Income Contingent Tuition Fees for Universities

Neil Shephard
University of Oxford

Introduction

The UK Government has a large structural budget deficit. Whichever party wins the next General Election, it is clear that it will either cut the real value of Government spending or at least have very modest real growth rates. Higher education will be a tempting target for salami slicing 'efficiency gains'. Indeed, the slice of roughly 1% was announced on 13th May 2009 by the Higher Education Funding Council of England (HEFCE). From July 2009 HEFCE has been consulting on a further 1.2% reduction which they may introduce in 2010-2011[1]. Given the state of the public finances my guess is that eventually the Government will require reductions of the order of 10-20% in the real value of their various contributions to the tuition chargeable by universities. In the long run this will threaten the quality of English undergraduate education, which could in turn inflict lasting damage on one of the UK's most successful sectors - a sector that also generates a large volume of exports[2]. This will likely make the UK poorer, economically and culturally, in the future.

Some university leaders have suggested that student tuition fees, funded through 'income contingent loans' supplied by the Government, should rise to make up for any shortfalls in underfunded teaching costs[3]. Rather surprisingly, under the current funding model, an increase in the level of tuition fees in fact increases public sector debt. I will explain why and what might be done about this to mitigate the rise in national debt. The most important mitigation is to remove the interest rate subsidy graduates receive on their tuition loans. Barr (2004) has demonstrated that this subsidy is very expensive and an inefficient way of providing financial support to higher education students. I entirely agree

with him that it should be removed.

In this note I will argue that the UK Government should go further. I think the Government should allow universities to charge their graduating students additional fees if their teaching costs are not met by the current total tuition payment of around £7,000 per year per student[4]. I will call these 'income contingent tuition fees.' Income contingent tuition fees are additional teaching fees due to the university. They can be paid to the student's university either

i. Optionally upfront by the parents of the student;
ii. By the graduate once his/her income rises above a defined threshold and once their national maintenance and tuition loans are repaid.

Given the state of the public finances my guess is that eventually the Government will require reductions of the order of 10-20% in the real value of their various contributions to the tuition chargeable by universities. In the long run this will threaten the quality of English undergraduate education.

If the graduate's income is not sufficient to make the repayments during their career the fee is forgiven. Note the university is not given extra upfront cash (above the existing £7,000) by the state or the Student Loan Company. This means that such fees are neutral on the fiscal position of the state, the size of the Student Loan Company's loan book and the financial position of the universities which do not introduce such fees.

The structure of my note is as follows. I discuss the current financial model used to fund undergraduate teaching in England. I discuss the financial implications

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1   HEFCE publications 2009/17 and 2009/25.

2   Throughout I will discuss solely English universities. However, the same type of structure is broadly in place in Wales and Northern Ireland and also applies to English students who study at Scottish universities.

3   For example, in March 2009 Sir Roy Anderson, Rector of Imperial College, advocated the tuition fee cap should rise to between £6,000 and £9,000. For typical universities this would mean their average total income via tuition per EU student would move from around £7,000 to be between £10,000 to £13,000 per year. It will become clear how one computes these numbers shortly.

4   Throughout I will discuss per student numbers. To put this in context the Higher Education Statistics Agency (HESA) reported in 2007/2008 that there were almost exactly one million full time and half a million part time students in English higher education. Of these just under 91,000 are from outside the EU (presumably they are full-time students) and about 54,000 from the non-UK EU. The corresponding full time numbers for Wales, Scotland and Northern Ireland are 66,000, 123,000 and 30,000, respectively.

for the state and universities. I then outline the implications of Nick Barr's argument for the removal of the rate subsidy embedded in the current tuition and maintenance loans and the implication for the government's loan book. I then argue that once this is done it is possible to introduce variable income contingent tuition fees. I discuss the implications for fee caps, charitable giving and student debt. I then draw some conclusions, followed by a section on policy recommendations. The paper finishes with an Appendix which uses some data from the Institute of Fiscal Studies to model the distributional implication of income contingent tuition fees and to estimate the payment stream which would result to universities.

The poor fiscal implications of increasing tuition fees

Two groups make payments to universities to cover the costs of educating EU based undergraduates at English universities; the UK Government and, indirectly, graduates. It is important to understand the nature of each contribution.

Universities receive directly from the state a 'grant' for each EU undergraduate student each year[5]. The level of the grant varies over four price subject groups developed by HEFCE to reflect average costs at UK universities and used by them since 2004/2005. These groups act as multiples (A=4, B=1.7, C=1.3, D=1; an example of a subject in group A is Clinical Medicine, D includes Humanities and Social Studies) on a base price of £3,964 in 2008-2009. Then there is an ad hoc reduction of £1,200 applied to each tuition grant. So for example, a student in Clinical Medicine attracts a grant of £14,656, while one in economics produces £2,764. So the average state income per student varies across universities, depending upon their subject mix. At Oxford University, for example, in 2008-2009 the average state grant per student was £4,705. This is a little above the sector average as Oxford has a higher than average percentage of science students[6]. London based institutions receive a special uplift on their base price.

Universities have a second form of income per student. This is a £3,225 flat 'tuition fee' per year paid by the graduating student, whatever they study (universities can choose to charge a smaller tuition fee but do not, universities are not allowed to charge more than £3,225). I will explain how this is financed in a moment, but for now I want to focus on it from a university's perspective. Some of this £3,225 additional income must be dedicated to maintenance support for students

from low income families. At Oxford University in 2008-2009, for example, this averages £650 per student per year[7]. Hence over the entire student body the 'net tuition fee' received per student per year is around £2,575.

So for Oxford, combining the state grant per student (£4,705) and the net tuition fee (£2,575) the total net average income per EU student per year is about £7,280. This final figure is a little above the sector average, universities with few scientists having average incomes nearer £6,000. But the variation in income between English universities is modest.

How are the £3,225 per year tuition fees financed? Currently many parents pay the fees up front as a gift to their children[8]. This case is easy to analyse economically and so I will ignore it here and focus on the bulk of students where there is no prepayment.

English students have no need to pay their £3,225 per year tuition fee until they graduate. Instead the state provides an **income contingent loan** to the student (which I will explain in a moment) arranged through the 'Student Loan Company' in order to pay the university. In practice the money goes from the state to the university and the student inherits an income contingent debt on graduating.

