Interest subsidies on student loans: A better class of drain

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Executive summary

1. The British system of student loans has a zero real rate of interest, less than it costs the government to borrow the money. This paper demonstrates that this blanket subsidy is profoundly mistaken, being costly both in fiscal and in policy terms. Instead, the interest rate should be based on the government's cost of borrowing, with targeted subsidies for low earners.

2. With a conventional loan (that is, one with fixed monthly repayments and a fixed duration) an interest subsidy reduces monthly repayments. But student loans in Britain have income-contingent repayments, that is, repayments calculated as a fraction of the graduate's monthly earnings; and any loan that has not been repaid after 25 years is forgiven. In such a system the only effect of an interest subsidy is to reduce the duration of repayments – for example, turning what is, in effect, a 12-year graduate tax into a 10-year graduate tax.

3. After discussion in the opening section of the broader context, section 2 explains why blanket interest subsidies achieve not a single desirable objective. A zero real rate:

- *Is enormously expensive*: about one-third of all money lent to students – approximately 10 per cent of public spending on higher education – is never repaid just because of the interest subsidy;
- *Impedes quality and quantity*: student support, being politically salient, crowds out the funding of universities; and more recently, fiscal pressures, of which the cost of the interest subsidy is part, have led to a shortage of places in higher education;
- *Impedes access*: loans are expensive, therefore rationed and therefore too small for full-time undergraduates, and with no loans for part-time students or postgraduates;
- *Is deeply regressive*: students do not benefit from the interest subsidy, since they make no loan repayments. Low-earning graduates receive no benefit being protected by income contingency and, for those with low lifetime earnings, by 25-year forgiveness. High-earning graduates with low earnings early in their career are also protected by income contingent repayments. The main beneficiaries are successful professionals in mid career, whose earnings are high enough to repay their loan in full, for example repaying for (say) 11 years, rather than (say) 12 years with a higher interest rate.

4. The empirical evidence (see Figure 1) shows that the 25-year write-off is highly progressive and benefits women particularly. In contrast, the interest subsidy mainly benefits better-off graduates.

5. Section 3 models different ways of addressing the problem. Our estimates are based on data on graduate real salary paths, generously provided by the Institute for Fiscal Studies, comprising simulated annual earnings for 20,000 individuals (10,000 men and 10,000 women) each year from age 22 to 60, together with their cumulative lifetime earnings over those years, and assuming an outstanding loan at graduation of £20,235. We estimate the likely range of savings, and consider the distributional effects across quintiles of graduate earners.

6. There are two strategic approaches to reducing the subsidy: higher monthly repayments, or a longer duration of repayments. The various options are set out in Tables 1-4. Each option has a moderate variant and, to provide a stress test, a more radical variant.

- We rule out the present system, which is expensive, inimical to quality, quantity and access, and regressive.

- Option 1: higher monthly repayments: this option yields potential savings, but mostly from graduates in the lowest quintile, so the overall impact is regressive.
- Option 2: a higher interest rate with full protection against any rise in a person's real outstanding loan balance: this option protects the bottom quintile, but the middle and upper quintiles keep some of their subsidy.
- Option 3: a repayment extension: this approach fully protects the lowest quintile and induces the most cost savings. Extending repayment by two years compared with the current system (Option 3a) reclaims about 60 per cent of the current subsidy; the top quintile overpay by 10.1 per cent (we place a cap on overpayment of 25 per cent of the value of each person's loan), but the middle quintile retain some of their subsidy. The latter problem can be rectified by a repayment extension of 3 years, but only at the expense of extracting an overpayment of nearly 20 per cent from the top quintile.
- Option 4: a positive real interest rate with real debt allowed to rise for the first 5 years: this option reclaims nearly 45 per cent of the current subsidy; the bottom quintile is fully protected; there is a small decline in the subsidy for the average graduate in the second quintile, and a larger decline for the average graduate in the upper quintiles, though they still keep some of the subsidy.

If fiscal constraints make it necessary to derive at least some saving from lower earners, options 3 and 4 can be combined with higher monthly repayments, as shown in Tables 3 and 4.

7. There is no unambiguously best option. The optimal policy depends on the relative weights policy makers attach to (a) reducing public spending, (b) protecting graduates with low lifetime earnings, and (c) protecting the highest earners from repaying significantly more than they borrowed. Politicians face a policy trilemma; they can choose two of these objectives, but at the expense of the third.

8. The concluding section sets out the policy gains.

9. *Distributional gains*: replacing a blanket interest subsidy by a targeted subsidy removes an unintended and undesirable regressive element in student loans, eliminating a significant subsidy for rich graduate earners. According to our estimates, the current system provides a subsidy of £3,950, about 20 per cent of the loan, to the average graduate in the highest quintile of graduate earners.

10. *Increased capacity to expand the loan system*: the substantial cost saving can (and should) be used to expand the loan system:

- Larger loans for existing recipients:
    - To cover any increase in the fees cap;
    - To raise the maintenance loan.
- Expanding the system to cover new groups:
    - To part-time students, with gains in efficiency and participation;
    - To postgraduate students;
    - Over time, to students in tertiary education and training more broadly.

11. *Private finance on better terms*: The higher the fraction of total lending that is repaid, the better the terms on which a government could sell loans to private sources of finance.

Interest subsidies on student loans: A better class of drain[1]

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1 The backdrop

This paper discusses the problems that arise from interest subsidies in the UK system of student loans; systems in other countries, for example Australia and New Zealand, face similar problems. The topic appears to be narrow and technical, and of significance only to the most nerdy of commentators, so the opening section sets out the broader context in order to establish the educational importance of the issue, not least that the cost of interest subsidies is a contributory cause of the current shortage of university places. The second section explains why the interest subsidy is a major distortion with strategic and unintended ill-effects: interest subsidies tip large volumes of taxpayer resources down the drain with no educational benefit. The third section offers indicative estimates of the impact in terms of cost saving and distributional effects of different policies for addressing the problem. The concluding section sets out the wide range of desirable policy options that result from charging an interest rate related to the government's cost of borrowing.

1.1 The broader context

Technological advance is raising the demand for skills, so that countries need large, high-quality systems of higher education (and of tertiary education more broadly). But higher education competes for public funds with population ageing and upward pressures on medical spending in a context of increased international competition – quite apart from spending constraints related to current economic turbulence.

