Research report

Changing landscapes: future scenarios for variable tuition fees

Universities UK

Research reports

This series of Research reports published by Universities UK will present the results of research we have commissioned or undertaken 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.

This report was prepared by CRA International working with Nigel Brown and Sue Boorman of Nigel Brown Associates.

During this project the consultants were guided by a Universities UK steering group led by Sir Graeme Davies. The consultants interviewed several members of Universities UK and representatives of the four mission groups about the current higher education market and how it might change in the future. We would like to thank everyone concerned for their contributions.

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Changing landscapes: future scenarios for variable tuition fees

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Preface

This report forms an important part of the programme of work that Universities UK is undertaking in preparation for the independent review of variable tuition fees in higher education in England that will begin this year.

We are already monitoring annually a range of quantitative indicators in order to establish the impact of the introduction of variable fees in England from 2006: three reports have so far been published. This new report, which is based on work that CRA International has undertaken over the past few months, extends our work in a new direction by exploring the impact of a possible increase in the fee cap. The aim of the study was to 'construct an economic model for a limited range of future scenarios for variable fees, funding and student support that might be adopted in England following the Government's independent review of fees.'

In constructing the economic models CRA International was asked to assess the implications of various scenarios involving combinations of, for example, different fee levels, different payment mechanisms and different support regimes, including bursaries. The results of the modelling work are summarised in this report but a user-friendly model, available to all Universities UK members, which will enable them to model their institution's financial position under different possible tuition fee regimes, has also been prepared. It should enable Universities UK members (and others) to make informed judgements about the effect of future fee and funding regimes, and to assess the impact on their own institutions.

Any assessments made will need to take account of rapidly changing economic circumstances during a recession on all those involved in funding higher education. Assessments should be sensitive to the impact of possible changes in the funding of higher education on students, graduates and those parents, partners and others who help to fund students' higher education.

The project also considers the wider implications of a change to the fee cap beyond those affecting member institutions. The impact on graduates and the cost to Government are also assessed. The report provides valuable evidence that will underpin the forthcoming debate on the future of tuition fees as well as informing the development of Universities UK's policy position as the independent enquiry begins its work.

Professor Rick Trainor

President, Universities UK

Summary

The terms of reference for this study were to 'construct an economic model for a limited range of future scenarios for variable fees, funding and student support that might be adopted in England following the Government's independent review of fees in 2009'. The aim was to develop a user-friendly model, available to all Universities UK members, to enable them to model their institution's financial position under different possible tuition fee regimes.

The project assessed the implications of each scenario for the finances of:

- different types of university;
- students; and
- government.

This project will contribute to Universities UK's preparations for the tuition fee review in 2009. The report and the model cover only institutions in England providing higher education to full-time students who are liable to pay tuition fees. Higher education programmes covered by these tuition fee regulations are full-time undergraduate degrees and postgraduate courses of initial teacher training. However, the model has been designed so that it could relatively easily be extended to include part-time students in England and full- and part-time students in the other countries of the UK.

To develop this model we have reviewed the evidence on the current working of the fees market today. This includes a review of the literature in the UK and also internationally. To calibrate the sets of assumptions and gauge the response of different types of respondents to factors such as different fee rates and loan thresholds we have undertaken interviews with twelve vice-chancellors from a range of universities with different perspectives on the market. The sample was selected in consultation with Universities UK in order to reflect the diversity of higher education institutions. We also commissioned a dataset from the Higher Education Statistics Agency (HESA) on the student population today, covering all institutions in England in 2006/07.

The selected scenarios

There are many different scenarios depicting the possible future financing of higher education. Many have been considered by different reviews over the last ten years. The scenarios investigated in this assignment were developed by the Universities UK steering group and the project team to cover the range of possible scenarios in the period 2012–16. The scenarios investigated include[1]:

- different variable fee levels ranging from the current position to an uncapped charge; based on the interviews we have investigated the impact of an increase in the fee to £5,000 and to £7,000;
- different mechanisms for fee payment and fee support, which could include:
  - deferred payment – loans with a zero real rate of interest with income-contingent repayments, no means-testing (in other words the current mechanism);
  - means-tested public support for an upfront fee payment (that is, the pre-2006 fee arrangements);
  - deferred payment – loans at a real rate of interest with no means-testing. We have assumed that this effectively removes the government subsidy (other than that attributable to default or forgiveness after 25 years) as it charges for the full cost of its own borrowing;
  - uncapped tuition fees but with capped tuition fee loans, with institutions providing means-tested fee support for the balance between the level of the fee and the capped fee loan.

Based on the interviews we have assumed that there will be an associated bursary and maintenance package that remains equally important in relation to tuition fees as the current arrangements (where on average a third of the additional fee income is returned to students as bursaries).

Inputs to the model

It is clear from this review that the current regime has not created an 'economic market' where price is a significant factor in determining how students choose the university they go to and where universities compete on price to attract students. Based on our research we have concluded that:

- An increase in the fee of up to £5,000 a year is effectively maintenance of the status quo. With a cap at this level universities would not expect to change their behaviour by setting differential fees by course or in terms of student response. The price elasticity of demand for tuition fees below £5,000 a year is effectively close to zero; students are insensitive to variations in tuition fees below this level. We assume that it is zero for the purposes of the model.

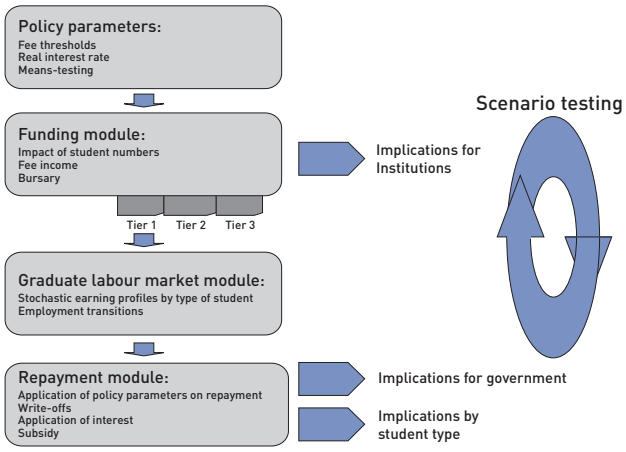
- Increasing fees above the £5,000 level would lead more and more universities to review their policy of setting fees below the cap. Between £5,000 and £7,000 we would expect to see a price elasticity of demand that is greater than zero but remains inelastic (a less than proportionate reduction in enrolment for an increase in tuition fee):
  - elasticity is clearly higher for institutions with students who are debt averse. So institutions whose students come disproportionately from lower income households will face a higher elasticity of demand;
  - universities that draw students from UK domiciles other than England will face a higher elasticity of demand. However, these institutions are already focusing on strategies to compete on quality rather than price. The impact of this factor is thought likely to be small.
- The introduction of a real rate of interest would not immediately have an impact on the numbers of students enrolled (if it was incorporated into a public scheme) and we should assume that students would react to the headline tuition fees. However, the adoption of a real rate of interest could affect repayment behaviour.
- The reaction of students to a private loan at commercial rates could lead to a significant reduction in enrolments.
- Few institutions would exploit the ability to raise fees above the cap if it resulted in the need for commercial loans from private financial institutions.

Based on this input the model has been calibrated to allow for student behaviour under the different scenarios. However, it is also straightforward to change the sensitivity of students to different components of the student finance regime.

The model

To simulate the cost of different tuition fee scenarios we have created a financial model. The model explores the financial implications for the three different sets of stakeholders: students, institutions and the government. A stylised schematic of this is set out in Figure 1.

Figure 1:
Model structure



Source: CRA analysis

The model is a micro-simulation Monte Carlo-type model. This type of model is used because in forecasting student financing repayment behaviour, it is the profile of earnings (rather than average earnings) that determines when loans are repaid.

The outputs of the model

The model produces outputs relevant for the three different sets of stakeholders for the period 2012–2016:

- higher education institutions: the gross and net income (after allowing for bursaries) from tuition fees for different types of student. This can be presented for the sector as a whole or for different types of institution;
- graduates: the average student debt on graduation and the repayment profile; and
- government: the impact on the principal paid out in each year and the subsidy associated with loans issued in each year taking into account the interest charged on the loan.

The model also allows any institution to categorise other institutions into useful comparator groups (or tiers). A group could include only itself or other institutions with similar characteristics. These characteristics can be defined by the user but could include the number of full-time students, the number of international students or the proportion of low income students. Alternatively the user can simply define the particular institutions that it would like to be in a comparator group. The model simulates the impact on student participation and the revenues for the individual institution or tier.

The terms of reference for this study were to 'construct an economic model for a limited range of future scenarios for variable fees, funding and student support that might be adopted in England following the Government's independent review of fees in 2009'. The aim was to develop a user-friendly model, available to all Universities UK members, to enable them to model their institution's financial position under different possible tuition fee regimes.

The project assessed the implications of each scenario for the finances of:

- different types of university;
- students; and
- government.

This study will contribute to Universities UK's preparations for the tuition fee review in 2009. The report only looks at institutions in England providing higher education to full-time students liable to pay tuition fees[2]. Higher education programmes covered by these tuition fee regulations are full-time first or undergraduate degrees and postgraduate courses of initial teacher training.

1.1 The current system and the 2009 review

The current variable fees regime was introduced in 2006/07. The fundamental elements of the current system are:

- a tuition fee with a cap of £3,000 (up-rated by inflation each year[3]) - for 'home' and EU students admitted from 2006/07 following full-time undergraduate programmes at a university or college in England. The cap has since been increased to £3,145 in 2008/09.
- a non means-tested student loan for tuition fees provided by the Student Loans Company; the maximum loan a full-time higher education student could be eligible for in 2008/09 to cover the cost of tuition fees is £3,145. A student is entitled to a loan for each year of their undergraduate course.
- a student loan for maintenance also provided by the Student Loans Company: the maximum loan for maintenance for a full-time undergraduate student in 2008/09 is £6,475 for students studying away from home in London. The maximum figure for those studying outside London will be £4,625 for 2008/09. All eligible full-time students can get a student loan for maintenance. The exact amount students can borrow depends on several factors, including household income[4], where the student lives while studying and whether s/he is in the final year of the course. The loan amount is also affected by any help received through the maintenance grant (though not the special support grant)[5].
- students may also be eligible for means-tested higher education maintenance grants. New entrants to higher education in 2008/09 with an annual household income of £60,005 or under will get at least a partial grant. New entrants to higher education in 2008/09 with an annual household income of £25,000 or under will get the maximum grant of £2,835 for 2008/09. For 2008/09, a third of all new students are expected to receive the full amount of maintenance grant, while a further third will receive a partial grant, depending on their household income.
- institutions that charge fees between £2,700 and £3,000 have to provide non-repayable bursaries for students eligible for the full higher education maintenance grant or special support grant of at least £300 for 2006/07 and £310 for 2008/09.

Student loans are repayable after students have finished their course and are earning more than £15,000 a year[6]. The first repayment is due in the April after leaving the course (from the start of the new tax year). Currently graduates pay 9 per cent of any earnings over £15,000 (or the monthly or weekly equivalents) but they can choose to repay more and clear the loan faster. The loans are charged an interest rate equal to the rate of inflation in that year; in effect the loans have a zero real interest rate, with the result that the Government is subsidising the loans compared to its own cost of borrowing.