The loan[9] is only repaid by the graduate through the taxation system if their gross yearly income goes above £15K[10]. The loan is forgiven after 25 years or at the death of the graduate if sooner. Currently the repayment rate is 9% of income above £15k. The interest rate charged is the rate of growth in the Retail Price Index. This means that the state provides two forms of financial support for these £3,225 per year tuition fee loans:

i. Insurance. The state takes on the graduate's financial (i.e. default) risk of borrowing to fund their tuition. Many people regard this as an excellent feature of the scheme[11].

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5 The economic rationale for providing students with a subsidy is that their education benefits not just each individual but society more generally (i.e. educating an individual generates positive externalities for others). If there was no subsidy then collectively the student body may then invest insufficiently in their education, damaging each one of them and society.

6 This number ignores any effect of the funding provided to universities with historic buildings (which Oxford benefits from). HEFCE is currently consulting on removing this type of funding and it is irrelevant to our sector wide discussions and so I have decided to not include it here. I have used Oxford as an example as their administrators were kind enough to give me precise figures, which helps my writing.

7 This is agreed with the "Office for Fair Access." At Oxford in 2008/2009 it covered 30% of new entrants.

8 I estimate that about 30% of English students are having their tuition fees paid upfront, while the corresponding number is around 60% for non-UK EU students. These are very rough estimates and are based on the following. The current system of income contingent tuition loans has been running since 2006/200 so is approaching its steady state. Table 4B and 4C of the Student Loan Company's "Statistics Release 05/2008" suggests in 2008/2009 around 650,000 students took out income contingent tuition loans to study at English universities, of these about 20,000 were from the EU. The average amount loaned was £3,000 a year, that is nearly the entire amount. The SLC's statistics indicate a higher take up of maintenance loans of around 80%. In a single year the total borrowed for tuition loans is around £2B and for maintenance about £2.5B.

9 On the same basis students can also receive income contingent loans for their maintenance costs. These are repaid first. Then the tuition loans are repaid. Thus the maintenance loan is the "senior" loan and the tuition loan the "junior" one. I will ignore maintenance loans for now and return to them later in a section on student financial support. I do this as maintenance loans have no direct impact on the finances of universities.

10 The SLC has reciprocal agreements with many countries so it can follow graduates if they leave the UK.

11 The economic justification for making loans income contingent is based on insurance due to the high uncertainty students have about the economic return on their education. It was developed by Friedman (1955). See Barr (2004) and Krueger and Bowen (1993) for extensive discussion of the subsequent literature.

Table 1 Financial analysis of different types of funding models

	Current	Current + increase in fees	Barr's proposal	Barr + Anderson's increase in fees
State grant	£4,705	£4,705	£4,705	£4,705
Face value of senior tuition fee	£3,225	£3,225	£3,225	£3,225
Face value of junior tuition fee	0	£2,775	0	£2,775
Face value of all tuition fees	£3,225	£6,000	£3,225	£6,000
Maintenance bursaries	-£650	-£650	-£650	-£650
Average net univ fees income	£2,575	£5,350	£2,575	£5,350
Financial position of university				
University's income	£7,280	£10,055	£7,280	£10,055
Financial position of state				
Size of tuition fee loan book	£3,225	£6,000	£3,225	£6,000
Long run Insurance subsidy	£535	£1,000	£535	£1,000
Long run Rate Subsidy	£1,075	£2,000	0	0
Long run cost of tuition	£6,315	£7,705	£5,240	£5,705

Note: Barr's reform is the removal of the interest Rate Subsidy. Increase in fees to a new cap of £6,000, following Anderson.

ii. Rate subsidy. The state charges interest below base rate, which is the standard price the UK Government can borrow at. This is much more contentious.

These two forms of support mean that these are not pure student-held loans; the state funds part of the real cost of the tuition loan. The scale of this support can be seen from the net present value to the Government of £1 of a graduate debt. Currently, according to Barr (2004, p. 278), this is about 50p - very roughly split 33/66 between the two categories of Insurance and Rate subsidy.

Thus the financial implications of this scheme for the Government are, per student, per year:
i. Loan book increases by £3,225;
ii. Long run loss due to Insurance is about £535;
iii. Long run loss due to Rate Subsidy is about £1,075. The overall loss is about £1,610.

If student fees increase as a number of leading universities want, this will inflate the loan book and in the long run cost the Government money, i.e. 50% of any increase in fees. Furthermore, this additional Government spending (to cover the long run losses) will be directed predominantly to the universities which set the largest fees, which is not a good public welfare outcome.

This is illustrated in the first two columns of Table 1 using an increase in fees of £2,775 (a figure taken from the low end of Professor Anderson's suggestion) to illustrate the point. Here 'senior tuition fee' (£3,225) is the current tuition fee paid by graduates and the 'junior tuition fee' (£2,775) is any increase in these fees. This junior/senior distinction becomes important later.

The Government could shrink the loan book by selling on the open market the future income stream the SLC gets from a tranche of student loans as some students pay off their loans. Selling this kind of asset backed security on the open market has become both harder to carry out and less rewarding following the collapse of the mortgage based asset backed security market in the last couple of years. What is certain is that the private sector will demand a risk premium for it, which could lead to larger losses than the 50% dis-

cussed above. We will come back to this issue in Section 4 when I interpret 'income contingent tuition fees' in a particular way.

Given the above calculus it seems difficult to see how the UK Government can now afford to either increase its grants or allow student fees to increase markedly.

The best current option: Barr's approach

Some latitude could be obtained by following Barr (2004) who argued the state should remove the Rate Subsidy (on the grounds of both fairness and efficiency) by charging at base rate[12]. This seems to have wide support amongst academic economists as Rate Subsidies are a very inefficient and regressive way for the state to provide a subsidy to students (see Barr (2004), Barr and Johnston (2009) or Appendix A2). Barr's proposal removes much of the state's losses on the student loans. It leads to a reduction in the Government's long-run total tuition costs by around 17% (see Table 1 above) without affecting the income universities receive[13]. Importantly it would also shrink

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12 During 1949-2008 the average base rate was 6.97% and RPI inflation was 5.76%. The spread is 1.2% for the post-war period, while for 1976-2008 the spread was 2.86%. So an attractive alternative is to charge inflation plus two per cent, which perhaps modestly reduces the individual graduates' risk compared to charging base rate. Real weekly wages grew yearly at 2.3% on average from 1949-2004, although average real hourly wages only grew at 1.8%. These quantities are derived from Castle and Hendry (2009). This policy of removing the Rate Subsidy was also advocated by Laidlaw (2009) in the CBI higher education report.