[1] We are grateful to the Institute for Fiscal Studies for the data on earnings profiles on which the estimates in section 3 are based, and to Lorraine Dearden, Alissa Goodman. Greg Kaplan and Gill Wyness for helpful discussions. We are also grateful to Howard Davies and Andrew Turnbull for helpful advice, to Lewis Crouch for invaluable tutorials on the operation of the public accounts, to Neil Shephard for comments on earlier versions, and to Lior Herman, and participants at the European Institute Lunchtime Seminar. None of them should be implicated in the views expressed or remaining errors, which are entirely our responsibility. This paper is a revised version of that circulated in February, using a more fine-grained estimation technique based on individuals rather than quintile averages.

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Thus countries typically pursue three efficiency goals in higher education: larger quantity, higher quality, and contained public spending. It is easy to achieve any two, but only at the expense of the third: a system can be large and tax-financed, but with worries about quality (France, Germany, Greece, Italy); or it can be high-quality and tax-financed, but small (the UK until about 1990); or it can be large and high-quality, but fiscally expensive (as in Scandinavia), an option not available to most countries. For most countries the only realistic way forward is to supplement public finance with private finance. Alongside this fiscal reason for cost sharing is the parallel microeconomic argument that higher education has social benefits (justifying continuing taxpayer subsidy) but also significant private benefits, justifying a contribution from the beneficiary.

Thus the case for an element of private finance is robust, but policy needs to be designed carefully to ensure that it does not harm efforts to widen participation, an objective that can be justified both as a central equity goal and on efficiency grounds, in that countries cannot afford to waste talent. In particular, if private finance relies on family resources, the resulting credit constraint will be inefficient and, by particularly affecting people from poorer families, also inequitable. Thus well-designed student loans are necessary for both efficiency and equity reasons. Such loans should be large enough that higher education is free at the point of use; to make that possible, the loan system needs to be fiscally parsimonious.

1.2 Current arrangements

THE SYSTEM IN ENGLAND.[3] The arrangements introduced in 2006 were designed to increase efficiency and simultaneously to improve equity. The system has three legs:[4]

- Element 1: deferred variable fees promote quality by bringing more resources to universities and, by strengthening competition, creating incentives to use those resources efficiently. As part of the process of adjustment, fees are capped at £3,000 in real terms.
- Element 2: student loans, described shortly in more detail, have income-contingent repayments and cover fees and living costs, thus making higher education free, or

[3] The system of student loans is UK-wide; the arrangements for fees and non-loan student support, however, are different in England, Wales and Scotland. We discuss only the English case.

[4] For fuller discussion, see Barr 2004, 2009, and on the turbulent history of reform in the UK, Barr and Crawford 2005). For an international overview, see OECD (2008*a*, *b*).

largely so, at the point of use. The interest rate on student loans is equal to the inflation rate, i.e. a zero real interest rate; thus the interest rate is subsidised.

- Element 3: measures to widen participation include policies to encourage young people to stay in school, maintenance grants from public sources and bursaries from universities.

The 2004 legislation which introduced this system was highly controversial. Part of the political settlement was that there would be a review of higher education – The Independent Review of Higher Education Funding and Student Finance. Each of the three elements just discussed faces stress points (for fuller discussion, see Barr 2010). One issue is whether the fees cap should be kept at £3,000, or increased. A second is how to make policies to widen participation more effective. Though of central importance, neither of these issues is discussed here. Instead, we focus on the interest subsidy on student loans, arguing that the motivation for the subsidy, widening participation, is impeccable, but that blanket interest subsidies make the achievement of that goal improbably expensive, creating major inefficiencies and, by failing to help the right people, also major inequities.

STUDENT LOANS IN THE UK FROM 2006. The system of income contingent loans has features designed to protect people with low annual earnings, and also with low lifetime earnings:

- Income-contingent loans cover living costs (the maintenance loan) and tuition charges (the fees loan). Repayments are 9 per cent of income above £15,000 per year; thus someone earning £18,000 repays 9% of £3,000, i.e. £270 per year or £22.50 per month. For most people, these repayments are collected as a payroll deduction alongside income tax and national insurance contributions.
- Both the maintenance loan and the fees loan charge an interest rate equal to the rate of inflation: a person's outstanding balance increases each year in line with the increase in the retail price index. Thus student loans charge a zero real interest rate. Since this is less than it costs the government to borrow the money, the system incorporates a blanket interest subsidy for all graduates.
- Any loan that remains unpaid after 25 years is forgiven.

The central argument of this paper is that instead of charging a zero real interest rate, the default interest rate should be related to the government's cost of borrowing, with targeted subsidies for low earners. Under the present system even the best-off graduates receive a subsidy. Even worse, the subsidy from the zero real interest rate *alone* (i.e. not including the 25 year write off) is highly regressive (see Figure 1). Subsidies targeted towards poorer graduates are both more cost-effective and more equitable.

2 What interest rate?

2.1 Blanket interest subsidies: What's the problem?

It is argued that interest subsidies make loans cheaper and thus help to widen participation. We strongly support the objective of widening participation, but interest subsidies fail dismally to achieve it (Barr, 2001, Ch. 12; 2004). There are four sets of problems.

COST. The subsidy is very expensive. Earlier estimates (Barr, 2001, pp. 204-5) suggest that between 30 and 35 per cent of all lending is not repaid because of the interest subsidy. The 2006 Report of the Department for Education and Skills estimates that the cost of the zero real rate and the 25-years write-off for fees and maintenance loans in 2007/08 was about £1 billion, out of total lending to students in England of £3.9 billion,[5] almost a tenth of public spending of £12.6 billion on English higher education in 2007 (Department for Education and Skills Annual Report, 2007). According to government figures, an average of 29 pence of each £1 of maintenance loan will not be repaid because of these subsidies; the comparable figures for fees loans (which are deemed to be paid after the maintenance loan has been repaid) is 42 pence. As discussed below, we estimate that the average graduate receives a 30 per cent subsidy.

For at least three reasons, the high cost of interest subsidies should not be surprising:

- The subsidies apply to all borrowers, for the whole loan, and for the entire duration of the loan. Thus *nobody* repays their loan in full. Even the richest quintile of graduate earners can expect to receive a subsidy of about 20 per cent (Table 1 and Section 3).