In practice, although institutions theoretically had the choice whether to charge the full tuition fee, almost all chose to set the fee at the £3,000 cap. A small number of institutions decided to charge below the cap or to charge a lower fee for particular courses (for example, sub-degrees).

There has been a much greater degree of variability in the implementation of bursaries across different institutions[7]. Whereas some institutions have effectively offered a flat bursary to all students, others have targeted bursaries on students from lower income families. The result is that the schemes vary considerably in their complexity and the maximum bursary offered.

On 26 January 2004, the then Secretary of State for Education and Skills announced during the report stage of the higher education bill that the Government would establish an independent review in 2009 to report to Parliament on all aspects of the new variable fee arrangements in England, based on evidence from the first three years of operation and other policies. This review would therefore cover the three academic years from 2006/07 to 2008/09.

The draft remit of the review covered:

- the impact of the new arrangements on higher education institutions, including the extent to which higher education institutions have varied fees, the additional income raised, provision of bursaries and the effect on the academic portfolio;
- the impact of the new arrangements on students and prospective students, including the overall level of applications, participation rates by different socio-economic groups, student support arrangements, choice of institution, choice of mode, completion rates and level of debt;
- future policy: changes to the graduate contribution scheme and the upper limit for tuition fees, and changes in the arrangements for student support.

Our report focuses on the last of these areas. We review evidence on the current working of the market to see what this tells us about future changes in the market. To be pragmatic we focus on how a new regime would change the higher education sector between 2012 and 2016. We have assumed that 2012 will be the earliest date in which any change in the financing of higher education could be introduced and focus on the following five years to allow us to understand how the changes would affect the market once they settle down. Given the ongoing changes in student demographics and the evolution of policy, a five-year time frame is also pragmatic from a policy perspective[8].

1.2 The selected scenarios

There are many possible scenarios for financing higher education in the future. Many of these have been considered by different reviews over the last ten years[9]. The scenarios we investigated were developed by Universities UK and the project team to cover the range of possible scenarios in the period from 2012 to 2016. They therefore take the existing arrangements as the starting point and adapt the model in several directions. The aim is to highlight the merits of different systems, even if the system the Government eventually adopts turns out to have a combination of these features.

The scenarios we selected for investigation include[10]:

- different variable fee levels ranging from the current position to an uncapped charge; based on the interviews, we have investigated an increase in the fee to £5,000 and to £7,000;
- different mechanisms for fee payment and fee support, which could include:
  - deferred payment – zero real rate of interest loans with income contingent repayments, no means-testing (i.e. the current mechanism);
  - means-tested public support for an upfront payment (i.e. as in the pre-2006 fee arrangements);
  - deferred payment – loans at a real rate of interest with no means-testing; we have assumed that this effectively removes the public subsidy (other than that attributable to default or forgiveness after 25 years) as the Government charges at its own cost of borrowing;
  - uncapped tuition fees but with capped tuition fee loans, with institutions providing means-tested fee support for the balance between the level of the fee and the capped tuition fee loan;
- an associated bursary and maintenance package – which we have assumed remains as important as the current arrangements (and assumes that on average a third of additional fee income is returned to students as bursaries).

This report sets out the results for eight scenarios as listed below.

Table 1:
Scenarios to be investigated

Scenario	Tuition fee cap	Loan scheme	Bursary/ maintenance package
Scenario 1: Current loan system	£5,000	No means test, zero real	Same as today
Scenario 2: Current loan system	£7,000	No means test, zero real	Same as today
Scenario 3: Means-tested support	£5,000	Means-tested, zero real	Same as today
Scenario 4: Means-tested support	£7,000	Means-tested, zero real	Same as today
Scenario 5: Real rate of interest	£5,000	No means test, real rate	Same as today
Scenario 6: Real rate of interest	£7,000	No means test, real rate	Same as today
Scenario 7: Capped loans	£5,000	Capped public loans £3,000	Same as today
Scenario 8: Capped loans	£7,000	Capped public loans £3,000	Same as today

Source: CRA analysis

1.3 The evidence

We did a literature review on the impact of tuition fees on higher education students and universities. We considered the evidence on the impact of the introduction of the £3,000 fee in the UK and how tuition fees have changed student behaviour in other countries.

To calibrate the sets of assumptions and gauge the response of different types of respondents to factors such as different fee rates and loan thresholds, we interviewed a sample of twelve vice-chancellors from a range of institutions with different perspectives on the market. The sample was selected in consultation with Universities UK to reflect the diversity of universities and differentiating features such as:

- local / national recruitment;
- metropolitan or rural location;
- elite, other pre-1992, post-1992 and post-2004 universities;
- widening participation;
- high ethnic minority recruitment;
- whether principally serving local or national labour markets.

Interviews were conducted by telephone under Chatham House rules on the basis of a common set of questions (see Appendix B).

1.4 Student data for the model

We commissioned a bespoke dataset from the Higher Education Statistics Agency (HESA) on the student population today. This covers all institutions in England in 2006/07 and includes over a million observations.

Table 2:
HESA dataset – variables included

Variable	Categories
Domicile	UK / EU
Higher education institutions	169 UK institutions (of which 133 in England)
Gender	Male / female
Degree-type	First degree / other undergraduate degree
Degree differentiator on the basis of cost	Segmented in three classes (set out in Appendix A)
Expected course length	1,2,3,4,5
Year of study	Filtered on Year 1
Average student age	
Proxy for parental income	9 categories (1) Managers and senior officials, (2) Professional occupations, (3) Associate professional and technical occupations, (4) Administrative and secretarial occupations, (5) Skilled trades and personal service occupations, (6) Sales and customer service occupations, (7) Process, plant and machine operatives, (8) Elementary occupations, (9) Retired/unemployed

Source: CRA analysis

1.5 The structure of the report

The report has three further chapters.

In Chapter 2, we set out how the current higher education market works, the evidence from the literature and from the interviews with the sample of vice-chancellors.

In Chapter 3, we explain the model created to cost the eight scenarios.

In Chapter 4, we set out the results of the costing model, the implications for different stakeholders, and how the model could be used by individual institutions.

To understand how the higher education market in England would react to different tuition fee scenarios we have drawn upon:

- evidence on how institutions responded to the introduction of the £3,000 tuition fee cap and associated bursaries;
- the existing literature on the UK and relevant international markets; and
- interviews with vice-chancellors from a sample of higher education institutions reflecting the range of institutional characteristics in England.

2.1 The literature

It is clear that the current system with a maximum annual fee of around £3,000 has not resulted in an economic market. As Chester and Bekhradnia point out, there is little 'variability in fee levels and therefore the market in higher education, which the Government believes is necessary to improve quality and choice, is not currently operating in the way it anticipated'[11]. Foskett and colleagues found that most institutions charge the maximum fee, which implies that the previous announcement of an upper price limit had failed to create a market[12].

Price insensitivity of students with respect to enrolment

Although Foskett and colleagues say that there are no specific estimates of the price elasticity of demand for higher education in the UK, they observe that the market is generally price inelastic[13]. Evidence from the introduction of fees in the UK in the past, along with evidence from Australia's Higher Education Contribution Scheme (HECS), shows that students have generally been price insensitive when it comes to deciding whether to enrol in higher education.

So far, the limited effect of fee changes on student demand for higher education is partly explained by the fact that the biggest increases in fees have been masked by the availability of public funding for full-time undergraduates[14]. The same paper notes that part-time and post-graduate students, who have very limited access to public financial support, have not been discouraged from participating.

However, it seems likely that individuals from lower socio-economic groups are more sensitive to price than those from higher groups. An article in 2005 on the BBC website suggested that the higher costs associated with the introduction of variable fees would lead to a slight increase in those who had regrets about having gone to university, mainly reflecting the higher level of regret about entry to higher education among the most financially disadvantaged. Moreover, the impact of prospective debt was even greater for disabled students, probably because they are less able to work to pay their bills[15]. According to Foskett, groups likely to be the most price sensitive include:

- students in London;
- those thinking of studying in London;
- students unsure about the value of a graduate education;
- poor students;
- mature students; and
- recent graduates considering postgraduate training.

Foskett interviewed potential higher education applicants who decided not to go to university. Although respondents were concerned about the risk of the debt they would accumulate if they went to university, fees and loans were not the main deterrent in their decision against higher education. These respondents simply did not consider themselves as 'ready to embark on a career path'[16].

Evidence from other countries

The evidence above as well as news articles throw light on the impact of the introduction of the HECS in Australia. Participation in higher education has continued to rise while social class representation has remained broadly static.

In 2005, when Australian universities were allowed to increase fees by 25 per cent, almost all of them did so, and those that did not were unable to increase their market share. One Australian university even reduced its fees to zero, but this did not result in any significant increase in enrolments. Although the composition of the student body is different in Australia and has different expected behaviour patterns to the UK, this evidence suggests that participation and enrolment in higher education are not necessarily affected by increasing fee levels[17].

In the United States, where there is a much more 'free market approach'[18] to the pricing of higher education programmes, a high price sometimes increases the desirability of attending a particular institution – some argue that even though there might be concerns about the affordability of higher education in the United States, the fact that a high price is often seen as an indicator of high quality often deters institutions from contemplating tuition fee cuts. However, higher education in the United States is in many ways very different from the English system where tuition fees represent a relatively small proportion of teaching costs, assumed family contributions are low, and government is responsible for most of the financial support that students receive[19]. The English system may more closely resemble Australian higher education, where perceived quality is influenced by required entry grades rather than price or fee levels[20].

Impact on widening access

Although there is no established evidence that an increase in fees will affect the level of enrolment, Davies and colleagues note concerns about changes that would shift more of the financial burden to students, and which might work against stated policy that aims to widen participation. Davies also points out that any increase in fees disproportionately affects those from lower socio-economic backgrounds, who are more debt averse, and who have lower expected earnings after graduation[21].

Fear of debt

Davies refers to research showing that debt averse students were less likely to enter higher education than those who were debt tolerant, and that students from financially disadvantaged backgrounds have been found to be more debt averse than their wealthier counterparts. In Davies' own survey, 59 per cent of students from selected urban areas reported that avoiding debt had 'much' or 'very much' affected their decision to enter higher education. It is not just a question of attitudes to debt, but a question of real and differential risk which will be exacerbated if fees rise – students from lower income families take a greater risk when enrolling in higher education than their counterparts from wealthier backgrounds, especially if what they earn at graduation does not meet their initial expectations[22]. Nevertheless, the income contingency of the repayment regime and the provision for loan forgiveness mean in practice that the risk is shared with Government and all other borrowers.

Lack of appropriate information

It is possible that the fear of debt stems from lack of information about the benefits of higher education and the financial support available to students. Although potential students do know about the key aspects of the higher education funding system, they know very little about what financial support (grants and bursaries) they can access[23]. A recent press article suggested that the main factor deterring students of low-income families from pursuing a degree, or prompting them to stay at home if they do, is the lack of knowledge about financial support and confusion about the different types of debt that they may incur[24].