13 Barr has argued that another option is to increase the interest rate to above base rate. One per cent above base rate would approximately make student loans fiscally neutral, although it would not shrink the loan book. This change would reduce long-run public spending on tuition by 25% and remove the costs on maintenance loans. There is a danger that if the interest rate gets above a commercial rate then students who are very confident about their financial future will opt out of the state system eventually undermining the Insurance aspect of the scheme (this is classic adverse selection). This is thought to have happened in the first income contingent scheme which was introduced by Yale University in 1971. See, for example, Krueger and Bowen (1993). I have a lot of sympathy with this viewpoint and would suggest it would be prudent to not allow interest rates to go above base rate in the long run.

the state's long-run maintenance costs by around 66%. It leads to no short term costs to the state[14].

Unfortunately Barr's approach does not shrink the loan book, which constrains the state's ability to increase the fee cap from the current £3,225. Again this is shown in Table 1.

With Barr's proposal the size of the loan book rapidly increases as fees increase. The initial tranche of £3,225, the senior fees tranche, is joined by a junior fee tranche of £2,775, making the total loan book worth £6,000. If the Government can easily sell the loan book to the private sector (and avoiding a knock down price) then this would not be a problem. But this is tricky at the moment and will always be done at a large commercial premium (probably 1-2% above base rate each year). The situation is worse if the fee cap were to go to £9,000, the high end of Professor Anderson's suggestion.

> **Some latitude could be obtained by following Barr (2004) who argued the state should remove the Rate Subsidy (on the grounds of both fairness and efficiency) by charging at base rate. This seems to have wide support amongst academic economists as Rate Subsidies are a very inefficient and regressive way for the state to provide a subsidy to students.**

My suggestion provides a variation on the Barr proposal that avoids the problem with the loan book. Universities can be thought of as providing the natural owner of the junior tranche of the tuition fee loan book building on the existing national scheme for the senior tranche.

A new proposal: income contingent tuition fees

A conventional introduction

Universities should be given the right to charge a second form of fee: an income contingent tuition fee . The fees can be paid to the university in two ways

   i. Optionally upfront by the parents of the student;
   ii. By the graduate once his/her income rises above a defined threshold and once their national maintenance and national tuition loans are repaid.

The bulk of students will go through route ii. They pay

nothing up front but as the graduates become wealthy they pay their fees and this is collected by the SLC who pass it on to the university[15]. I will discuss how the level of these additional fees might be set in a moment.

Universities should be given the right to charge a second form of fee: an income contingent tuition fee.

As fees would vary across the university sector, it would make sense for the income streams each university receives to correspond to the repayments its graduates make. If this is not the case then universities will have a financial incentive to increase their fees (and so have very substantial face values of junior tranches of debt) and then claim large fractions of repayments made by students at all English universities. This is a classic free rider problem.

As a person working at a university I find the university owning the loan attractive. The university would be investing (i.e., teaching without demanding upfront payment) in the future prosperity of its graduates, while looking after those that do not have high future incomes. This reduces the risk of graduates who have invested in high quality education. The summary might be: 'A university should teach now, its graduates should pay it if and when they can afford it[16]'.

Table 2 works through a numerical example reported in the column labelled 'My suggestion' and compares it to the current situation and what happens under Barr's reform with an increase in tuition fees. It shows that increasing fees under my suggestion is fiscally neutral for the state and has no impact on the size of the loan book.

This concludes the main point of my note. The rest of this note will argue:

- This suggestion is easy and cheap to implement and is compatible with universities being charities;
- Universities will have incentives to charge lower fees under this scheme than if the national fees cap was simply increased;
- The only graduates who will end up paying these fees will have average or above average graduate

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14 Withers (2009) suggested that the income contingent loan facility might be withdrawn from students of wealthy parents. This reduces losses and the size of the loan. Krueger and Bowen (1993) support this viewpoint, while Laidlaw (2009) had some aspects of this. This would be a new principle in the UK and if the Rate Subsidy was fixed would not save that much money in the long-run. Further it would break the link between the cost of education and the personal return and give discretion to wealthy parents about if they will "send" their children to higher education or not, which seems undesirable.

15 It is entirely possible for this junior fee to have different repayment schedules than the established senior student loans of 9% of income over £15,000. It could then have a progressive structure, which has attracted the support of the National Union of Students in their discussions of student loans (they prefer a graduate tax, a permanent increase in income tax on all people who go to university. Economically this is identical to saying income contingent fees should be infinitely large, which is quite a high price. Further, graduate taxes strongly encourage financially confident students to seek higher education outside the UK).

16 The above scheme has some similarities to the US system of pure loans. However the proposed scheme here still has the loans being income contingent, so there is nothing to pay if the students do not earn very much. The US system has unconditional loans, placing all the risk on the student (with some scholarships at a few wealthy universities, where the size of the scholarship is a function of the measured ability to pay of the student's parents). In any case, removing income contingency would be extremely contentious politically, opening up many new issues not previously discussed in the UK.

Table 2 Financial analysis of different types of funding models

	Current	Barr + Anderson's increase in fees	My suggestion
State grant	£4,705	£4,705	£4,705
Face value of senior tuition fee	£3,225	£3,225	£3,225
Face value of junior tuition fee	0	£2,775	£2,775
Face value of all tuition fees	£3,225	£6,000	£6,000
Maintenance bursaries	-£650	-£650	-£650
Average net univ fees income	£2,575	£5,350	£5,350
Financial position of university			
University's upfront income	£7,280	£10,055	£7,280
Size of junior tranche	0	0	£2,775
Long run Insurance subsidy	0	0	-£460
Long run revenue	£7,280	£10,055	£9,595
Financial position of state			
Size of tuition fee loan book	£3,225	£6,000	£3,225
Long run Insurance subsidy	£535	£1,000	£535
Long run Rate Subsidy	£1,075	0	0
Long run cost of tuition	£6,315	£5,705	£5,240

Note: Barr's reform is the removal of the interest Rate Subsidy. Increase in fees follows Anderson's suggestion of the cap rising to £6,000. "My suggestion" is the introduction of income contingent tuition fees, discussed in the next section.

earnings, so income contingent tuition fees are highly progressive.
* This suggestion aligns the university's and student's incentives to fundraise to support existing and future students.

For those with an impatient disposition who trust me in making those claims can now skip forward to the conclusion, while those who wish to see the points justified can read on.

A view from finance

This scheme has a simple financial interpretation, which means it is easy to implement.