[5] The total of £3.9 billion comprises maintenance loans of £2.6 billion and fees loans £1.3 billion (provisional figures for 2007/08. The provisional figures for 2008/09 show total lending of £4.55 billion, comprising £2.5 billion for maintenance loans and £2 billion for fees loans (Student Loans Company 2008a, Table 4A and 4B).

- The duration of repayments is long; this is desirable, since it is efficient if the duration of a loan is related to the life of the asset, hence 3-year car loans but 25-year home loans. With an interest subsidy, however, the longer the life of the loan, the greater the cost of the subsidy.

- Borrowers face an incentive to arbitrage: students who do not need the money nevertheless borrow as much as they are allowed and put the money into a savings account, making a profit because the interest rate on the savings account is higher than the rate on the student loan. Since the incentive is so clear, it is not surprising that the problem is international:

  > 'To compound matters, the policy [of interest subsidy] has made it possible for learners to borrow money and invest it for private gain (arbitrage)…. [T]his policy should be discontinued – or … , as a minimum, the incentives for arbitrage should be removed' (New Zealand Tertiary Education Advisory Commission, 2001, p. 14).

These high costs lead to further ill effects.

IMPEDIMENTS TO QUALITY AND QUANTITY. Student support is politically more sensitive than public spending that goes directly to universities to finance teaching and research. Thus the cost of the interest subsidy crowds out resources for universities, putting quality at risk. Much more visibly, the excess demand for places starting in 2009 and 2010 has its roots in fiscal constraints; interest subsidies are not the whole problem but there is no question that they make things worse.

IMPEDIMENTS TO ACCESS. Because loans are expensive, they are rationed. It is no accident that in the arrangements in place between 1998 and 2006 there was no loan to cover fees and the maintenance loan was too small to cover living costs. The 2006 reforms addressed the former and made some progress on the latter. It remains the case, however, that students from better-off backgrounds are not eligible for a full loan, i.e. loans are income tested,[6] and the maintenance loan is not yet sufficient to cover realistic living costs.

[6] Students from the best-off backgrounds are entitled to 75 per cent of the full loan.

Nor is it an accident that the current loan arrangements exclude other groups including part-time students, postgraduate students (including, importantly, the increasing number of students doing Masters degrees), and students in further education. Nor has there been discussion of wide-ranging loans as an ingredient in lifelong learning, for example for someone doing a second first degree. These are all serious lacunae.

REGRESSIVE. The intuition of interest subsidies is clear but mistaken. With conventional loans, repayments are £*X* per month for a fixed number of years; a lower interest rate therefore leads to smaller monthly repayments, making loans more affordable for people with low incomes, for example, first-time house buyers. This type of subsidy has distributional effects that many find attractive, and hence political appeal.

Those arguments, however, are turned upside down where loans (a) have income-contingent repayments, protecting people with low current earnings, and (b) forgive any loan outstanding after *n* years, protecting people with low lifetime earnings. In such a system, the incidence of an interest subsidy is regressive as explained in Box 1.

Box 1: Who benefits from interest subsidies?

It is easiest to see the incidence of interest subsidies by considering different groups.

- Students do not benefit, since they make no loan repayments (graduates make repayments).
- Low-earning graduates receive no benefit from the interest subsidy (see Figure 1). In an income-contingent system, monthly repayments depend *only* on the person's monthly income. The interest rate has no effect on monthly repayments, but only on the duration of the loan – for a given income stream it takes longer to repay if the interest rate is higher. Thus people with low earnings make low, or no repayments; and if earnings remain low over the long term, unpaid debt is forgiven.
- High-earning graduates with low earnings early in their career receive some benefit. Their monthly repayments are low early in their career because their income is low. The interest rate affects only the duration of the loan.
- Graduates with earnings high enough to repay their loan in full receive the most benefit. For a given income, a lower interest rate reduces the duration of the loan.

Thus the repayments of a financially successful graduate are switched off after (say) 11 years, rather than after (say) 12 years with a higher interest rate.

Thus beneficiaries tend to be successful professionals in mid career, whose loan repayments stop earlier because of the subsidy. This is the group that needs help least.

These arguments make it clear that lower earners are protected not by the interest subsidy but by the combined effect of income-contingent repayments and forgiveness after 25 years. The role of the latter in protecting people with low lifetime earnings is particularly important, with a significant gender gradient, since it is disproportionately women whose careers are interrupted by caregiving (Figure 1). The argument is clear in principle and amply supported empirically, as discussed below. The question is whether government should spend over a billion pounds annually helping wealthy people become wealthier, or whether it should use those resources to promote access through better-targeted activities, and to improve quality through more resources for universities.

IN SUM. The interest subsidy is a major price distortion. Like many price distortions, it is inefficient and inequitable. The core analytical error is to use a price subsidy for distributional purposes. The greater part of public spending on the subsidy benefits people who repay in full, and who would do so even without the subsidy – a pure deadweight cost.

The resulting inefficiencies include distortions to decisions about:

- the balance between loans and family support;
- the balance between loans and paid work;
- the balance between student support and university income, putting quality and quantity at risk;
- the balance between loans and private sources of student support (e.g. loans are too small, putting access at risk);
- the availability of loans for certain groups (part-time students, postgraduate students, students in further education).

These problems, unfortunately, are not peculiar to the UK. Though policies about interest rates on student loans vary substantially across countries (for an overview, see OECD 2008*c*), many countries have large interest subsidies. This is not inevitable. In countries like

The Netherlands and Sweden, loans attract a positive real interest rate, a fact that is pretty much taken for granted.

2.2 Evidence: The distribution of subsidies

This section goes into more detail on the distributional effect of subsidies, drawing on our own estimates and on Dearden, Fitzsimons, Goodman, and Kaplan (2008).

