Exchequer: Used to mean the Government or Public Sector and used interchangeably with the term *State*.

Indirect costs: Indirect costs consist of those economic benefits that would have been achieved if undertaking and completing the qualification had not taken place (such as forgone earnings).

Premium: Throughout this analysis, premium refers to the percentage by which the hourly earnings achieved by degree holders exceed that achieved by individuals in possession of two or more A-levels.

Present value: The discounted value of a payment or stream of payments to be made or received in the future, taking into consideration a specific interest or discount rate. Present value represents a series of future cash flows expressed in today's currency.

Rate of return: The rate of return is defined as the interest rate (or discount rate) for which the present value of the costs associated with higher education (which generally occur in the present or near future) equals the present value of the benefits derived from higher education (which occur in the more distant future).

State: Used to mean the Government or Public Sector and used interchangeably with the term *Exchequer*.

Value: The (monetary) value of a degree is defined as the difference in the present value of the after tax employment adjusted lifetime earnings of representative degree level holders compared to representative individuals in possession of two or more A-levels.

- 1 The information presented in this report does not differentiate between whether the higher education qualification in question was obtained on a full-time or a part-time basis.
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- 13 This result is characteristic of the types of studies that have been undertaken and reiterates the findings of Dearden (1999), Dearden *et al* (2000), Harkness and Machin (1999), Chevalier and Walker (2001), McIntosh (2004) and Conlon (2005).
- 14 In the Hansard written answer provided by Alan Johnson, Minister for Higher Education, on 8 December 2003, the net additional lifetime earnings premium was estimated to be in the region of £120,000. This is equivalent to a gross additional lifetime earnings premium of approximately £160,000.
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- 16 Dearden, L., L. McGranahan and B. Sianesi (2005) *Returns to education to the marginal learner: Evidence from the British Cohort Study 1970*, Centre for the Economics of Education Discussion Paper 45.
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