I propose any substantial fee increase is not paid upfront to the university by the state when the student's income contingent debt is increased at the SLC. Instead the university is paid by being given ownership of the new income stream from these junior student tuition loans administered by the SLC[17]. So instead of getting extra upfront payments by the state as fees increase the university gets ownership of the junior tranche of student debt corresponding to the increase in fees. Financially this means it is given a 25 year bond rather than cash[18].

17 Currently many parents pay upfront all or part of the university tuition fees of their children. Such payments would immediately go to redeem the senior tuition loan, followed by the junior tuition fee. As the junior tuition fees are paid, the university would be given the money immediately. Through this early repayment route some tuition loans and fees can be repaid before the maintenance loan is repaid.

18 Think of this as follows. Suppose the additional fee is £2,775. Then the above is the same as the following: i) The state gives the university £2,775 cash and the student takes on £2,775 debt at the SLC; ii) SLC sells the collateralised debt of £2,775 to the university at the price of £2,775; iii) SLC gives the £2,775 back to the state. All three transactions can happen simultaneously or, in reality, just netted out so the university does not see the upfront cash. Of course the university would have preferred to have not been made to buy the debt and instead just be given the cash, but I do not think this is now fiscally feasible for the UK state.

The result is
i. The SLC's loan book is unchanged;
ii. The university owns the income stream from the new income contingent loan: it has no debts;
iii. The fiscal position of the state is unchanged;
iv. The student has a larger income contingent loan. Repayments go to the Government until the senior loan is paid off, then the repayments go to the university. Hence the university owns the junior tuition fee tranche and the state the senior fee tranche of the student tuition fee loan.

High leverage means that small losses can spell insolvency. Widespread losses on subprime mortgages, for example, will cause interbank markets to freeze and create intense pressure to scramble back onto *terra firma* by deleveraging.

This is important for it means these new fees leave entirely unaltered the properties of the senior tuition loans of the national scheme including the insurance pooling across the university sector on the senior debt. Hence allowing, for example, the LSE to charge such fees has no financial implication for the state or, for example, Plymouth University.

Note that the SLC has sold asset backed securities in the past, so no new legal issues arise.

The level of fees

Once the state no longer has an incentive to depress fees, it may be possible to allow the income contingent tuition fees to increase taking the overall fees beyond the current cap of £3,225. My hope would be that these

new fees would be flexible, allowing each university and its students to set the level of fees which is suitable for it. With new fees and the elapse of time universities should have an established income stream coming directly from its own graduates through their income contingent fees[19].

> **The only people affected by a university being allowed to have a junior income contingent tuition fee of z are the university and its students. But the state should have an interest in avoiding students being exploited**

To discuss plausible fee structures I will write x to denote the value of the state's humanities and social studies tuition grant of £2,746 (the HEFCE grant supports the costs of more expensive subjects and it is attractive for students to face the same cost for different subjects at the same university. Humanities almost always have the lowest international tuition fees at UK universities) and y to denote the current national fee cap of £3,225. The only people affected by a university being allowed to have a junior income contingent tuition fee of z are the university and its students. But the state should have an interest in avoiding students being exploited . This suggests the state may sensibly insist that a non-negative z cannot push x+y+z above the minimum of three benchmarks:

i. The tuition fee for non-EU students studying humanities and social science subjects at that university[20]. Of course this means the EU students will themselves pay less than overseas students as the state and university pays part of their costs in the form of
  a. A state tuition grant;
  b. All of their fees being income contingent.
ii. Average long-run full economic cost of humanities and social studies undergraduate tuition at the university (so the university does not make a profit on undergraduate provision). A first round estimate of this are the TRAC(T) calculations prepared for HEFCE, but those calculations can be improved upon.
iii. A sector wide cap on x+y+z of, following Roy Anderson's upper level, £2,746+£9,000 =

£11,746 which cannot be breached by any university. This can be altered through time as universities secure the trust of their students and alumni and competition between universities becomes more intense.

Presumably the level of these new fees would need to be agreed with the Office of Fair Access to ensure that each university charging such fees has sensible access policies in place.

Which universities would introduce an income contingent tuition fee?

As mentioned earlier, the current level of income from teaching EU undergraduates at Oxford is around £7,280, which is modestly above average due to Oxford's higher number of science students. HEFCE estimates[21] that in 2006/07 the higher education sector as a whole lost around 5% on EU undergraduate teaching. 5% of £7,280 is roughly £360. So for most universities there is little evidence that fees need to rise and using my rules from the previous section many institutions would not qualify to charge income contingent tuition fees. After all they do not need the money for this purpose.

However, within the English sector a small number of universities run their undergraduate education programs at significant loss[22]. These universities have higher cost bases due to their use of small group teaching and research-led teaching. For them, introducing an income contingent tuition fee may be attractive as it may plug this funding gap in the long run. It will also create a new income stream which is not dependent on the state, so increasing academic independence.

The deficit on undergraduate education is typically funded from other sources. At Oxford mainly comes from diverted research income (principally so called QR income from HEFCE), surpluses generated by its publishing department Oxford University Press, income from various general endowments and tuition on taught masters courses. At some other universities overseas undergraduate students are now sometimes charged above average costs and this income is used to support EU students. Of course, in the long-run, extreme versions of this profit making on overseas students may damage the sector's international reputation, as will diverting money earmarked for research.

The above discussion contrasts with the behaviour of US private competitors who come much closer to breaking even on undergraduate education and use their endowments to invest in graduate education and, in particular, research. These research powerhouses have enormous positive technological spinoffs which partially stimulate the US economy (e.g., Stanford, MIT). On

19 In fiscally difficult times, the Government may decide to start scaling back its own block teaching grant to those universities with high junior tuition fee income streams. It might focus its limited funding on the universities which are not self-sustaining and/or on directly supporting students (not universities) who study subjects it particularly favours (e.g. STEM subjects). In the limit, there may be universities with high levels of fees which receive no state grants for undergraduate teaching, which we might label "Foundation universities", while those which do have state funding might be called "State universities". This echoes the US model (but based on income contingent loans) and the development of some aspects of the public sector in the UK in the last 30 years.

20 If overseas fees are put up too high then the university will risk losing high quality students due to international competition. This puts some market discipline on university fee setting.

21 HEFCE's letter 2008/14, Table 1, column 1. This is based on the so-called "Transparency Review" (TRAC) method. Of course estimating such costs is challenging.

22 E.g. in April 2009 the vice-Chancellor of Oxford University, Dr John Hood, reported to a select committee of the House of Commons that some internal university calculations, which include the teaching costs of its Colleges , suggest in effect an over 100% loss on income. This is clearly an extreme example in the sector.