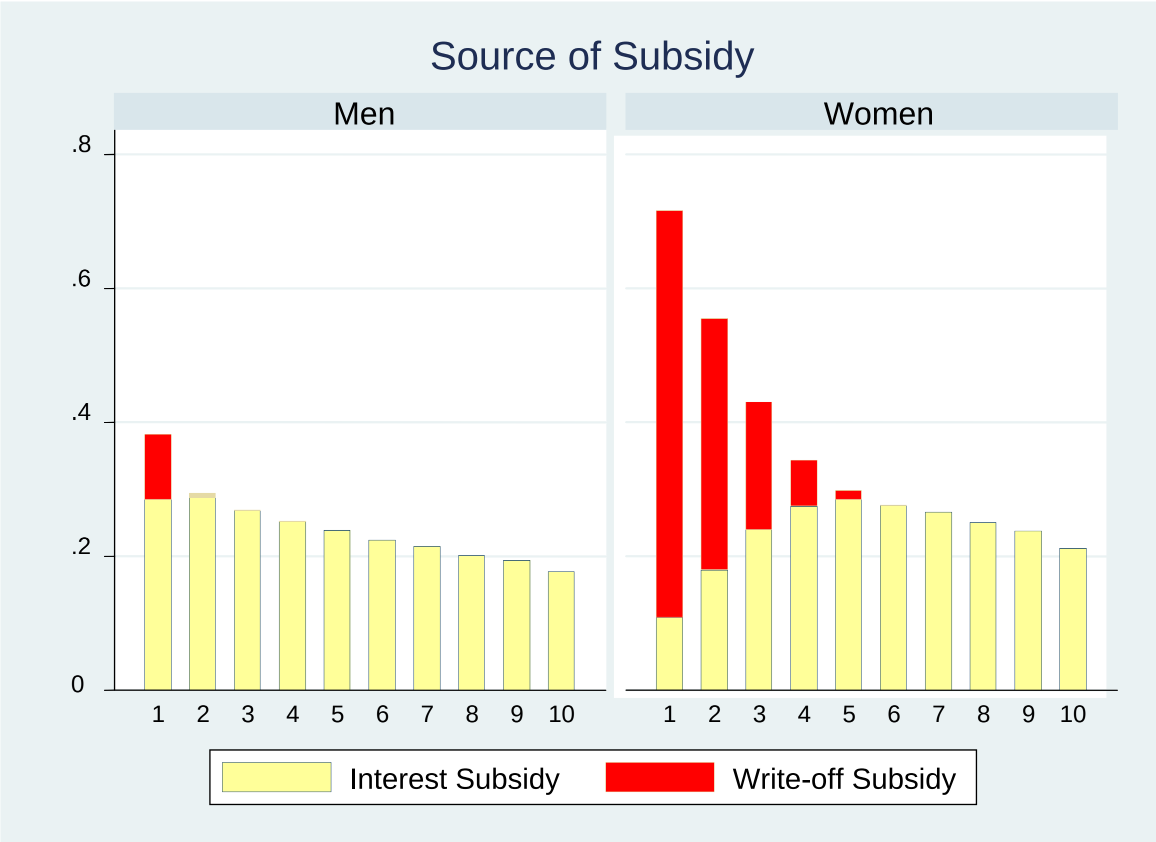
Figure 1 illustrates the important distinction between two sources of redistribution.

- Forgiveness after 25 years (the darker shading): this part of the system benefits people who have not repaid their loan after 25 years, i.e. people with low lifetime earnings. Such non-repayment represents well-targeted social policy spending and is a deliberate feature of the system.
- The interest subsidy (the lighter shading): this part of the system benefits people who repay their loan within 25 years. This subsidy, *given 25 year forgiveness,* has all the disadvantages outlined above and no offsetting advantages.

WHO BENEFITS? Figure 1 shows estimates of non-repayment of loans by decile of the lifetime earnings distribution, for graduates who took out the maximum loan for a 3-year course living outside London and away from home. Looking at the total figure, non-repayment is greatest for those with the lowest lifetime earnings (decile 1) and smallest for those with the largest lifetime incomes (decile 10), so that the loan system as a whole is progressive. That view, however, is deeply misleading because it conflates the two very different forms of subsidy. The picture is very different when we decompose the two.

Considering the zero real interest rate (the lighter shading) on its own, Figure 1 shows that graduates in higher and medium deciles of male earners benefit almost as much as those in lower deciles. There are gains also for earners in the upper deciles of the female earnings distribution. In contrast, forgiveness after 25 years (the darker shading) mainly benefits the lowest earners. Since women on average have lower lifetime earnings than men, forgiveness after 25 years mainly benefits female graduates, the interest subsidy mainly benefits male graduates.

Figure 1: Current system: subsidy as per cent of total loan, across decile of lifetime earnings distribution



Source: Authors' calculations using salary path data from the Institute for Fiscal Studies.

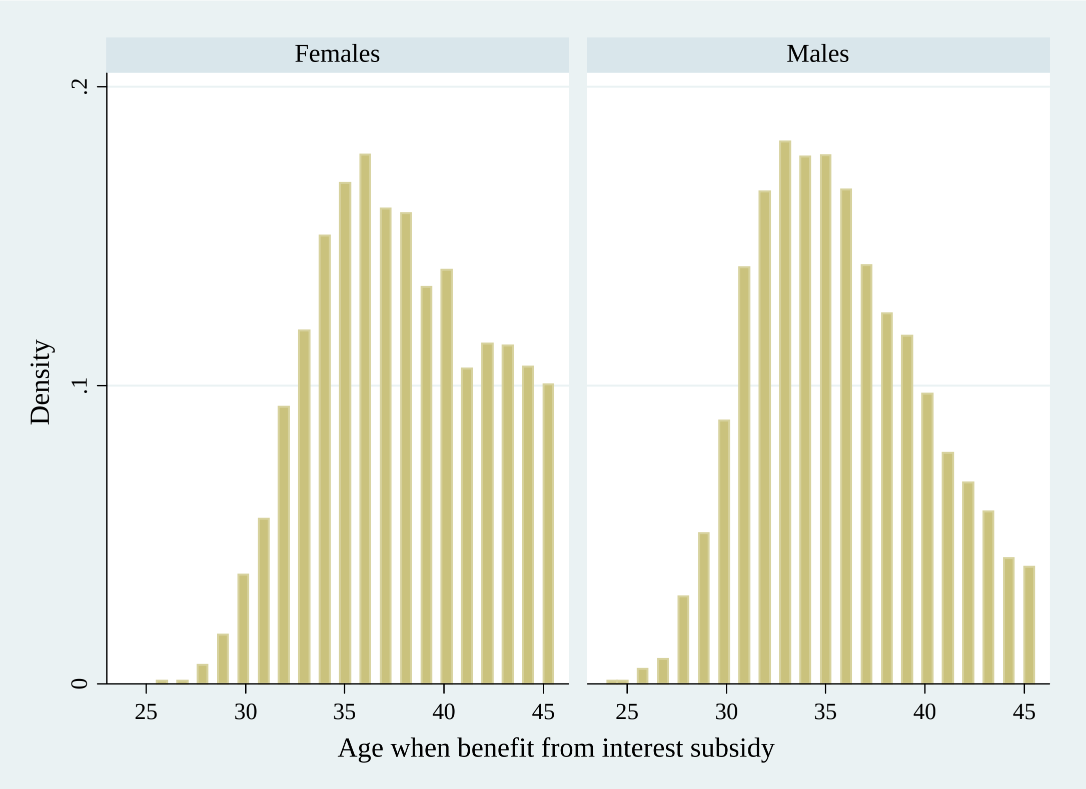
Later discussion explains this result in more detail. Assuming a loan balance of £20,235 at graduation,[7] the repayment path of the great majority of graduates in the bottom of the lowest quintile of earners with a 3 per cent real interest rate is identical to that with a zero real rate – ***at a 3 per cent real interest rate, low lifetime earners do not pay a penny more in repayments over their lifetime***. The reason is simple: loan repayments never cover the annual interest charge. The combined effect of income-contingent repayments and 25-year forgiveness means that the repayments of low lifetime earners are the same under a real interest rate as at present.