A report into student finance argues that making marginal changes to the current system might complicate it to the extent that students are either deterred from entering higher education at all or from claiming their full entitlements[25]. There is also no doubt that a more complex system would be extremely difficult to administer.

The contrary position, however, has been articulated by Professor Nicholas Barr who is optimistic about students' ability to access and digest information about higher education. He argues that students are largely well informed, and believes that higher fees, which will lead to greater competition in higher education, will ultimately benefit them as consumers[26].

Choice of institution

Social differences influence students' tendency to stay at home and attend a local university, instead of going to a university away from home. Among students who are considering going to university, their financial background is a strong indicator of whether they will decide to live at home[27].

Davies found that students with an Asian ethnic background are more likely than other ethnic groups to plan to live at home while studying. The reluctance to move away has a social as well as a financial aspect – students from Asian backgrounds are more likely to live at home, whatever their financial circumstances, to 'draw on their existing social networks'[28].

The number of students planning to study at universities close by so they can live with their families has risen from 18 per cent in 1998 to 56 per cent in the beginning of 2008[29]. However, the validity of these figures has been questioned. The reason behind the high percentage considering going to a local university may be the ready availability of local institutions for the participants interviewed. Detailed data on the distance between home and place of study suggests that the decline observed in recent years has now slowed significantly.

Choice of course

With higher fees, one can expect fewer students to progress to postgraduate study, fewer students to choose longer courses such as architecture or engineering, and more students to work part-time (not only to cope with higher fees, but also to support a decent student lifestyle and gain skills and experience)[30]. A concern with debt repayment can affect career preferences, which in turn affects the type of course pursued[31]. Students may choose to study part-time rather than full-time, especially if they can continue to work while pursuing a degree[32].

Type of student

Students' perceptions of their future place in the labour market and their earnings potential can be a disincentive, especially for students from less advantaged backgrounds, to enter higher education. Most studies on the benefits of participating in higher education in the UK suggest that the rates of return are high enough to provide clear economic incentives to participate – these studies base their conclusions on estimates of the average rate of return to graduation. However, Adnett and Slack note that this average rate could overestimate the returns of higher education to 'marginal entrants, particularly those from disadvantaged backgrounds'[33].

Gender differences in expected earnings and perceived debt might also influence incentives to participate in higher education. Women are expected to earn less than men upon graduation (the gender pay gap). This, along with the time a woman may take off from work for maternity leave or to care for children, results in women taking longer to repay their student loans. On average, a woman stays in debt for a relatively long time – women graduates face 16 years of student debt while men can expect to settle the bill for their education within 11 years. One might expect that an increase in fees would therefore adversely affect female participation in higher education[34].

Bursaries and private loans

Tuition fees are only one factor; institutions offer bursaries and where increased tuition fees are not funded through public loans, private institutions might be used to finance the additional charge. Many institutions offer bursaries on a means-tested basis of considerably more than the minimum requirement specified by government. Chester and Bekhradnia cite the Director of the Office for Fair Access (OFFA)'s observation that variable bursaries, rather than variable fees, are where the market place for higher education currently operates[35].

Bursaries usually make a difference to a student only when they are large and universities with the fewest poor students can afford to offer the highest bursaries[36]. But economically disadvantaged students are the ones for whom bursaries are most important. Only 6 per cent of students from families with incomes of above £35,000 reported that bursaries would be a factor in choosing a university (compared to 11 per cent for an 'average' student). For black students, nearly 30 per cent consider bursaries to be important.

Evidence on the take-up of bursaries shows that there is a significant difference between the number of students eligible for bursaries and the number of bursary awards actually paid. This is the primary reason for the differences between universities' estimated and actual expenditure[37]. The OFFA report indicates that, in 2006-2007:

- 58 per cent of higher education institutions spent below 90 per cent of their predicted expenditure on bursaries;
- 8 per cent spent between 90 and 100 per cent; and
- 33 per cent spent 100 per cent or more than they had predicted.

In the same time period, 12,000 students who were eligible for a bursary did not consent to share information provided to the Student Loans Company with their university (by ticking the appropriate box on a form) and therefore could not be awarded bursaries.

Private loans and loans with market interest rates

The Institute for Fiscal Studies argues that if it is uncertainty around future earnings that most deters potential students from taking on the cost of studying at university, then introducing a commercial interest rate for maintenance loans would require graduates to take on substantially more risk[38].

The rising use by students of private loans in the United States shows clearly that private loans have extremely high costs (the average annual interest rate charged was 11.5 per cent), with origination fees averaging 4.5 per cent of the loan volume.

Institutional funding

The analysis above has focused on whether the demand for higher education would be affected by the level of tuition fees or the financing arrangements that students are offered. However, the price that institutions charge is also determined by their financial constraints.

The higher education sector in the UK is under considerable financial pressure. Some higher education institutions are in debt. All face significantly increasing salary and operating expenses year on year, which are coupled with the need for major capital investment to provide estates and facilities that meet disability access requirements and provide for a growing and increasingly diverse student body with rising expectations. Participation in higher education in the UK has increased dramatically over the past 40 years, but this increase has not been accompanied by a proportionate increase in funding. HEFCE reported early in 2008 that the current level of borrowings by higher education institutions, as a proportion of the level of total institution income, is the highest since 1997[39].

2.2 The interviews

To provide some underpinning of the central assumptions on tuition fees and student support that we have modelled, we asked a sample of vice-chancellors from 12 universities for their views on several key questions.

Because of the small size of the sample and the need to operate within Chatham House rules so that the views of individual vice-chancellors were not disclosed, the responses presented here cannot be fully quantified, but offer an overall but well-informed view of future developments.

The questions we raised were aimed at:

- identifying a fee level at which undergraduate teaching provision would be sustainable in the longer-term;
- identifying a fee level at which a real market would emerge, with different institutions charging different fees for different programmes;
- assessing the likely response of institutions to a system in which full-time fees were deregulated (the fee cap removed) but public subsidy in terms of public loans was limited to a lower fee;
- assessing the likelihood of the emergence of differential fees by subject;
- assessing the potential impact of changes to the loan repayment regime, in particular the introduction of a real rate of interest on student loans, on participation and institutional behaviour in respect of setting tuition fees and any decision to limit public funding support to a fee level below any assumed cap;

- assessing how bursaries might develop in future;
- finding out views about the sensitivity of student demand to potential debt levels on graduation;
- assessing the possible impact of the demographic decline in demand between 2010 and 2019 on institutional decisions about fee levels;
- tailoring the model better to offer the kind of features institutions would find desirable in terms of outputs and the ability to vary the inputs.

Tuition fee levels required for sustainability

Between them interviewees suggested a very wide range in the level of the fee that would be required to secure the long-term sustainability of undergraduate teaching. The median figure was around £6,500 at 2009 prices.

The variation in the suggested fee level reflected in part the comparators on which individual vice-chancellors drew and might also reflect differences in subject mix and the variation in ease of recruitment. Currently all the assumed differential in costs by subject is in effect carried by the HEFCE grant.

In probing vice-chancellors about the fee level required we asked them to assume no change in the current level of HEFCE funding. Some commented that they believed that this assumption was unsafe in the light of the review of the teaching funding method and recently imposed policies such as the withdrawal of funding for students studying for a second or subsequent qualification at a level equivalent or lower (ELQ) than one they already held.

All vice-chancellors pointed to the continuing faster rise in their operating costs than the factor assumed for updating tuition fees in line with inflation. Several also pointed out the one-off increase in costs (separate from annual pay settlements) that they faced from the introduction of the new pay framework and the costs of keeping their infrastructure up-to-date and competitive.

There was a general recognition of the political difficulties for the Government in going to Parliament to seek a substantial increase in the fee cap and the financial difficulties of increasing the loan subsidy to graduates as would be required by an increase in the publicly supported fee loans. Yet, without any increase, much undergraduate teaching would be increasingly unsustainable after 2010.

Some were concerned about the impact of any increase in the tuition fee because of the nature of their student body. However, as was also pointed out to us, the income-contingent nature of repayments ought to make individuals less sensitive to the total size of the fee loan.

The emergence of a tuition fee market

As might be expected, vice-chancellors differed in their estimates of the fee level at which their institution might decide to charge below the maximum permitted fee and the fee level at which others would consider charging less than the maximum. There was clearly a balance to be struck between maximising institutional income, providing the appropriate signal on quality, and not putting off certain groups of potential students.

Some pointed out that, even at the current level, some institutions had decided either to offer a fee at £2,700 or below (the maximum fee allowed if statutory bursaries are not available) or to offer bursaries to a very high proportion of their students, based on a high qualifying level of parental income. Any increase in the fee above its present level in real terms would be likely to increase the number of institutions choosing to charge less than the maximum, and at a maximum fee level of £7,500 a market would begin to emerge. A full market fee regime would, however, only emerge if maximum fee levels were above £10,000.

The potential impact on student demand and the behaviour of competitor institutions were the key factors that vice-chancellors identified as affecting any decision to charge below the maximum permitted fee. For example, levels of demand for particular subjects, rather than cost, would be the principal determinant of the subjects for which institutions would choose to charge higher fees in a more differentiated market system.

However, some interviewees considered that price would be a very important signal of quality in any market and it would be necessary to exercise due caution in setting fees below the permitted maximum.

The impact of introducing a capped public contribution to fees

We asked vice-chancellors to consider a scenario in which the public contribution to tuition fees was capped through limiting the availability of publicly subsidised loans, but with institutions able to charge fees above this level. Some thought that this was a likely outcome, but that it would raise very significant issues about how students would meet the balance between the publicly supported fee and the fee charged by some institutions. Some considered that their institution would charge above the publicly funded maximum while others considered their institution would only charge at the maximum publicly funded level assuming that this was set at a level that they felt able to charge within their particular market.

The presumption that the balance of the fee above the publicly funded element would have to be paid upfront would be a significant disincentive to participation by some types of student. This alone would limit the willingness of some institutions to charge fees above the publicly funded fee cap.

Those vice-chancellors who considered that their institutions would decide to charge fees above the maximum eligible for public funding support recognised that they would need to extend their bursary arrangements or introduce a scheme of fee waivers. This would need to include students from a wider range of family incomes than the current means test because of the difficulties students from middle-income families would face in raising the balance of the fee. Bursaries would also need to be more targeted towards supporting fees. Fee waivers were not generally supported, however, as they had a significant administration cost. Student bursaries on the other hand were currently centrally administered by the Student Loans Company (for most institutions).

It was also inevitable that such a system would be more complex than the current system of financial support and even this system is not well-understood by many students or their advisers. The increased complexity might completely deter some students from entering higher education.

An assumption that students would meet the balance of the fee from commercial borrowing would radically change the dynamics of the current system. Such a mixed public/private funding system would be socially regressive. Some students from poorer families could find themselves unable to secure such loans because of the lack of any family credit history and they would thus be forced to enrol at an institution charging fees within the publicly funded cap. Its introduction would also be strongly contested by students and their representatives, who would argue that commercial lenders could not be trusted to ensure the availability of finance or to keep to the conditions attached to loans, such as interest rates.