Table 3 Collective financial support for students, to meet the costs of the education

	Cost of education	Gift from the UK taxpayers	Income contingent support for the student's education
State scholarship (HEFCE grant)		£4,705	
National loan			£3,225
University income cont fee			£2,775
Total	£10,705	£4,705	£6,000

Note: The undergraduate costs are taken as: £4,705 + £3,225 + £2,775 = £10,705. This is the lower end of Professor Roy Anderson's suggestion.

the other hand, the successful research based US state universities typically have relatively small and regulated fees and very large undergraduate classes, so driving down their per student costs to sustainable levels (e.g., Berkeley, Michigan). Quite a lot of EU countries have similar models, but based on even lower fees which tend hardly to vary between universities. The US sector has a substantial number of liberal arts colleges which have their focus nearly entirely on providing excellent small group undergraduate education (e.g., Swarthmore, Amherst). They can survive as they can charge higher fees. In the English system these types of universities cannot develop due to the national fee cap.

Incentives and the fee cap

Universities currently determine the level of senior tuition fees up to a maximum of £3,225, yielding a total average income per student of around £7,000 per student per year. In practice now all universities selected the maximum fee. This clustering is interesting; why does it happen?

> US private competitors come much closer to breaking even on under graduate education and use their endowments to invest in graduate education and, in particular, research (e.g., Stanford, MIT). The successful research–based US state universities typically have relatively small and regulated fees and very large under-graduate classes, so driving down their per student costs to sustainable levels (e.g., Berkeley, Michigan).

It could be that this is because all universities run their teaching at significant losses. But there does not appear to be any significant evidence that this is true. It could be that each university feels that the demand for its places is rather inelastic (i.e., demand will not fall very much as fees increase) as a function of tuition fees. This could be because the average graduate only pays half the long-run cost of the fees or that some students regard the level of fees as a signal of the quality of the course. Of course whatever the fee, up to the level of the cap, the university will get their declared fee in cash up front from the state, even if its students cannot

afford to repay the state's loan during their career. So the university will gain from high fees and the university's students will not lose much due to the state's subsidy. Hence universities have a strong positive incentive to have higher fees and students have a very weak incentive to select another university to try to lower their fees.

This suggests that if the state were to increase the current senior fee cap of £3,225 nearly all universities would set their fees at the senior fee cap, unless the cap is increased very significantly (which is surely unlikely).

If on the other hand we had additional junior income contingent tuition fees, then the university will only get additional income if their students become wealthy in the future. If fees become unaffordable the university will not get any income anyway, so having high fees is pointless and off-putting for some potential students. This creates a proper incentive for universities to charge lower fees; so not all fees will jump to any junior fee cap. Instead there will be more variety, more reflecting the actual costs faced by each individual university to educate its students in the manner it and its students think best. Further, the state's subsidies to graduates will not go to the universities with the highest fees, a rather strange feature of the current scheme. Instead each English graduate will receive the same national subsidy; a tuition grant and state income contingent loan for maintenance and national tuition. This seems fairer to students.

Level of graduate debt and payment

There is substantial evidence that the average return on investing in higher education continues to be high for most UK students, particularly in subjects outside the humanities. Throughout I have used income contingent fees as the basis of funding undergraduate teaching. Table 3 provides a summary of student support in the case where the university has a junior income contingent fee (I would hope a number of universities would add a fourth contribution to the list given in the Table: a gift from alumni).

A large share of graduate debt is currently produced by maintenance costs and so, for example, an increase in tuition fees at a minority of universities will increase average debt levels by a relatively modest amount. We would expect that both higher fee paying universities and the state would want some of the extra revenues to be used to provide extensive subsidies to poorer students.

Maintenance loans vary according to parental income,

Table 4 Simple illustration of the role of seniority in repayment of the loans & fees

	Per year	Debts & outstanding fees at graduation	Duration of repayments in years by annual graduate income		
			£20,000	£30,000	£50,000
Maintenance loans	£4,000	£12,000	£11,250 only	8.9	3.8
National income contingent loans	£3,225	£9,675	None	16.1	6.9
Income contingent tuition fees	£2,775	£8,325	None	22.0	9.5
Total	£10,000	£30,000			

Note: Maintenance is repaid, then the national fees and only then the new income contingent fees. Note the graduate with income of £20,000 is only able to repay £11,250 of the maintenance allowance and none of the contingent loans & fees. This Table assumes the current repayment rate of 9% of income above the £15,000 income threshold.

if the student is living at home, etc. They are worth up to £4,950 per year per student. Hoareau (2008) reports a higher percentage of students take out maintenance loans (80%) than tuition loans and their average face value (£3,730 in 2006) is higher. In my example below I will assume the maintenance loan is £4,000 per student per year.

Table 4 shows repayments and payments of first the maintenance loan, then the national income contingent tuition loan, and finally the university's income contingent tuition fee. It shows this based on different levels of starting income which I assume grows at a constant 2% real through time (equalising out the base rate applied to the repayments, so they can be ignored). The table records the duration, in years, until each part is repaid. As the income level increases the repayments are paid off more quickly. If the income level is low then they are forgiven after 25 years and I record the amount repaid.

A simple interpretation of Table 4 is that a university will see little upside[23] in introducing the new income contingent tuition fees unless their students have subsequently financially successful careers. It also emphasises that these new fees should incentivise universities to help to keep down their maintenance costs (as maintenance loans need to be repaid first before the other fees), which is not the case with the current system. It also shows that the universities with such fees will not see a great deal of uplift in their income for quite a long time, although the fact that quite a large number of parents pay the current tuition fees of their children upfront will deliver some immediate help.

Using realistic data, Appendix A3 identifies which groups of students would end up paying the fees and when, as well as providing an estimate of the income the scheme would generate for universities. It shows the new fees are highly progressive, with only financially successful graduates actually paying any additional fees[24].

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23 As I noted earlier, in reality many parents pay in full up-front the tuition fees of their children. This may provide an immediate new income source for the university.

24 If fees were raised current students would seemingly not benefit from the resulting better facilities in the future, which would seem unfair. However, that is not the correct way of thinking about it as fees would only rise if universities were losing money on undergraduate provision. Universities cannot forever continue to lose money without damaging their ability to educate students in the future. Hence it would be unfair to future students for the current students not to pay more.

Fees and charities

English universities are registered charities and as such have a limited ability to make loans. In the above discussion I have sometimes used the traditional language of discussing fees and student loans. This might therefore seem as if the universities will be making massive loans to their students.