Figure 1 shows the value of the interest subsidy and forgiveness, but not what would happen if the subsidy were removed. The reason is that we cannot predict what total graduate repayments would be under a system with a positive real interest rate, since graduates could

[7] See section 3 for the derivation of this figure.

influence the level and timing of their repayments – for example, higher earners, facing a positive real interest rate, might accelerate repayment.[8] We can, however, predict the influence of a real interest rate on mandatory repayments, discussed in section 3.

Figure 2: Age at which payments cease, for those who benefit from interest subsidies



Source: Institute for Fiscal Studies, personal communication.

WHEN DO PEOPLE BENEFIT? As noted, with income-contingent arrangements a lower interest rate means that repayments stop sooner. Figure 2 shows the age at which repayment stops. For both men and women, people tend to benefit from the interest subsidy in their 30s and early 40s. This result confirms the earlier argument that the major beneficiaries are successful professionals in mid career.

2.3 What is the right rate of interest?

THE WRONG RATE.

- For the reasons set out earlier, a zero real interest rate is the wrong one.

[8] Borrowers can at any time make accelerated repayments directly to the Student Loans Company.

- At the other end of the spectrum, a second wrong rate is what is sometimes called the 'commercial rate', that is, the unsecured individual rate such as that on credit cards or bank overdrafts. As Milton Friedman (1955) pointed out, this interest rate is inefficiently high, the root cause being the absence of physical collateral for investment in human capital. For that reason, borrowing, and hence investment in human capital, will be inefficiently low. An important motivation for income-contingent repayments is to address that inefficiency.
- A third type of error is to have a grace period at the start of the loan, whereby no real interest rate is charged until a student starts work. In a system with income-contingent repayments and forgiveness after *n* years, such a subsidy serves no useful purpose, and is extremely expensive (see Shen and Ziderman 2008).

THE RIGHT RATE. The right starting point is to charge an interest rate related to the government's cost of borrowing for all borrowers, for the entire loan, for the entire duration of the loan, from day one onwards. That approach can be modified in several ways.

- It *should* be modified by targeted interest subsidies, such that a person's real debt does not rise during periods of low earnings. Such a policy, illustrated in Box 3, can be implemented in a number of ways, and in ways that are compatible with the Student Loans Company's administrative processes.
- It *can* be modified to share the cost of non-repayment in different ways. An income-contingent system with no interest subsidy creates an inevitable loss because of people with low-lifetime earnings. That loss can be met by the taxpayer; or can be borne by the cohort of borrowers through a cohort risk premium; or can be shared between the two groups if the cohort risk premium covers some but not all of the loss.

In 1989 and 1992, respectively, Australia and New Zealand introduced tuition fees covered by an income contingent loan. The systems in the two countries, discussed in Boxes 2 and 3, offer useful lessons.

Box 2: Student loans in Australia: What is wrong with an upfront discount

In the system in Australia, Commonwealth funded students[9] can choose between (a) taking out an income-contingent loan with a zero real interest rate to pay for tuition fees, or (b) paying fees upfront at a discount. To keep the arithmetic simple, assume a standard fee of A$6,000, which can be paid either upfront at a 25 per cent discount, or deferred.

With upfront payment, the student turns up at university and hands over a cheque for $4,500 (i.e. $6,000 minus the 25 per cent discount). The university keeps the money.

If the student defers payment:

- The government sends the university $4,500. Thus the university is indifferent between upfront and deferred payment..
- The student agrees to make income-contingent repayments after graduation until he or she has repaid $6,000 in real terms.

Under this system, a borrower repays $6,000 in real terms, i.e. $1,500 more than the fee of $4,500 which the government has paid on his/her behalf. Thus (a) there is a positive real interest rate, but (b) the interest payment is in the form of a lump sum – $1,500. The lump-sum nature of the interest charge creates problems.

Efficiency:

- The interest rate is the price between present and future consumption. The $1,500 surcharge on the loan may cover the interest charge *on average*, but has none of the *marginal* incentive effects associated with a positive real rate. The resulting distortion varies both across individuals (the lump sum represents a higher implicit interest rate for high earners, who repay more quickly) and over time, in that the interest charge is unrelated to the cost of finance.
- A lump-sum charge adversely affects the incentive for a graduate to repay his or her loan early through voluntary repayments, in contrast with a real interest rate. For exactly that reason, Australia has introduced separate voluntary repayment bonuses, where some debt is forgiven if voluntary repayments exceed $500 per year.
- A lump-sum charge may create adverse selection – people who expect to be high earners pay upfront, leaving the government scheme with the bad risks.

[9] Australian nationals who do not get a government-supported place have to pay the full economic fee but are also eligible for an income-contingent loan. Though the system works in a slightly different way for this group, the analysis in this box applies equally to them.