Differential fees by subjects

Several vice-chancellors noted that their institutions already charged lower fees for foundation degrees, sub-degree and foundation programmes, but so far they had not charged different fees to home and EU undergraduates according to what subjects such students were studying. Fees for international students, however, were not only higher but also often already differentiated by subject of study. The only circumstance in which many vice-chancellors would contemplate proposing to charge differential fees on a subject basis for home (and EU) undergraduates would be if the fee cap was removed altogether.

Pricing policy would be driven largely by the popularity of subjects in terms of the number of applicants per place. However, it might also be used to convey signals about quality to prospective students.

A real rate of interest on student loans

The absence of a real rate of interest on student loans made by the Student Loans Company represents the principal element of the public subsidy of these loans. Opinions varied on whether a decision by Government to charge future students a real rate of interest would have any real impact on demand.

Those who believed it should have little or no impact argued that it would have no effect on the repayment rate, but only on the repayment period. Others believed that it would restore debt aversion as a factor by making the student loans more similar to commercial loans and thus act as a disincentive to participation.

A real rate of interest would increase total repayments (although not the repayment rate) and therefore affect the net benefit of full-time undergraduate higher education to individuals. This could shift the balance against participation for people wishing to study certain subjects where the financial benefit was already below average or for certain types of individuals, such as older students, whose earning potential was lower.

Some vice-chancellors saw the option of charging a real rate of interest on part of the student loan as a solution that would allow the removal of the cap on tutition fees while keeping a cap on the public spending contribution; fee loans with a zero real rate of interest would continue to be available up to a specified fee level, with loans at a real rate of interest also available to meet the cost of the balance of a higher fee. Such an option, although complex, would be preferable to involving commercial banks.

The future development of bursaries

Most of the vice-chancellors interviewed did not consider that the current bursary scheme was fulfilling its stated aim – to remove the financial barrier to higher education for students from low-income families. Even institutions that had simple bursary schemes had experienced lower take-up than expected, reflecting in part the forms that students had to fill in when applying for national student support. Opinion was, however, divided on whether a national minimum bursary scheme, funded by top-slicing institutions' additional fee income, was a desirable way forward.

Several interviewees observed that the availability of bursaries does not appear to be a major factor in student decisions to apply for a particular institution. Although there was some limited support for the alternative of a fee waiver, most believed that it would have similarly little effect on the choice of institution within the current fee regime and would have to be administered locally.

Despite the general view that the current bursary scheme had not served its intended purposes, most vice-chancellors considered that, in higher fee scenarios and especially those involving limits on public funding support, institutional bursary and student support schemes would have a vital role to play in encouraging applications from poorer students. However, unless there were funds available in addition to the increased fee itself, such as alumni funds, institutions themselves would not be able to provide sufficient financial incentives.

Price sensitivity of student demand

Arguably, with the current deferred payment arrangements for full-time undergraduate tuition fees, demand should not be sensitive to the fee level, but the fact that potential students tend not to understand the deferred payment system means that some still worry about fee levels and graduate debt. Nevertheless, in practice, since the introduction of the variable tuition fee arrangements in 2006 there has been little impact on overall demand. A few vice-chancellors felt that it has had some impact on subject choices by students.

On the other hand many of the interviewees thought that prospective changes to the financial regime in terms of fee levels, debt incurred or loan repayment terms could have a significant impact on students' choice of institution or subjects. Vice-chancellors perceived that demand was no longer price-inelastic. The emergence of a differential fee regime either by institution or subject would be likely in their view to distort the pattern of demand.

2.3 Trends in higher education enrolment

The academic literature and the interviews both highlighted the need to take into account demographic changes within the UK and worldwide.

Demographers and others have warned that the low birthrate in the 1990s means that the number of 18-year-olds in the UK will fall drastically between the years 2010 and 2019[40]. It follows that unless participation rates go up, the number of entrants to UK universities over the next decade appears likely to decline whatever the prevailing higher education fee arrangements. Universities are facing increasing competition from private colleges which are now accredited to award qualifications and in some cases have received degree-awarding powers. These could compete for traditional undergraduates[41]. Several of the vice-chancellors considered that their institution would be shielded from the impact of the projected demographic decline either because of the region they served or the types of student that they mainly recruited. A few acknowledged, however, that the demographic decline would significantly affect their recruitment and have implications for the tuition fee levels that they were able to charge.

International students are charged much higher fees than UK and EU domiciled students, as their fees are not subject to regulation; such fees accounted for around 8 per cent of total university income in 2006/07. There has been a growth of e-learning (distance learning) in countries such as India, which may significantly affect enrolment of international students from such countries. There has been a considerable slowing down of growth in international applications to universities in the United States. Most of this decline is from India, China and Korea, partly reflecting difficulties in obtaining US visas, but also more importantly the expansion of these countries' own higher education systems, encouraging students to stay in their home countries. In China, for example, the number of graduate students has more than doubled since 1998[42]. Against this background, UK universities can no longer rely on a steady influx of international students to sustain their overall fee income in the future.

2.4 Conclusions about the changing market

It is clear from the literature review and the interviews that the current fee arrangements have not created an 'economic market' in which the price of an institution is a significant factor in how potential students choose the institution they want to go to and in which institutions compete on price to attract students.

Looking at the evidence described above:

- an increase to £5,000 a year is effectively the maintenance of the status quo. Institutions would not start setting differential fees by course and students would behave in much the same way. The price elasticity of demand for tuition fees below £5,000 a year is effectively close to zero – students are insensitive to tuition fees below this level. We assume that it is zero for the purposes of the model.
- increasing fees above £5,000 would lead more and more institutions to review their practice of setting fees below the cap. Between £5,000 and £7,000 we would expect to see a price elasticity of demand that is greater than zero but remains inelastic (less than proportionate reduction in enrolment for an increase in tuition fee):
  - the elasticity is clearly higher for institutions with students who are debt averse. So institutions whose students come disproportionately from lower-income households will face a higher elasticity of demand.
  - institutions that draw from domiciles outside England will face a higher elasticity of demand. However, these institutions are already focusing on strategies to compete on quality rather than price. The impact of this is thought likely to be small.
- the introduction of a real rate of interest would not immediately affect the numbers of students enrolled (if it was incorporated into a public scheme) and we should assume that students would react to the headline tuition fees. However, this could affect repayment behaviour.

  The reaction of students to a private loan at commercial rates would be significant and could lead to a significant reduction in enrolment. Few institutions would exploit the ability to raise fees above the cap if it resulted in commercial loans from private financial institutions.

Table 3:

Assumptions about elasticity of demand in the model

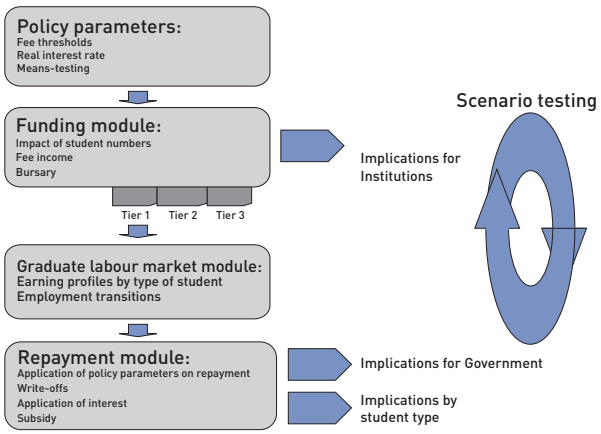
Characteristics of the scenarios	Type of student	Elasticity of demand
Tuition fee < £5,000, public loans	All	0
Tuition fee > £5,000, public loans	Lower socio-economic households (with parental household income <£50,000)	-0.1
	Mid-upper socio-economic households (parental income >£50,000)	0
Tuition fee > £5,000, public loans and real rate of interest	Lower socio-economic households (parental income <£50,000)	-0.1
	Mid-upper socio-economic households (parental income >£50,000)	0
Tuition fee > £5,000, capped public loans	Lower socio-economic households (parental income <£50,000)	-0.3
	Mid-upper socio-economic households (parental income > £50,000)	-0.1

Source: CRA analysis

To simulate the cost of different tuition fee scenarios we have created a financial model. This looks at the financial implications for the three different stakeholders: students, institutions and the Government. A stylised schematic of this is set out in Figure 2.

Figure 2:

Model structure



Source: CRA analysis

3.1 The base data

The data that we have used for our model and which allows us to generate a student sample that is representative of the current student population is the HESA student data set[43].

The dataset contains information on students from 169 UK higher education institutions, of which 133 are in England. It gives us information on students enrolled in these institutions for the reporting period from 1 August 2006 to 31 July 2007, inclusive.

The variables contained in the dataset include:

- the name of the higher education institution;
- the gender of the student;
- type of degree in which the student is enrolled, which indicates whether the student is enrolled in a first degree, other undergraduate degree, postgraduate or PGCE;
- mode of study, which indicates whether the student is full-time or part-time;
- domicile of the student, which tells us whether the student is from the UK, outside the UK but in the EU, or outside the EU;
- the age of the student;
- the socio-economic classification (SEC) and Standard Occupational Classification 2000 (SOC2000), which both throw light on the socio-economic background of the student and give us some idea of their parental income;
- ethnicity of the student;
- year of the programme in which the student is enrolled;
- the country in which the higher education institution is located, that is whether the institution is in England, Northern Ireland, Scotland or Wales;
- a cost centre variable, which provides information on the type of course which the student is pursuing, for example mathematics, social studies, clinical medicine, physics.

For every combination of the above variables, the dataset gives us information on the number of students in each category[44].

For the purpose of the model, we are mainly concerned with an entry cohort of students in English institutions. Summaries focusing on the degree type and domicile of students are shown below:

Table 4:

Entry cohort student numbers for England, by degree type, 2006/07

Mode	Degree type	Number of students	Percentage of total
Full-time	First degree	293,869	70%
	Other undergraduate degree	46,235	11%
	PGCE	22,076	5%
Part-time	First degree	13,749	3%
	Other undergraduate degree	45,004	11%
	PGCE	1,544	0%
	Total	422,477	100%

Source: HESA data, CRA calculations

The model also takes into account the domicile of the students as this affects loan eligibility.

Table 5:

Entry cohort student numbers for England, by domicile of student, 2006/07

Mode	Domicile	No. of students	% of total
Full-time	UK	321,531	76%
	Other EU	16,031	4%
	Non-EU	24,618	6%
Part-time	UK	55,307	13%
	Other EU	1,635	0%
	Non-EU	3,354	1%
	Total	422,476	100%

Source: HESA data, CRA calculations

The cross-tabulation, which is the cornerstone of our model, is based on the described HESA data. The cross-tabulation is effectively a partial summary of the HESA data, and includes the following variables which are the key ways to describe a particular student, for the purpose of our model:

- domicile of the student – indicates whether the student is from the UK, elsewhere in the EU, or outside the EU; domicile dictates what fees students are charged, as well as their eligibility for funding support;
- higher education tier – this variable groups higher education institutions into three tiers, providing much flexibility in grouping institutions;
- student gender – whether the student is male or female becomes important when the model generates earnings profiles for each student;
- type of degree – first degree, other undergraduate degree or PGCE. Post-graduate students are not included in that part of the model which analyses earning profiles as a random process;
- course differentiator – we have grouped the 'cost centre' variable in the HESA dataset into three bands, based on how costly the course is[45];
- expected course length – how many years the course is expected to be;
- age bracket and average age – the age bracket variable indicates whether the student is traditional (age 18–21), or non-traditional (age 22–25, 26–40, or over 40); the average age variable is the average age for each type of student within the particular age bracket – important for simulating student earnings profiles;
- parental income proxy variable – the Standard Occupational Classification (SOC2000) from the HESA dataset gives us some information on the occupation of the student's parents and enables the model randomly to generate a parental income from a distribution, which eventually determines the means-tested financial support for the student;
- the number of students is variable depending on which cross-tabulation is summarised.