Table 4 emphasises that the new income contingent tuition fees should incentivise universities to help to keep down their maintenance costs (as maintenance loans need to be repaid first before the other fees), which is not the case with the current system.

But in reality as the income contingent loan is owned by the university to pay itself, it is not really a standard loan at all. Certainly it does not cause the university to have any debt. It is more properly described economically as an 'income contingent tuition fee', paid to the university over the life time of the graduate if and when the individual graduate can afford it[25].

As a charity, each university has to demonstrate their activities deliver public benefit, which I take to mean that students should have access to the university irrespective of means and that undergraduate teaching is not carried out at a profit. My proposal is built from those principles.

In recent years, a very small number of leading UK universities have significantly increased their philanthropic fund-raising from alumni[26] and industry. Under my scheme the funds from such sources could be used as scholarships to partially pay up front some of the junior income contingent tuition fees. This will benefit both students and the university. The benefit to the student is obvious; the size of their remaining fees will be lower. The university also benefits as they will not have to provide the Insurance and any Rate Subsidy, as well as receiving the cash earlier.

At the moment philanthropic fund raising to support

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25 I am grateful to Ewan McKendrick, PVC for education at Oxford, for informally consulting a leading charities lawyer to confirm this interpretation.

26 This has been encouraged in the UK by the introduction of tax-effective giving through "gift aid" in 1990, which has been expanded by successive governments.

students is largely indirect; it provides better facilities and some bursaries for students from poorer backgrounds. One of the reasons for this is that, as the national fees are paid upfront to the university by the state, universities do not gain themselves if they find a donor to pay the fees for the students (which is the simplest form of philanthropic gift – directly paying for someone's education). With income contingent tuition fees the interests of the students and university are aligned to fundraise to pay the fees of the students.

The introduction of junior income contingent fees at certain universities may affect the willingness of wealthy alumni to give to universities later in their life. I can anticipate two additional competing effects: (i) by allowing fees to more accurately reflect and inform alumni and students of the true high cost of providing the education, alumni (like the university itself) will be keen to help others who are challenged by facing these costs, (ii) by making the fees reflect costs alumni may regard universities more like commercial organisations and this could reduce their willingness to make charitable contributions to them. I have had some colleagues argue point (i) and others worry about point (ii). Point (ii) reinforces what I think is a crucial point, that if fees are liberalised each university must demonstrate it does not profit in the long-run from the provision of undergraduate education and the total fees cannot rise above the level charged to overseas students.

Conclusion

The financial position of the UK Government suggests that our highly successful university sector may have its funding squeezed. One way of helping universities is to allow tuition fees to rise. Unfortunately at present this will lead to an increase in public expenditure. The effect of this can be reduced by Barr's suggestion of removing the interest rate subsidy, which is an ineffective and regressive way of spending public money on supporting students in higher education. Even this leaves a problem. Although it reduces the cost to the Government of increasing fees, the Student Loan Company's loan book would expand dramatically as fees increase. At the moment it is hard to sell off the loan book without significant discounts, again increasing the cost of higher education.

I propose that universities that wish to significantly increase their fees be allowed to do this, but their payment not be made upfront by the state, as it is now. Instead the payment should be made in the form of them owning the corresponding income stream from this junior tranche of student debt. This would mean that increasing fees would have no impact on the SLC's loan book nor the Government's fiscal position. This would deliver a new income stream for universities, independent of the state and directly related to the future financial success of their own students . Appendix A shows the fees are very progressive, with students having below average graduate earnings not paying the fees at all.

Policy summary

I think the Government should do the following:
  i. **Continue to provide a state tuition grant for each student.** Write the average tuition grant student per year as x (e.g. £4,705 in Oxford). The Government should protect the level of this grant as much as it can, given its own fiscal position.
  ii. **Remove the rate subsidy on both tuition and maintenance loans.** In the long-run this reform would save the state around 17% of total tuition costs and 66% of maintenance costs. This also reduces the long-run cost to the state of increasing the fee cap, written y (currently £3,225), on the senior national tuition fees. However, the cost is still important and it does significantly increase the size of the loan book. In my view it is very difficult to see how the state can afford to increase the senior fee cap much beyond inflation during the next parliament.
  iii. Allow **universities to charge an additional junior income contingent tuition fee** of z. This does not cost the state anything and can be collected through the SLC. Universities only receive the income if their students become wealthy after they graduate. It makes sense to also make a junior cap on x+y+z designed for each university (not just a sector wide flat cap). I spelt out above how this might be designed.

Although the headline figure of x+y+z may be high, it reflects the costs universities face in educating undergraduates. The graduate debt of y+z will be income contingent. The university will not receive all of x+y+z because of the Insurance subsidy on z as well as it using some of its resources from y+z supporting students from poorer backgrounds.

Note that universities charging junior income contingent tuition fees will have to wait to receive a substantial additional income flow. The fee will only start to be paid after the state's maintenance loan is first paid off, followed by the state's senior tuition loan. It will be unrealistic to believe that even for Russell Group type universities they would receive the peak income flow until 10 years after the students graduate. Such universities should still be keen on this scheme as
  i. They have no other viable solution given the fiscal position;
  ii. It would be an outstanding prize to be able to finally put the financial position of undergraduate education on a long term footing in England;
  iii. It provides universities with more independence from the state and strengthens the link between them and the future of their students.

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Appendix: impact of income contingent tuition fees

Modelling approach: earnings paths

It is useful to try to model more accurately the effect of income contingent tuition fees. Who will pay them and when will the universities who charge them receive the money? We answer this using methods developed by the Institute of Fiscal Studies and documented by Dearden, Fitzsimons, Goodman and Kaplan (2008). These methods are employed by Barr and Johnston (2009) in their analysis of the current national tuition fee scheme.

The Dearden, Fitzsimons, Goodman and Kaplan (2008) approach is based on tracking real earnings using the 1993-2003 Labour Force Surveys. Our analysis will be based on simulated earning paths of 20,000 university graduates (10,000 men & women) constructed by the IFS. To make the analysis a little easier Alison Johnston has summarised the raw data in the following form which I use. The individuals were sorted into five groups according to life time earnings: bottom 20%, fourth, middle, second and top 20%. Within each of these lifetime quintiles, each year after graduation, the mean was computed. When plotted through time this gives us five earning paths, which are drawn on the left hand side of Figure A1.