- Social insurance: on one interpretation, people who sign up for the loan pay a lump-sum risk premium of $1,500 to cover the cost of their own loan plus the loss on the portfolio because people with low lifetime earnings do not repay in full. This social-insurance approach has much to commend it, but doing so in the form of a lump-sum is inefficient for all the reasons just discussed.

Equity: the real interest rate is lower for someone who takes longer to repay and higher for someone who repays more quickly. This is progressive relative to short-run earnings; however, someone may have low earnings early on (e.g. child rearing) and then go on to have very high earnings. Thus the scheme benefits people with lower short-run earnings, irrespective of their long-run earnings, and is thus a blunt instrument in distributional terms.

Scaleability: with a small loan the absolute distortion is relatively small. But if loans are large – for example to cover high fees and perhaps also living costs – the discount is absolutely larger, exacerbating all the problems outlined above.

In sum, the system in Australia has a positive real interest rate, but in the form of a lump-sum payment, an arrangement that causes distortions and adverse incentives to voluntary repayment that are different from those of a zero real interest rate. Charging a positive real rate such as the government's cost of borrowing, with no discount for upfront payment, avoids these ill-effects.

Box 3: Targeted interest subsidies in New Zealand, 1992-2000

The system of income-contingent loans in New Zealand's between 1992 and 2000 was simultaneously highly cost-efficient and protected low annual and low life-time earners.

The default interest rate. The starting point was the government's cost of borrowing. It was estimated that a risk premium of 2 per cent would cover the loss on the portfolio due mainly to low lifetime earnings. In the system in New Zealand, the interest charge was 1 per cent above the government's cost of borrowing, sharing the costs of non-repayment roughly equally between the taxpayer and the cohort of borrowers. Any system where some of the risk is borne by the cohort of borrowers introduces a social insurance element into the loan scheme.

Targeted interest subsidies. The default interest rate was 1 per cent above the government's cost of borrowing. But if the graduate's salary was so low that repayments did not cover that year's real interest payments, outstanding debt was adjusted so that his or her real debt did not increase. Put another way, the graduate received whatever interest subsidy was necessary in a given year to prevent his or her real debt rising.

Political aspects. This system – as close to the ideal as any country has ever managed – did not survive. The government failed to explain how the system worked and did not continue to campaign for it; as a result, populist political pressures and an unexpected electoral victory by the opposition in 1999 led to the introduction of interest subsidies.

3 Policies to improve the loan system

The analysis in the previous section suggests that it would be more efficient and more equitable if a greater fraction of total lending was repaid. There are two, and only two, ways of bringing this about: either graduates make larger monthly repayments (section 3.2), or they repay for longer (section 3.3). Section 3.4 discusses hybrids which combine the two approaches. The discussion investigates these approaches in terms of three sets of variables: the formula (repayment rate and threshold) that determines monthly repayments, the interest rate on the loan, and the duration of repayments, in each case looking at the saving in public-expenditure for the average graduate in each quintile of graduate earners. We also discuss the distributional effects of the different options. Section 3.5 (and, in more detail, Annex 1) discuss what resources these reforms make available, for what purposes, and when.

3.1 Data and method

The impact of the repayment formula and real interest rates has been widely studied. Barr and Falkingham (1996) examined the impact of increasing repayment rates (via National Insurance contributions), and found that increasing the repayment rate had a significant impact on the fraction of borrowing that was repaid. Goodman and Kaplan (2003) and Dearden et al. (2008) simulate the effect of the reforms that took effect in 2006 on the level of the interest subsidy and its distribution across graduate earners. This paper builds on their analyses. We have taken the opportunity to revise the version of the paper circulated in February. This version bases estimates on data on individuals rather than on quintile averages, which makes it possible to give a more refined decomposition of the costs and distributional effects of interest subsidy and debt write-off, respectively.

BASELINE ASSUMPTIONS. Our calculations assume that the government borrows at a real rate of interest of 3 per cent for the entire duration of the loan, as an estimate of the real rate on

UK government bonds over the past 25 years or so.[10] As a sensitivity test, Box 5 discusses how the results would differ with a 2 per cent real rate. Note, however, that we are *not* advocating an interest rate of 3 per cent, but an interest rate related to government's cost of borrowing; we illustrate such a system with our best estimate of the long-run real rate, 3 per cent.

Our estimates are based on an outstanding loan at graduation of £20,235. This figure is based upon the average take up per student for fees loans and maintenance loans, according to the Student Loans Company (2008, Tables 4A and 4B), for the years 2006/07, 2007/08 and 2008/09. The average fee loan in those three years was £2,710, £2,830, and £2,950 respectively, and the average maintenance loan £3,590, £3,530, and £3,560.[11] The remainder is based on inflation which accrues from the day the loan is taken out. For 2006/07, 2007/08 and 2008/09, the increase in the retail price index was 2.4, 4.8 and 1.5 per cent, respectively (www.slc.co.uk).

DATA. Our data on graduate real salary paths, generously provided by the Institute for Fiscal Studies, are those used by Dearden et al. (2008). The data comprise simulated annual earnings for 20,000 individuals (10,000 men and 10,000 women) each year from age 22 to 60, together with their cumulative lifetime earnings over those years. The data are for real earnings, hence exclude inflation. Each graduate was given two percentile rankings according to his/her lifetime earnings: one according to the entire sample of graduates and one according to the graduate's gender. We ranked graduates according to the entire sample rather than by gender. Thus the quintiles we examine contain both men and women, though the highest quintile of graduate earners contained approximately 85 per cent men, and our lowest quintile approximately 85 per cent women. The middle quintile had approximately 46 per cent men. Due to the copula method used by Dearden et al. (2008), earnings paths could allow for stochastic components to employment: if a graduate was not employed for a particularly year (for example, because of unemployment, acquiring additional qualifications,