The result of this is a dataset containing thousands of observations (the actual length depends on how the higher education tiers are defined) – which means it can account for thousands of students based on combinations of the above variables. The cross-tabulation allows us to generate a cumulative probability for each type of student, which dictates the probability of that particular type of student being picked up by our simulation when it is run.

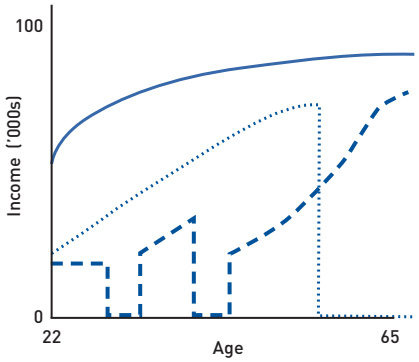
3.2 A micro-simulation based approach

Fundamentally, this is a micro-simulation Monte Carlo-type model. This type of model is used because, in forecasting student financing repayment behaviour, it is the profile of earnings that determines when loans are repaid (rather than the average). For this reason, it is best to model student borrower repayment profiles as a random process and to create multiple sets of students with varying demographic and behavioural characteristics that are representative of the students who have taken out loans (or other sources of finance) – hence capturing reality through a process of simulation.

Figure 3 shows the rationale behind this approach by illustrating hypothetical lifetime earnings profiles for three very different graduate borrowers. While none of these individual borrower's profiles is wholly representative of the typical student borrower, nonetheless, through a process of simulation and aggregating over many thousands of individual profiles, it is possible to build up a representative distribution of the earnings profile for a population of graduate student borrowers, and approximate model repayment behaviour for the entire student population. Student types will be differentiated on the basis of characteristics such as age, gender, qualification type and domicile.

Figure 3:

Three hypothetical lifetime student earnings profiles



Source: CRA analysis

To capture the differences in the repayment behaviour between different types of student repayment profiles we use an established labour market employment model. This develops individual randomly generated income profiles for different student types conditional on socio-economic and behavioural assumptions. Key features of this approach are the way it differentiates between:

- employment state transitions – where different employment paths depend on the individual's characteristics and their previous employment status; and
- individual patterns of growth in real earnings.

When students complete their courses (or drop out), they are assigned an initial employment status which determines whether they enter the labour market following graduation and, if so, in what capacity. Depending what type of degree they have, the model assumes that they are employed (full-time or part-time), unemployed or inactive.

To forecast an individual's lifetime earnings profile it is necessary to estimate the individual's employment behaviour over the course of their working life. We have used the individual borrower's characteristics – age, gender and previous employment state – to estimate the probability of the individual currently being:

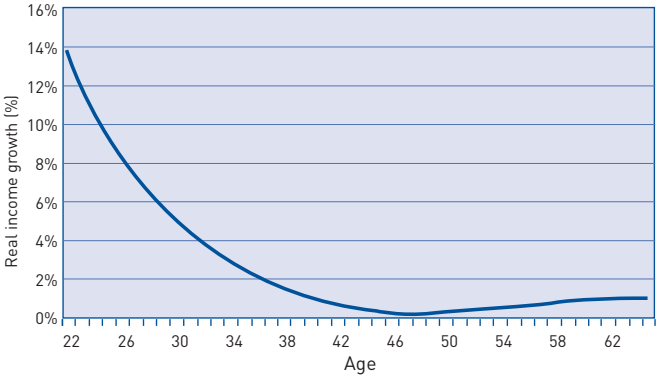
- employed;
- unemployed;
- inactive;
- permanently disabled; or
- dead.

Earnings growth

Studies of individual earnings growth show that earnings rise rapidly immediately after graduation and then the rate of growth declines gradually over the course of the individual's life. We use real earnings growth estimates based on the British Household Panel Survey (BHPS). Figure 4, for instance, shows the hypothetical real earnings growth for a potential male graduate.

Figure 4:

Hypothetical real earnings growth



Source: CRA analysis

We can see that earnings growth effects are greatest at the beginning of a graduate's career, before gradually tailing off and stabilising when an individual is in their mid-40s. Combining the employment transition profiles and real earnings effects for different types of student borrower will enable us to construct the path-dependent lifecycle earnings profiles illustrated in Figure 4 (above).

By capturing all the relevant assumptions for a particular funding scenario, and then matching them with randomly generated earnings profiles repeated over many simulations to reflect the socio-economic and behavioural diversity of different types of student borrowers, the actual cost to borrowers and Government of the different scenarios can be projected.

To get meaningful results the model needs to be run a reasonable number of times. The earnings module is important to calculate the repayment profile and hence the cost to Government. Looking at the results on an institutional basis, the model will take into account the demographics of the institution or the type of institution. However, it will not allow for local labour markets. This will need to be adjusted by the institution.

The results of this module are most important for Government; it is therefore possible to run the model without simulating future labour market income or repayment to Government. This clearly significantly reduces the time taken to run the model.

The model is estimated using recent public survey datasets. It is important to relate this to recent academic studies. For example, Davies and colleagues note that, on the whole, graduates receive a higher wage relative to non-graduates, and university graduates are also more likely to have quality jobs and less likely to experience unemployment[46]. For example:

- the median of lifetime earnings distribution for male graduates is around £325,000 higher than that for male non-graduates;
- among female graduates, the difference is around £430,000.

3.3 Simulating future cohorts

To simulate future cohorts we use the HESA data as a representative sample of a new graduate cohort.

The outputs of the model are scaled up to reflect changes in the aggregate number of students. Student numbers can be generated in two ways:

- deterministic student number inputs into the model; and
- student numbers based on changes in tuition fees and assumed price elasticity of demand (where the price elasticity of demand is assumed to be that suggested in the interviews and literature (as set out in Table 3 above)).

3.4 The impact of the scenarios on institutions in England

The scenarios are applied to the model in a number of ways:

- changes in tuition fees and corresponding changes in loan size are applied to individual student types taking into account their characteristics (for example, length and type of course, whether they drop out, whether they take out available loans) and the type (tier) of institution they attend;
- the number of students in aggregate and for different tiers is determined by the change in the tuition fee using the elasticities discussed above;
- the impact of individual student net income (tuition fee less bursary) is then aggregated to show the impact on institutional finances;
- the repayments based on the graduates' earnings profiles are calculated and the cost to the Government in cash outlay and as subsidy is calculated.

The model allows scenarios to be applied to England as a whole, types of institutions (that we refer to as tiers) and to individual institutions. There are many different ways to categorise the higher education sector and institutions will wish to determine the comparator institutions in their own way.

To reflect this we have made it possible for the tiers to be defined by characteristics of the institution. The model can be set up to define tiers in terms of characteristics that we can link to the higher education identifier within the HESA data. For example, following discussion with Universities UK we have included:

- total home/EU full-time equivalents (FTEs)
- total international FTEs
- total full-time FTEs
- total part-time FTEs
- total undergraduate FTEs
- total postgraduate taught FTEs
- total postgraduate research FTEs
- total HEFCE teaching and research funding
- total HEFCE teaching funding
- total HEFCE research funding
- proportion of low-income students.

For the purposes of the report, the most significant impact on the price elasticity of demand identified in the literature review is the parental income of the potential student's household. To see the impact of the different price elasticities discussed in the literature and the interviews, we have segmented institutions according to the composition of their student bodies.

The model is designed to investigate the financial implications of each scenario for:

- different types of higher education institution;
- students entering into education in the period 2012–16; and
- Government to see the resource and cash implications and the impact on higher education policies.

In this chapter, we set out the results in the base case and for scenarios 1 and 2. The results for the other scenarios are set out in Appendix C.

4.1 The base case

To look at scenarios we need to have a base case. This is the model forecasts for the financial implications of continuing the current regime (as set out in Chapter 1). To do this we model entry cohorts from 2008. So in 2008 we have only first-year students; the model then introduces new students in each subsequent year. As can be seen in Table 6 the result of this is that income builds up quickly in the first three years until the model has reached close to equilibrium, where the number of students entering higher education is similar to the number graduating in the model.

Table 6:
The base case – England only

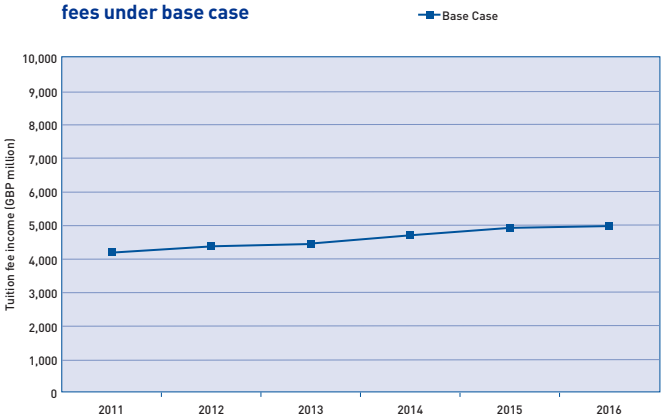
Type of student	Tuition fee income (£ million)			
	2008	2009	2010	2011
UK and EU domiciled students in English institutions	1,133.6	2,057.3	2,930.9	3,223.5
Full-time – undergraduate (first degree)	868.4	1,633.2	2,427.2	2,656.2
Full-time – other undergraduate degree	195.0	322.0	366.2	397.4
Full-time – PGCE	70.2	102.1	137.5	169.9
International				
Full-time – undergraduate	316.9	558.6	847.8	964.2

Source: CRA analysis

By 2011 the model is predicting that (before the new regime) total tuition fee income for English institutions would be around £4.2 billion a year. This is consistent with income today largely uprated by inflation.

This can then be projected for the period 2012–16 to establish the total tuition fee income generated assuming that the existing scheme is maintained. The figures in this report depict tuition fee income starting from 2011, when student numbers reach equilibrium, and ending in 2016, five years from when the new regime is introduced in 2012.

Figure 5:
Forecasted income from tuition fees under base case



Source: CRA Analysis

4.2 Summary of the results of scenarios 1 and 2

To illustrate the outputs of the model, we show the aggregate results of scenario 1 and scenario 2 below.

- Scenario 1 deferred payment – zero real rate of interest loans with income contingent repayments, no means-testing (i.e. the current mechanism) with a cap at £5,000;
- Scenario 2 deferred payment – zero real rate of interest loans with income contingent repayments, no means-testing (i.e. the current mechanism) with a cap at £7,000.

Scenarios 1 and 2: current loan system

Scenarios 1 and 2 are both based on the current loan system, where public loans are available to students at no real rate of interest. Evidence suggests that, at a fee of £5,000, students on the whole remain relatively price insensitive, but if the fee were to rise this would start to influence students' decisions about whether to enrol in higher education.