The picture of real earnings, drawn on a log scale, shows growth and increasing inequality with maturity. As the graduates age their incomes typically go up but in the lowest quintile this is not the case presumably because of the impact of raising children. An important aspect is how fast graduate incomes rise in the upper quintiles. Note that the second quintile has quite a high level of average income (they are paying the higher rate of income tax) at the end of the 25 year period, but early on in their careers their incomes are not that high.

The right hand side of Figure A1 shows the repayments to the state's maintenance and student loans as a function of the quintiles and years since graduating.

The loans are assumed to be for £20,235.18, which is the best estimate of Barr and Johnston (2009) of a typical loan at the moment, based on average tuition and maintenance loans taken out from the SLC, together with a correction for inflation. Here we assume the Rate Subsidy has been abolished and so repayments are deflated by a real interest rate of 2%. Repayments are, of course, 9% on incomes above £15,000 (the threshold is assumed to inflate with inflation).

The picture shows that graduates with low life time incomes repay a small percentage of their loans, while as earnings rise the repayments are made more rapidly. Students who have less life time earnings pay back their loans mostly when their incomes have risen with maturity, not in their first few years of employment.

Why the Rate Subsidy is highly regressive: Barr's reform

Using the above setup it is straightforward to see the impact of the Rate Subsidy on different graduates and on the amount all graduates repay to the state. The left hand side of Figure A2 repeats Figure A1 but now shows a declining value of the amount the state wants repaid due to the Rate Subsidy of a zero real interest rate. The decline is 2% a year, which over 25 years has a substantial impact. The subsidy simply hastens the time when graduates stop repaying the loans (it does not change the amount people repay month by month while they are repaying it). The time the payment stops is shown as when the declining think dotted line representing the discounted value of the loan intersects with the lines representing rising real incomes. We can see the lowest earners do not benefit at all from the rate subsidy. Hence this subsidy is highly regressive. All the other students receive a subsidy of between £4,000-£6,000. It is an extremely odd public policy to focus the available subsidy away from those students who need the money the most.

The right hand side compares the cumulative percentage repayment under the current system and after Barr's

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Figure A.1
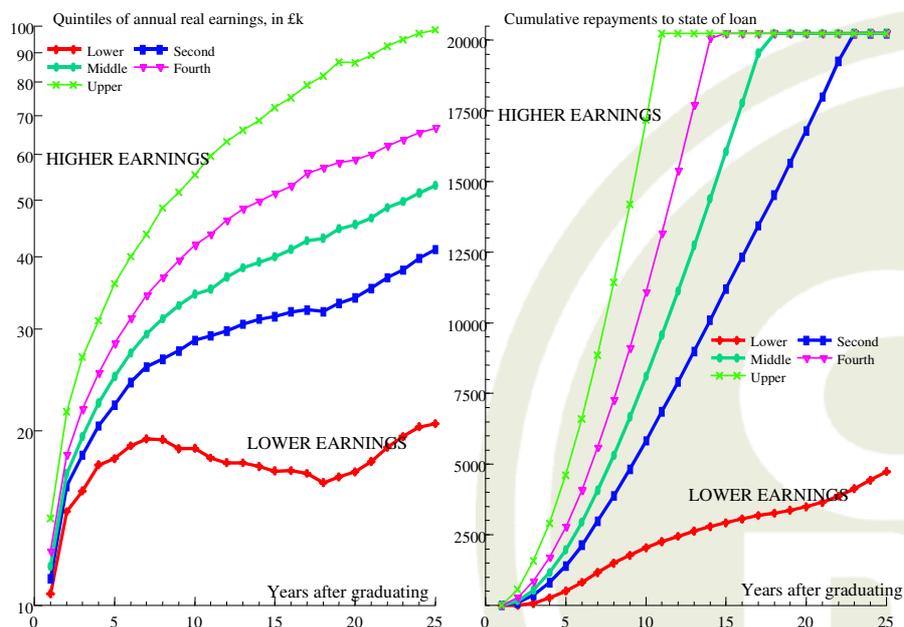
Notes: Based on Johnston and Barr (2009). Left hand side shows profiles of real earnings against years after graduating. Right hand side assumes a loan of £20,235.18 from the state and shows who pays back the loans, computed assuming the Rate Subsidy is removed.

Figure A.2
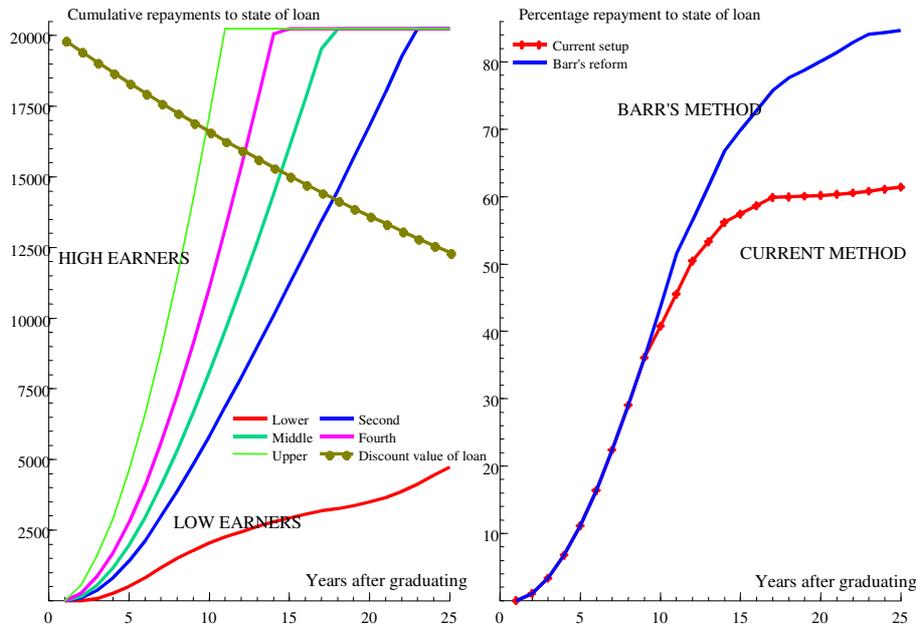
Notes: Based on the analysis of Johnston and Barr (2009). Left hand side, impact of Rate Subsidy. Right hand side: repayment to the state under the current method and under Barr's reform.