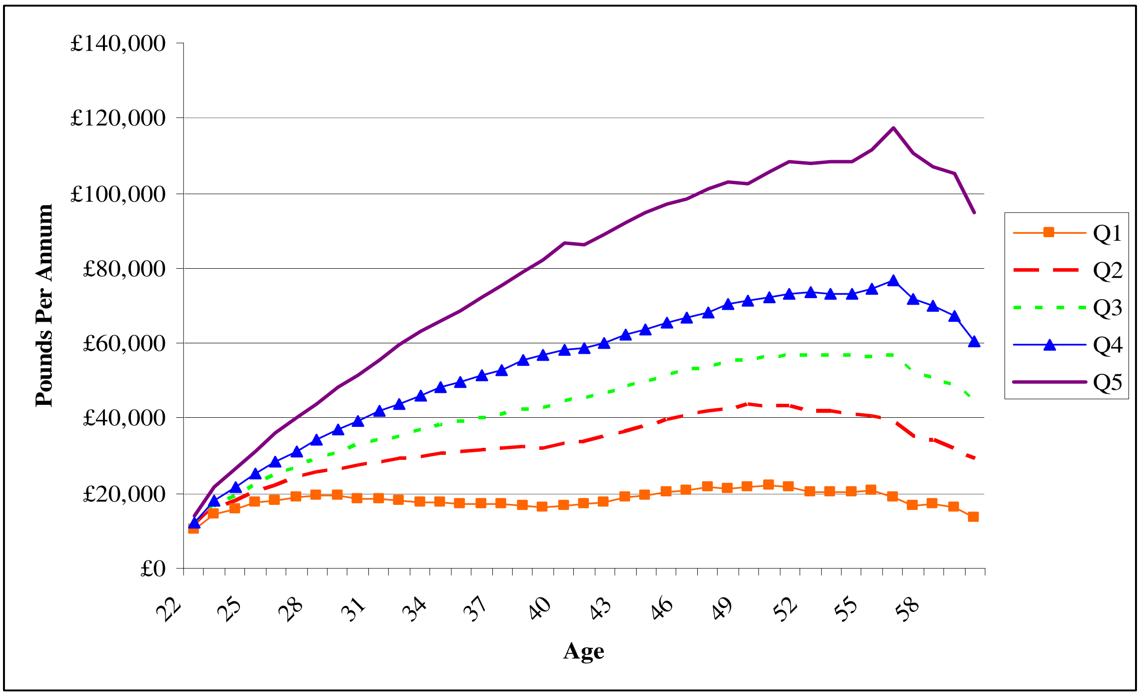
[10] Shephard (2009), drawing on Castle and Hendry (2009) notes a real interest rate of 2.86 per cent over the period 1976-2008. For a broadly similar picture, see Brooke, Clare and Lekkos (2000, Chart 7). Dearden et al. (2010) estimate the costs of the interest subsidy using an interest rate of 2.2 per cent – the main (though not the only) reason why their estimates of the costs of the policy are lower than ours. Using data from the IMF International Financial Statistics database, the period average from 1980 to 2008 of the real yield on long term UK government bonds, calculated as the nominal (percentage) yield minus CPI, was 3.44 per cent.

[11] These estimates are based on students who entered higher education after the 2006/07 academic year, and subject to the £3,000 fee.

or dropping out of the labour force to raise children), their earnings are zero. Once they become employed, the authors base their earnings on the length of employment and previous wage. This provides more realistic earnings paths for graduates, in contrast with those that assume that the graduate works each year after leaving university.

We examined an average salary path for each quintile of graduate earnings, as shown in Figure 3. The average starting salaries for all quintiles are relatively similar and fairly low, largely because the majority of graduates in all quintiles have zero earnings at age 22, either because they are continuing to study or because they do not yet enter employment. The bottom quintile experiences a slight fall in earnings in early/mid career, with earnings falling at age 30 and not rising until about age 40. This is plausible, since most individuals in this quintile are women, who are more likely to drop out of the labour force to raise children.

Figure 3: Average graduate (real wage) salary path for the lowest, middle and top quintiles



Source: Authors' calculations using salary path data from the Institute for Fiscal Studies.

CAVEATS. The paper offers information on the relative power of different policies to reduce the cost of the interest subsidy. For several reasons, however, estimates of the likely range of savings are only indicative.

- The earnings paths are not predictions of the future, but simulations based on a series of assumptions. Given the economic crisis, graduate salary paths for all quintiles, particularly the upper one, might rise more slowly in the future.

- Our estimates do not include inflation since the earnings data are in real terms; student borrowing is also in real terms.

- The size of the subsidy depends on a range of assumptions, including a person's loan balance at graduation and the government's cost of borrowing. However, though the *level* of the subsidy varies according to these parameters, the *rank* of cost-saving for each policy is unaffected by different levels of borrowing or different interest rates.

- The Student Loans Company has data on each student's maintenance loan and each student's fees loan but does not consolidate the two sets of borrowing. Thus there is no information on each student's total loan balance at graduation. We know the average total (fees + maintenance) loan, but not its variation across students. We use the separate averages for fee and maintenance loans to estimate total borrowing by the average graduate at the time he/she leaves university.

- We assume that the total outstanding loan at graduation is equal for all quintiles of graduate earners. This assumption is problematic. Students from poorer households receive more grants and bursaries, and hence may graduate with a smaller loan than students from middle-income households. Likewise, students from the richest households may require less student support in the form of loans, relying more on family income. However, we are not able to match pre-university family income with post-graduation salary paths. Rather than merely assuming that graduates in the lower quintile of earners came from low-income households and vice versa, we assign the same loan balance at graduation to all quintiles.

BASELINE ESTIMATE: THE CURRENT SYSTEM. Assuming a loan at graduation of £20,235 and a real interest rate of 3 per cent, Table 1 shows our estimates of non-repayment:[12]

- Graduates in the lowest quintile receive an overall subsidy of 53.4 per cent of their total loan, i.e. non-repayment is £10,800. Of this subsidy, 19.4 per cent is due to the interest subsidy, the remaining 34 per cent to debt write-off.

[12] These figures are calculated by dividing the repayments made by the graduate by the real value of the loan.

- Graduates in the top four quintiles receive a subsidy of 30.6%, 26.2%, 23.3% and 19.5% of the loan, respectively, representing non-repayment for the average graduate in those quintiles of £6,190, £5,310, £4,715 and £3,950, respectively. The average write-off in the top three quintiles is close to, but not equal to, zero. Thus in these quintiles, *non-repayment is almost entirely the result of the interest subsidy*, i.e. the lighter shaded area in Figure 1. For graduates in the second lowest quintile, the interest subsidy is 28.4 per cent of the loan and the write-off 2.2 per cent.