For each scenario, the model inputs entry cohorts into the higher education system, from 2008 until 2016 – and assumes that the new regime begins in 2012.

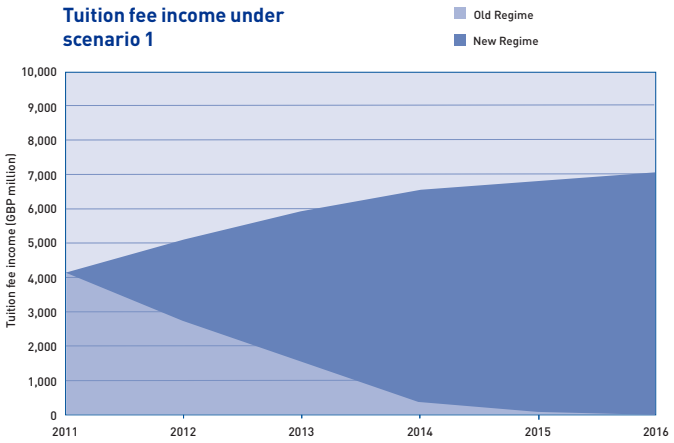
Scenario 1: £5,000 fee

Scenario 1 assumes a fee level of £5,000 starting in 2012, and calculates tuition fee income for higher education institutions accordingly. Since, at this level, we believe that students are largely price insensitive, price elasticity is set to zero, and there is no change in the number of students enrolled in higher education.

Figure 6 below shows the level of total tuition fees under scenario 1. From 2008 to 2011, only the existing regime is in place. However, starting in 2012, the student entry cohort is subject to the new fee of £5,000. Therefore, starting in 2012, the institution receives tuition fee income from both regimes.

Figure 6:

Tuition fee income under scenario 1



Source: CRA analysis

Figure 7 below represents a slightly different snapshot for the same scenario. It shows the total tuition fee income for higher education institutions, comparing total income in scenario 1 to total income under the base case (assuming that the fee remained at the current £3,000 level uprated over time).

Table 7 shows a breakdown of tuition fee income in 2014 by type of student, comparing the base case with scenario 1. As we can see from this table, the tuition fee income rises for students who currently face the cap. For international students where the cap does not apply we assume that price already reflects market reality and it will not be possible to raise this under scenario 1 – hence the income remains the same.

Table 7:

Scenario 1 - breakdown of tuition fee income, 2014 (base case vs. scenario 1), (£ million)

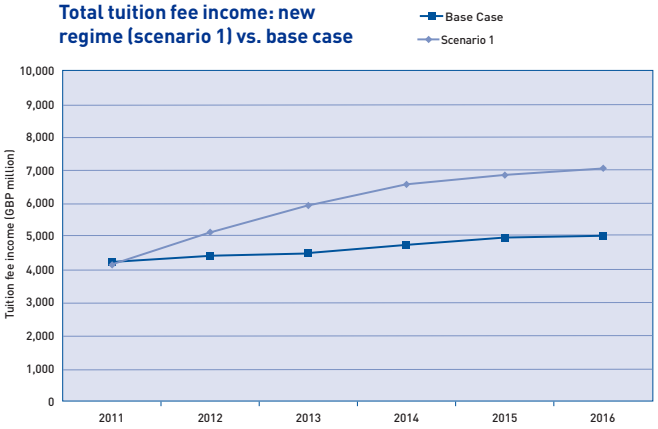
		Base case	Scenario 1
Full-time	Other undergraduate degree	438.71	647.15
	First degree	2,987.51	4,521.67
	Non-EU students	1,084.98	1,081.69
	PGCEs	200.39	286.99
Part-time	First degree	-	-
	Other undergraduate degree	-	-
Total	Total income from tuition fees	4,711.59	6,537.50
	Expenditure on bursaries	1,138.85	1,714.21
	Net income	3,572.74	4,823.29

Source: CRA analysis

Looking at the aggregate difference between scenario 1 and the base case, this would clearly generate a significant increase in income to institutions (but this is the level seen as necessary for them to be sustainable).

Figure 7:

Total tuition fee income: new regime (scenario 1) vs. base case

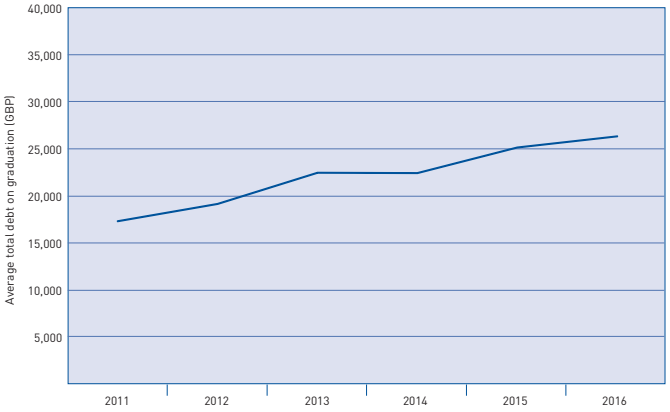


Source: CRA analysis

The model also produces results from the perspective of the graduating students and the Government. The increase in debt on graduation of the increased fee level is shown in Figure 8 below.

Figure 8:

Average total debt on graduation

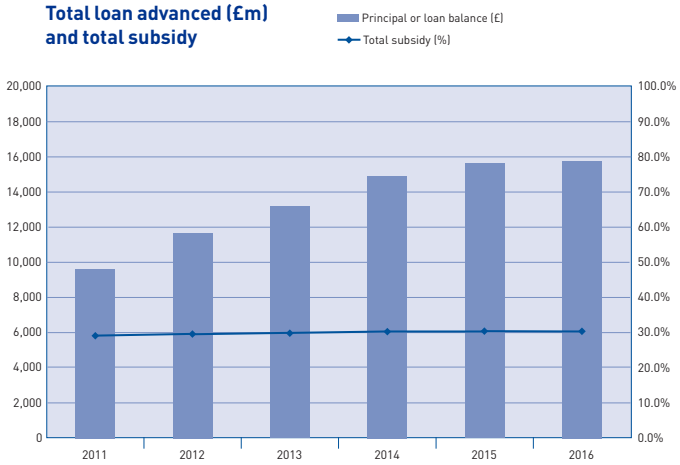


Source: CRA analysis

Equally, the model produces the corresponding impact on the principals that the Government issues and the cost in terms of the percentage of the loan that it will recover taking into account the effect of the subsidy and cancellation. This is shown in Figure 9 below.

Figure 9:

Total loan advanced (£m) and total subsidy



Source: CRA analysis

Scenario 2: £7,000 fee

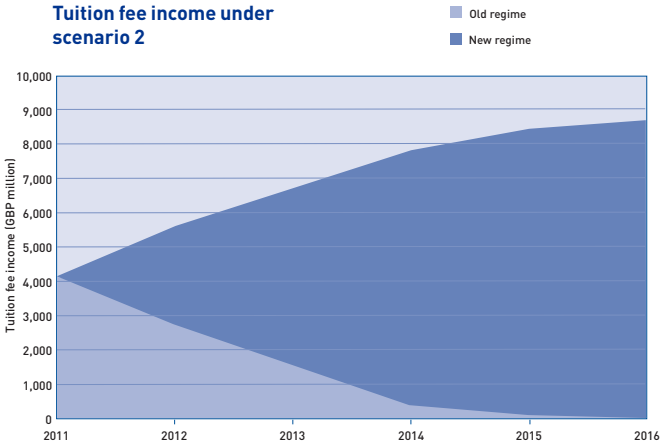
Scenario 2, like scenario 1, is based on the current loan system – however, it assumes a higher fee level of £7,000.

There is evidence that a tuition fee level of £7,000 will make potential students start to change their behaviour and may discourage some from enrolling in higher education. As shown above in Table 3, at this higher fee students from different socio-economic backgrounds will be affected differently, with lower-income potential students being more sensitive to a change in price (elasticity of demand = -0.1) than those from mid/upper parental income households, who remain price insensitive at this level. The increase in the tuition fee therefore reduces student enrolment, affecting some institutions significantly more than others and making the university student population less representative of the wider population.

Figure 10 (like Figure 6 for scenario 1) shows the tuition fee income levels for higher education institutions starting in 2008, showing the proportion of income from students under the old regime, and students under the new regime (tuition fee of £7,000). The new regime element of this figure, therefore, takes into account the increase in fees, but also the decline of student numbers due to price sensitive students at this fee level.

Figure 10:

Tuition fee income under scenario 2



Source: CRA analysis

Again if we compare total tuition fee income for the model to the base case, we can see the additional funds raised by the increase in the cap.

Figure 11 (like Figure 7 for scenario 1) shows tuition fee income for institutions in England, comparing the new regime (£7,000 fee level and price elasticities between 0 and -0.1 for each tier) with the base case scenario where the existing regime remains in place.

Table 8 (like Table 7 for scenario 1) shows the breakdown of the above figure for year 2014, by type of student.

Table 8:

Scenario 2 – breakdown of tuition fee income, 2014 (base case vs. scenario 2), (£ million)

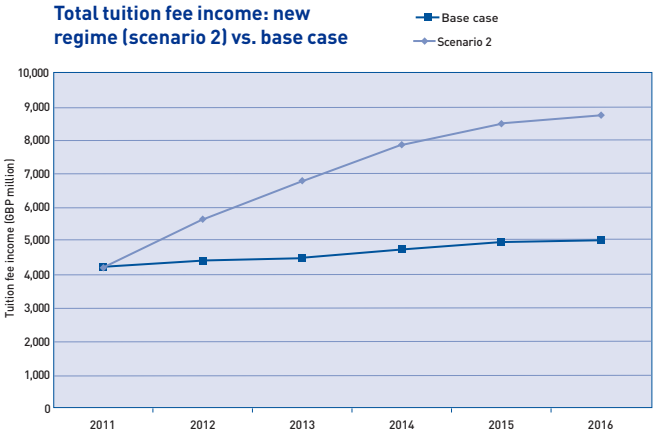
		Base case	Scenario 1
Full-time	Other undergraduate degree	438.71	736.47
	First degree	2,987.51	5,666.96
	Non-EU students	1,084.98	1,074.72
	PGCEs	200.39	357.77
Part-time	First degree	-	-
	Other undergraduate degree	-	-
Total	Total income from tuition fees	4,711.58	7,835.92
	Expenditure on bursaries	1,138.85	2,190.40
	Net income	3,572.74	5,645.52

Source: CRA analysis

Again if we compare total tuition fee income for the model to the base case, we can see the additional funds raised by the increase in the cap.