Figure A.3
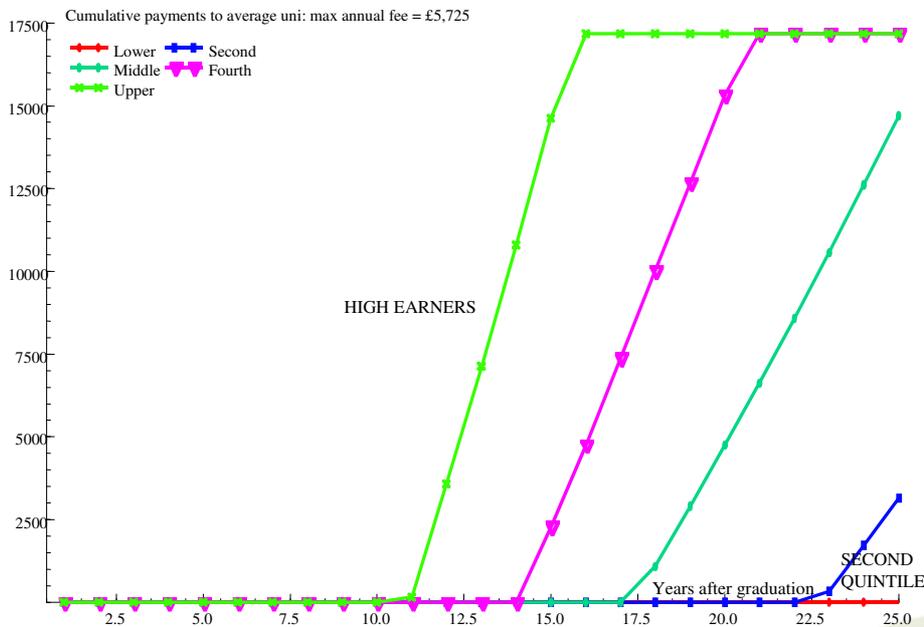
Notes: Payments of the income contingent tuition fees by life time earnings quintiles, graphed against years since graduating. Nothing is paid by those in the lowest quintile.

adjustment. We see the total loan subsidy from the state is reduced by about 50% under Barr's scheme (40% subsidy down to a 20% subsidy). Notice graduates pay the state nothing more under Barr's system until 10 years after they graduate. All of this analysis is simply reproducing results in Barr and Johnston (2009).

Who pays income contingent tuition fees?

Income contingent tuition fees are fees set by the university and paid back by its own graduates if they can afford them. They are junior to the national loans for maintenance and tuition. Hence they are only paid back after the national loan of £20,235.18 is repaid. Throughout I will assume Barr's reform of removing the Rate Subsidy has already been introduced.

Figure A3 repeats the Figure A2 but now the repayments are to the university, not to the state. It shows the results for these new fees up to £5,725 a year, which

is the upper level of Professor Anderson's suggestion. The results for smaller fees can be read off the picture by just putting in a horizontal line at three times the designated fee level.

With additional fees at £5,725 per year, low lifetime graduate earners do not pay any of these fees, and the second quintile pays back around £3,000 of the approximately £17,000 fees. Middle earners pay back nearly £15,000 while top and the second quintile earners pay back all of the fees. Hence these fees are strongly progressive. The payments to the university are almost all made at times when these graduates have incomes in the higher income tax bracket.

The higher the fees the more the high earners are paying as a percentage for the total education of all of the students at that university. So high income contingent fees are progressive. This is the model used by wealthy US private universities except the US system is based on

Figure A.4
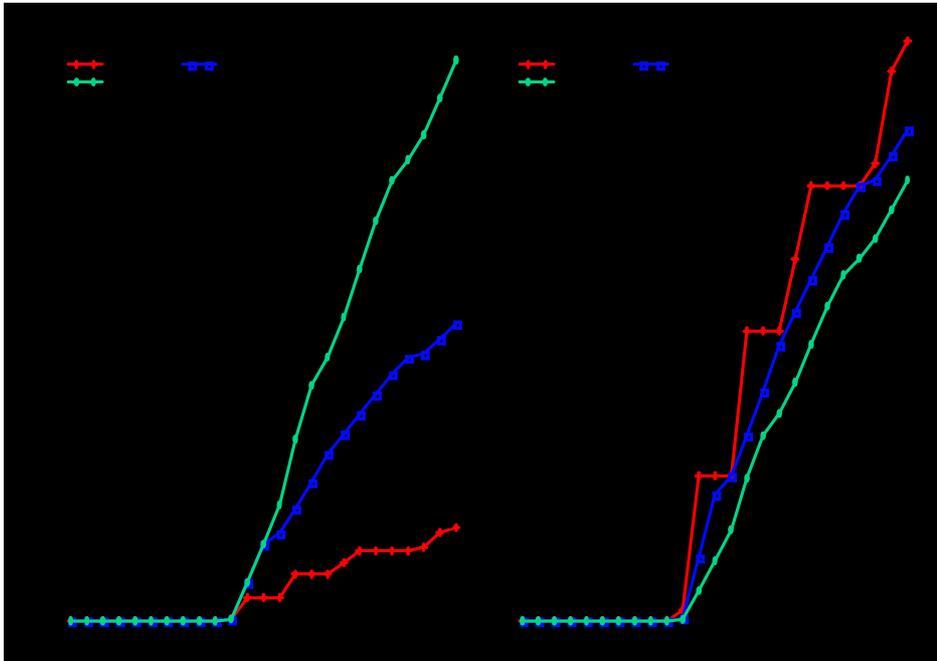
Notes: Payment rates for different fee levels at an average university, whose students have the sector wide profile of earners. As the fee level rises the university receives more income but the percentage of payments falls from 80% for low fee levels to 60% for high fee levels. The payments start arriving only after 10 years since graduation.

parental income, with high fees for students of parents the university judges well off.

Figure A4 shows the length of time it takes for the university to be paid. On these calculations university income will only start to arrive in year 10 and peak around year 16. Of course many parents pay tuition fees up front and so universities would gain some short term income from this, which does not appear in the above calculations. However, it emphasises that these kind of fees provide a long-run solution to the funding problem of universities, not a short-term fix. Put another way, which is the attractive side of the same observation, graduates will not start paying this extra fee for 10 years until after graduation unless their parents pay it upfront.

Importantly, income from such fees goes to the student's university. Different universities will produce students with different levels of life time earnings, and so an individual university's income path will depend upon the success of its students. One might expect, for example, Russell Group universities to have a high percentage of their students in the first quintile and so would benefit from such fees. However, this is entirely dependent on the future success of their graduates, rather than any administrative assessment of the quality of the university.

Neil Shephard is Professor of Economics at the University of Oxford, Professorial Fellow of Nuffield College and Director of the Oxford-Man Institute. He is a Fellow of the British Academy and the Econometric Society.

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