Figure 11:

Total tuition fee income: new regime (scenario 2) vs. base case



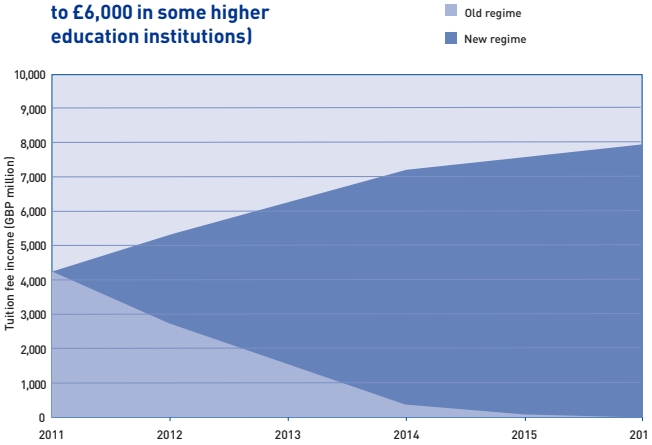
Source: CRA analysis

Incorporating the response of institutions

In practice, not all institutions will increase fees to £7,000. Given the responsiveness of some students, this will result in some institutions charging below the cap (but with different fee levels for different courses). We can model this using the responses from the interviews as to the types of institution that will charge different amounts. The results of this are shown below. (This set of results assumes a fee increase to £7,000 for tier 1 and £6,000 for tiers 2 and 3).

Figure 12:

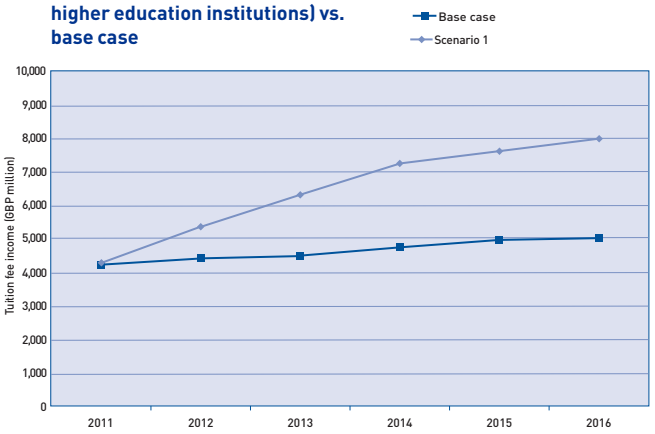
Tuition fee income under scenario 2 (where fee rises only to £6,000 in some higher education institutions)



Source: CRA analysis

Figure 13:

Total tuition fee income: new regime (scenario 2, where fee rises only to £6,000 in some higher education institutions) vs. base case



Source: CRA analysis

Table 9:

Breakdown of tuition fee income, 2014 (base case vs. scenario 2, fee rises only to £6,000 in some higher education institutions), (£ million)

		Base case	Scenario 2
Full-time	Other undergraduate degree	438.71	669.17
	First degree	2,987.51	5,114.01
	Non-EU students	1,084.98	1,099.91
	PGCEs	200.39	323.56
Part-time	First degree	-	-
	Other undergraduate degree	-	-
Total	Total income from tuition fees	4,711.59	7,206.64
	Expenditure on bursaries	1,138.85	1,918.09
	Net income	3,572.74	5,288.56

Source: CRA analysis

4.3 How individual institutions could use the model

Since the intention has been to develop a model for institutions to use for their own planning and financial purposes, we asked the vice-chancellors we interviewed what they would like the model to be capable of and what kind of inputs they would like to be able to vary.

Responses clearly reflected the existing modelling work undertaken by their respective universities on the student markets in which they operate, including competitor behaviour. Some have already invested in sophisticated models that allow them to explore trends and the implications of future policies. Others have so far developed only limited modelling capability. All institutions agreed, however, that the banding of institutions based on the data published by OFFA on the proportion of additional fee income spent on financial support for students and other widening access activities would not be appropriate. Several vice-chancellors felt that the data were potentially misleading and grouping institutions was more generally a very sensitive issue.

Vice-chancellors wanted a range of model outputs and inputs and these have been reflected as far as possible in designing the model. Their key message was the need for a high degree of flexibility in inputs to reflect the student profile of individual institutions. They also wanted to be able to look at the impact of similar scenarios on institutions judged to be their main competitors.

The model has therefore been designed to simulate the impact of different tuition fee policy scenarios that might be considered in the variable fees review for England in 2009. However from the outset the second objective was for the model to be useful for individual institutions in deepening their understanding of the market place.

What can the model do?

The model allows any institution to categorise other institutions into useful comparator groups (or tiers). A group could include only itself or other institutions with similar characteristics. These characteristics can be defined by the user but could include things such as the number of full-time students, the number of international students or the proportion of low-income students. Alternatively the user can simply define the particular institutions it would like to be in a group.

The model uses the characteristics of the institution(s) as included in the HESA data set to calibrate the model. For each of the groups it is possible to set out:

- the tuition fee level and how this varies over time;
- the bursary strategy;
- the sensitivity of students to changes in the tuition fee regime.

The model will simulate the impact on student participation, the revenues for the institution or groups, the average level of debt upon graduation and the cost of the scheme in terms of government financial support.

What the model cannot do

The model has been based on the results of interviews with institutions. It includes assumptions about the responsiveness of students to different fee and maintenance arrangements. When running the model for a particular institution the user needs to consider whether:

- the parameters are appropriate for the institution;
- the parameters are sensible given the policy scenarios under consideration. For example, the responsiveness of students is based on relatively small variations in fees and would alter if very large changes were assumed.

The model is a tool for considering the impact of different policies and as such it should be useful although it is only one factor in the process of arriving at new policies.

Appendix A
Cost centres

Cost centre	Cost centre	Cost band
1	Clinical medicine	1
2	Clinical dentistry	1
3	Veterinary science	1
4	Anatomy and physiology	1
5	Nursing and paramedical studies	1
6	Health and community studies	1
7	Psychology and behavioural sciences	1
8	Pharmacy and pharmacology	1
10	Biosciences	1
11	Chemistry	1
12	Physics	1
13	Agriculture and forestry	2
14	Earth, marine and environmental sciences	2
16	General engineering	2
17	Chemical engineering	2
18	Mineral, metallurgy and materials engineering	2
19	Civil engineering	2
20	Electrical, electronic and computer engineering	2
21	Mechanical, aero and production engineering	2
23	Architecture, built environment and planning	2
24	Mathematics	3
25	Information technology and systems sciences and computer software engineering	3
26	Catering and hospitality management	3
27	Business and management studies	3
28	Geography	3
29	Social studies	3
30	Media studies	3
31	Humanities and language based studies	3
33	Design and creative arts	3
34	Education	3
35	Modern languages	3
37	Archaeology	3
38	Sports science and leisure studies	3
41	Continuing education	3
99	Dummy cost centre - without reporting institution	3

Source: CRA grouping based on HESA data variables

Modelling alternative variable fee scenarios: questions for heads of institution

The aim of this study is to develop a user-friendly model, available to all Universities UK members, to enable them to model their institution's financial position under different possible tuition fee regimes. We wish to discuss the following questions with you under Chatham House rules. Opinions shared with us will be reported only at the sectoral level, and no individual or institution will be named in or identifiable from our report. These questions are to help us consider technical aspects integral to building a fee model appropriate for use by institutions in the longer term. They will also help to inform the assumptions we need to make about the likely behaviour of institutions in response to specific scenarios that might result from the 2009 fees review.

Fee options

1. What level of tuition fee is necessary for the long-term sustainability of your full-time undergraduate teaching programmes?

   (Assume that HEFCE funding is not reduced pro rata to any increase in the tuition fee.)

2. How far would the tuition fee cap need to rise for your institution to consider charging fees below the permitted maximum? At what level might other universities consider charging fees below the maximum?

3. If the fee cap were removed but with limited public support (through fee loans), would your university introduce tuition fees above the maximum supported by public fee loans? Would many other universities introduce higher fees? To what level might fees rise?

   (Assume that higher education institutions would be required to provide generous bursaries or fee waivers for students from low income families.)

4. Some universities already charge lower tuition fees for sub-degree and Foundation Year programmes. Is there any scenario in which your university might contemplate charging different fees for different subjects? What about other institutions?

   If **yes**, would such differentiation be related to relative levels of demand or to underlying cost differences?

Student bursaries

5. How would your institution respond to an increase in the annual maximum tuition fee from £3,000 to £5,000 following the 2009 fees review if the following applied to full-time home and EU undergraduate students:

A. the same student loan arrangements and student support package as now?

B. the student loan repayment terms changed from zero real interest as now to a real rate of interest on part/all of the loan?

C. public funds available for students were capped at £3,000 (for fee loans) and institutions were expected to make additional bursary support or fee waivers available to students who were unable to meet the additional costs themselves?

6. Are bursaries serving their intended purpose? How might bursaries develop in the future? Would a partial fee waiver system be more effective in sustaining demand from students from low income families?

Model design issues (outputs/inputs)

7. Have you investigated for your institution the likely impact on student demand of debt on graduation?

   If **yes**, what level of tuition fee (and **total** potential debt on graduation) might significantly reduce student applications? Would this affect the types of courses you offer?

8. Should we band institutions according to the proportion of additional fee income they spend on bursaries and other widening access activities?

   A recent report by the Office for Fair Access (01/08) has provided this information on an institution by institution basis for 2006/07.

9. Will the demographic decline in the number of 18-20 year olds from 2010 have an impact on institutions' decisions on setting tuition fees? Should the potential impact of demographic decline be a major element in the prospective 2009 review?

10. What model outputs would your institution find helpful for its strategic planning and other purposes?

11. The two main elements in the model cover graduate earning profiles and loan/fee parameters. The model will provide the opportunity for institutions to vary parameters to reflect their own circumstances. What parameters would you wish to be able to flex in this way?

Appendix C
Scenario results

Figure 14:

Scenario 1: Deferred payment: zero real interest rate (current income contingent loan), £5,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	432,309	432,309	432,309	432,309	432,309
Institutions						
Income from tuition fees (£)	4,187,723,758	4,957,026,958	5,738,407,334	6,440,615,950	6,826,577,279	7,117,848,937
Other undergraduate degree	397,413,734	489,287,427	605,328,484	606,420,299	657,997,263	642,391,856
First degree	2,656,198,918	3,319,473,399	3,921,551,932	4,543,853,366	4,793,072,272	5,012,983,213
Non-EU students	964,194,704	911,097,634	941,345,916	990,310,011	1,031,369,433	1,108,770,780
PGCEs	169,916,401	237,168,498	270,181,001	300,032,273	344,138,311	353,703,086
Expenditure on bursaries	1,017,424,372	1,283,392,048	1,519,893,470	1,750,373,202	1,850,990,620	1,906,122,942
Students						
Average total debt at graduation (£)	17,248	19,119	22,483	22,447	25,206	26,412
Government						
Value of new principal advanced (£)	7,540,348,671	8,362,818,407	9,306,011,208	10,091,949,260	11,300,404,461	10,863,625,501
Total subsidy (%)	26.9%	27.5%	27.5%	28.0%	27.9%	27.8%

Source: CRA International

Figure 15:

Scenario 2: Deferred payment: zero real interest rate (current income contingent loan), £7,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	402,431	402,431	402,431	402,431	402,431
Institutions						
Income from tuition fees (£)	4,259,517,780	5,654,328,231	6,855,837,264	7,938,557,063	8,438,106,032	8,743,261,673
Other undergraduate degree	412,390,757	545,461,927	719,619,089	766,467,358	779,142,634	852,998,166
First degree	2,667,435,555	3,813,490,466	4,747,432,155	5,723,242,942	6,180,071,502	6,273,659,510
Non-EU students	1,010,770,718	1,025,344,859	1,065,408,352	1,073,360,546	1,060,217,130	1,182,375,553
PGCEs	168,920,750	270,030,979	323,377,668	375,486,217	418,674,766	434,228,444
Expenditure on bursaries	1,021,907,751	1,498,105,232	1,874,450,434	2,240,740,743	2,399,996,762	2,487,773,227
Students						
Average total debt at graduation (£)	17,092	19,712	21,855	23,453	29,056	32,462
Government						
Value of new principal advanced (£)	7,480,348,710	8,454,666,058	9,872,300,854	11,069,354,506	12,316,582,075	12,072,191,206
Total subsidy (%)	26.8%	27.7%	29.1%	29.9%	30.6%	30.3%

Source: CRA International

Figure 16:
Scenario 3: Upfront payment: means-tested public support, £5,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	432,309	432,309	432,309	432,309	432,309
Institutions						
Income from tuition fees (£)	4,187,723,758	4,957,026,958	5,738,407,334	6,440,615,950	6,826,577,279	7,117,848,937
Other undergraduate degree	397,413,734	489,287,427	605,328,484	606,420,299	657,997,263	642,391,856
First degree	2,656,198,918	3,319,473,399	3,921,551,932	4,543,853,366	4,793,072,272	5,012,983,213
Non-EU students	964,194,704	911,097,634	941,345,916	990,310,011	1,031,369,433	1,108,770,780
PGCEs	169,916,401	237,168,498	270,181,001	300,032,273	344,138,311	353,703,086
Expenditure on bursaries	1,017,424,372	1,283,392,048	1,519,893,470	1,750,373,202	1,850,990,620	1,906,122,942
Students						
Average total debt at graduation (£)	16,600	18,396	21,423	21,065	21,706	21,829
Government						
Value of new principal advanced (£)	7,285,597,197	8,091,199,421	8,461,030,276	8,741,228,904	9,451,696,849	8,705,958,641
Total subsidy (%)	26.4%	26.7%	26.3%	26.4%	26.1%	25.9%

Source: CRA International

Figure 17:

Scenario 4: Upfront payment: means-tested public support, £7,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	432,309	432,309	432,309	432,309	432,309
Institutions						
Income from tuition fees (£)	4,271,892,940	5,869,465,576	7,281,387,609	8,581,417,634	9,132,391,460	9,478,081,690
Other undergraduate degree	429,416,423	570,858,114	749,905,275	820,118,561	831,374,986	907,087,884
First degree	2,661,137,648	4,001,910,801	5,121,472,561	6,273,234,814	6,784,081,415	6,916,020,442
Non-EU students	1,013,819,605	1,011,021,684	1,068,399,735	1,080,087,166	1,053,946,679	1,178,193,717
PGCEs	167,519,264	285,674,977	341,610,039	407,977,093	462,988,380	476,779,648
Expenditure on bursaries	1,023,956,934	1,567,903,005	2,011,180,105	2,426,778,824	2,633,525,918	2,728,327,861
Students						
Average total debt at graduation (£)	16,585	19,141	20,064	21,165	22,637	23,342
Government						
Value of new principal advanced (£)	7,224,132,342	8,066,253,860	8,618,566,352	9,189,053,607	9,715,355,768	8,777,329,697
Total subsidy (%)	26.1%	26.1%	26.3%	26.3%	26.3%	26.3%

Source: CRA International

Figure 18:

Scenario 5: Deferred payment: real interest rate (no means-testing), £5,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	432,309	432,309	432,309	432,309	432,309
Institutions						
Income from tuition fees (£)	4,177,951,517	5,086,452,387	5,789,246,240	6,550,354,854	6,894,583,905	7,129,942,032
Other undergraduate degree	362,165,107	501,873,605	586,111,035	633,315,412	642,196,426	634,534,797
First degree	2,654,817,339	3,361,893,015	3,928,008,408	4,510,576,878	4,834,109,947	5,017,151,722
Non-EU students	988,396,076	989,717,322	1,012,264,697	1,116,246,460	1,089,469,317	1,123,790,214
PGCEs	172,572,995	232,968,445	262,862,100	290,216,104	328,808,215	354,465,299
Expenditure on bursaries	1,033,954,073	1,304,286,287	1,521,863,838	1,754,660,899	1,859,390,293	1,918,669,445
Students						
Average total debt at graduation (£)	16,591	20,315	21,964	22,605	26,829	28,570
Government						
Value of new principal advanced (£)	7,520,326,892	8,500,714,227	9,524,042,088	10,223,743,999	11,496,157,039	10,790,448,635
Total subsidy (%)	22.8%	19.9%	16.5%	14.2%	12.7%	13.0%

Source: CRA International

Figure 19:

Scenario 6: Deferred payment: real interest rate (no means-testing), £7,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	402,431	402,431	402,431	402,431	402,431
Institutions						
Income from tuition fees (£)	4,173,841,406	5,601,009,455	6,745,133,344	7,887,933,384	8,399,633,172	8,724,835,046
Other undergraduate degree	410,833,164	553,238,309	709,079,497	801,271,128	751,333,639	813,826,346
First degree	2,612,709,551	3,786,414,459	4,711,155,079	5,700,219,595	6,119,995,427	6,284,010,486
Non-EU students	985,735,535	1,010,111,106	1,026,688,410	1,031,186,526	1,115,175,404	1,183,795,697
PGCEs	164,563,155	251,245,582	298,210,358	355,256,136	413,128,701	443,202,517
Expenditure on bursaries	1,012,081,404	1,445,172,988	1,783,769,398	2,181,749,674	2,325,532,179	2,381,802,203
Students						
Average total debt at graduation (£)	17,794	18,485	21,933	23,198	29,908	32,557
Government						
Value of new principal advanced (£)	7,284,203,919	8,233,185,247	9,808,923,653	10,813,108,182	11,871,181,923	11,842,354,846
Total subsidy (%)	22.3%	20.2%	18.9%	17.3%	17.1%	17.1%

Source: CRA International

Figure 20:
Scenario 7: Capped interest-free loans: private loans with real interest rate, £5,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	432,309	432,309	432,309	432,309	432,309
Institutions						
Income from tuition fees (£)	4,255,198,308	5,023,071,250	5,732,436,273	6,559,758,831	6,849,469,688	7,130,007,237
Other undergraduate degree	401,798,715	522,534,841	581,577,098	633,052,221	609,218,370	662,944,359
First degree	2,681,330,261	3,313,257,310	3,922,389,929	4,566,895,418	4,860,293,436	5,001,047,985
Non-EU students	991,469,110	948,299,423	970,898,648	1,069,185,519	1,059,637,786	1,128,896,993
PGCEs	180,600,222	238,979,676	257,570,599	290,625,673	320,320,096	337,117,899
Expenditure on bursaries	1,030,637,294	1,303,321,753	1,536,305,952	1,790,008,432	1,855,615,416	1,887,760,827
Students						
Average total debt at graduation (£)	17,016	19,834	22,000	23,004	26,196	27,437
Government						
Value of new principal advanced (£)	7,590,349,773	8,516,043,792	9,570,060,703	10,409,392,968	11,152,031,958	10,445,945,978
Total subsidy (%)	23.3%	20.5%	17.2%	14.2%	12.6%	12.7%

Source: CRA International

Figure 21:
Scenario 8: Capped interest-free loans: private loans with real interest rate, £7,000 fee level

	2011	2012	2013	2014	2015	2016
Total students (FTE) entry cohort	432,309	332,606	332,606	332,606	332,606	332,606
Institutions						
Income from tuition fees (£)	4,200,594,168	5,068,786,349	5,726,449,686	6,460,620,595	6,733,579,197	6,951,137,354
Other undergraduate degree	398,905,577	509,017,908	623,882,349	687,202,611	647,735,075	679,685,212
First degree	2,675,806,644	3,327,438,225	3,870,840,672	4,472,085,997	4,663,344,488	4,780,720,167
Non-EU students	954,292,850	1,007,615,995	979,440,346	1,021,005,067	1,094,425,513	1,153,417,066
PGCEs	171,589,096	224,714,221	252,286,318	280,326,921	328,074,121	337,314,909
Expenditure on bursaries	1,020,311,970	1,281,549,596	1,485,403,027	1,713,018,859	1,777,067,907	1,846,718,617
Students						
Average total debt at graduation (£)	16,478	20,061	23,090	23,974	29,451	32,045
Government						
Value of new principal advanced (£)	7,660,219,845	8,629,961,351	9,370,508,491	9,757,066,184	10,264,403,920	9,814,120,772
Total subsidy (%)	23.3%	20.9%	19.0%	16.9%	16.7%	16.5%

Source: CRA International

Notes

1 The model has been set up to be as flexible as possible. This includes running scenarios where the application of a real rate of interest is based on means-testing or institutions charge differential fees by course. However, the results from these scenarios are not set out in this report.

2 Although the current model focuses on full-time students, the underlying data provided by HESA includes part-time students and the model has been designed so that it could relatively easily be extended to include part-time students.

3 Section 26(2) b of the Higher Education Act 2004 requires that the annual increase is no greater than is required to maintain the value (of the fee) in real terms. Under Section 26(3) of the Act, the Secretary of State is to have regard to such index of prices as may be specified in or determined in accordance with Regulations made by him/her under this sub-section. The actual increases have been 2.3 per cent for 2007/08 and 2.4 per cent for 2008/09.

4 For students aged over 25, it is based on their own household income. Parental income is considered for students aged under 25 on entry.

5 About 75 per cent of the maximum student loan for maintenance is non-income-assessed and can be borrowed by all students. Whether or not they are entitled to borrow the remaining 25 per cent, the income-assessed element, depends on household income.

6 There is no formal commitment to raising the amount of the repayment threshold. It last increased from £10,000 to £15,000 in 2006.

7 The variability in the amount an institution spends on bursaries depends on the proportion of additional income each university sets aside for bursaries (depending on need and ability) and also the take-up of bursaries. OFFA's report on experience of the first year of operation of this system notes that most institutions overestimated outreach expenditure. See OFFA (2008), *Access agreement monitoring: outcomes for 2006-07*. As indicated in sections below, many institutions offer bursaries on a means-tested basis of considerably more than the minimum requirement.

8 The model has been designed so that longer time horizons can be easily included.

9 See, for example, the National Committee of Inquiry into Higher Education (1997), known as the Dearing Report. See also the Cubie Report into tuition fees in Scotland *(Cubie et al (1999) Student finance: fairness for the future)* and the Taylor report (Universities UK (2001) *New directions for higher education funding: funding options review group final report.*

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43 The Higher Education Statistics Agency (HESA) is the official agency for the collection, analysis and dissemination of quantitative information about higher education in the UK – it integrates statistical data collection across all publicly funded UK higher education institutions.

44 The number of students in the dataset is not exactly a headcount of students in each category. Rather, as described on HESA's website, it 'represents the institution's best academic judgement of the full-time equivalence of the student'. For example, a part-time student, or a student studying the equivalent of a three year course over five years, would appear as a fraction of a number.

45 For information on grouping of this variable, see Appendix A.

46 Davies (2008), op.cit.

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