The rest of this section discusses how to reduce or eliminate the high cost of the second element of subsidy while continuing to protect low earners. Sections 3.2 and 3.3 discuss two strategic approaches: higher monthly repayments or a longer duration of repayments. We estimate the effects of a series of moderate reforms (Options 1a, 2a and 3a). We then stress test these reforms by estimating more radical versions of each (Options 1b, 2b, and 3b), partly to investigate their effects more closely and partly to illustrate that though doing nothing (i.e. the current system) is suboptimal, so is reform that is too radical – the stringency of reform should be optimised not maximised. Section 3.4 discusses hybrids that combine some of the pure options. We also introduce an innovative reform option: a repayment extension for graduates who repay their loans before the debt-write off. Such an extension provides numerous benefits: it leaves graduates in the poorest quintile unaffected; it is more progressive across the upper four earnings quintiles than a real rate of interest; it provides greater cost savings than a real rate of interest; it is administratively simple; and it avoids the current lag in paying refunds on overpayments at the end of the loan.

3.2 Strategy 1: Higher monthly repayments

OPTION 1: HIGHER MONTHLY REPAYMENTS. This option increases the current repayment rate of 9 per cent and lowers the repayment threshold of £15,000 per year. We consider two options. Increasing the repayment rate to 12 per cent of income above £12,500 does little to reduce the interest subsidy for the top three quintiles: as Table 2 shows: compared with the current system the average saving for these quintiles is £1,025, £870 and £690, respectively. Most savings come from the lowest quintile (approximately £3,000 for the average graduate). Because there is so little saving from the higher quintiles the average saving per graduate across all quintiles, £1,330, is among the smallest of all the options we examine. If policy makers want larger cost savings through alterations in repayment conditions only, they will have to implement more drastic changes in the threshold or repayment rate.

To illustrate a more stringent arrangement option 1b considers repayments of 12 per cent of income above £10,000. Such a regime reduces the cost of the subsidy from 53.4 per cent to 32.6 per cent for the lowest quintile, from 26.2 per cent to 19.4 per cent for the middle quintile, and from 19.5 per cent to 15.0 per cent for the top quintile (Table 1). The resulting average saving is £1,820 per graduate (Table 2). However, most of that saving, £4,210, comes from the average graduate in the lowest quintile, with only £910 from an average graduate in the highest quintile. Thus raising monthly repayments on its own is either relatively ineffective at cost-savings if alterations are moderate (option 1a), or regressive and hence unattractive: in our more stringent case, the lowest quintile keeps 61 per cent of its original subsidy (i.e. 32.6 per cent in Option 1b, compared with 53.4 per cent under the current system), while the top four quintiles retain 70%, 74%, 75% and 77%, respectively.

3.3 Strategy 2: Longer duration of repayments

First, two central points of recapitulation. All the options in this section increase repayments by charging a positive real interest rate. With income-contingent loans, the effect is to extend the duration of the loan. As a result:

- No graduate pays an extra penny in terms of monthly repayments; what changes is that repayments continue for longer.
- But extending duration has no effect for graduates who hit the 25-year limit. Such graduates have low lifetime earnings and are therefore unaffected by a positive real interest rate; thus their loan subsidy remains nearly 50 per cent of the loan.

OPTION 2: A REAL INTEREST RATE WITH FULL PROTECTION AGAINST RISING REAL DEBT. In this case, a New Zealand type arrangement (Box 3) ensuring that real debt does not rise, has greater effects for the upper quintiles.

Table 1: Average loan subsidy under pure options for a graduate with £20,235 debt, by quintile

	Lowest quintile **Non-repayment predominantly because of write-off**	**Second Quintile** **Non-repayment because of write-off and interest subsidy**	**Middle quintile** **Non-repayment because of interest subsidy**	**Fourth Quintile** **Non-repayment because of interest subsidy**	**Top quintile** **Non-repayment because of interest subsidy**
Current System	53.4% (£10,800)	30.6% (£6,190)	26.2% (£5,310)	23.3% (£4,715)	19.5% (£3,950)
Option 1a (change in repayment conditions only – 12% above £12,500)	38.6% (£7,805)	23.8% (£4,810)	21.2% (£4,285)	19.0% (£3,845)	16.1% (£3,260)
Option 1b (change in repayment conditions only – 12% above £10,000)	32.6% (£6,590)	21.5% (£4,350)	19.4% (£3,915)	17.5% (£3,545)	15.0% (£3,040)
Option 2a (3% interest rate with a NZ variant)	49.8% (£10,075)	19.6% (£3,960)	13.0% (£2,635)	11.6% (£2,350)	11.3% (£2,285)
Option 2b (4% interest rate with a NZ variant)	49.6% (£9,825)	14.9% (£3,020)	6.3% (£1,270)	5.2% (£1,045)	5.6% (£1,130)
Option 3a (2 year repayment extension)[13]	49.8% (£10,075)	18.5% (£3,740)	8.2% (£1,650)	0.1% (£150)	-10.1% (Graduate overpays £2,050)
Option 3b (3 year repayment extension	48.7% (£9,845)	13.8% (£2,800)	0.4% (£80)	-9.0% (Graduate overpays £1,815)	-19.5% (Graduate overpays £3,955)
Option 4 (3% interest with a NZ variant after year 5)	48.8% (£9,875)	15.9% (£3,220)	7.6% (£1,530)	6.8% (£1,375)	8.0% (£1,645)

Source: Authors' calculations using salary data on salary paths from the Institute for Fiscal Studies.

[13] For both repayment extension options, we place a cap on over-repayments of 25% on all graduates; that is no graduate will repay more than 125% of their total debt.

Table 2: Average savings per student by quintile for pure options (compared to current system)

	Lowest quintile	**Second quintile**	**Middle quintile**	**Fourth quintile**	**Top quintile**	***Average Savings per Graduate across cohort***
Option 1a	£2,995	£1,380	£1,025	£870	£690	***£1,330***
Option 1b	£4,210	£1,840	£1,395	£1,170	£910	***£1,820***
Option 2a	£725	£2,230	£2,675	£2,365	£1,665	***£1,945***
Option 2b	£975	£3,170	£4,040	£3,670	£2,820	***£2,970***
Option 3a	£725	£2,450	£3,660	£4,565	£6,000	***£3,610***
Option 3b	£955	£3,390	£5,230	£6,530	£7,905	***£4,970***
Option 4	£925	£2,790	£3,780	£3,340	£2,305	***£2,695***

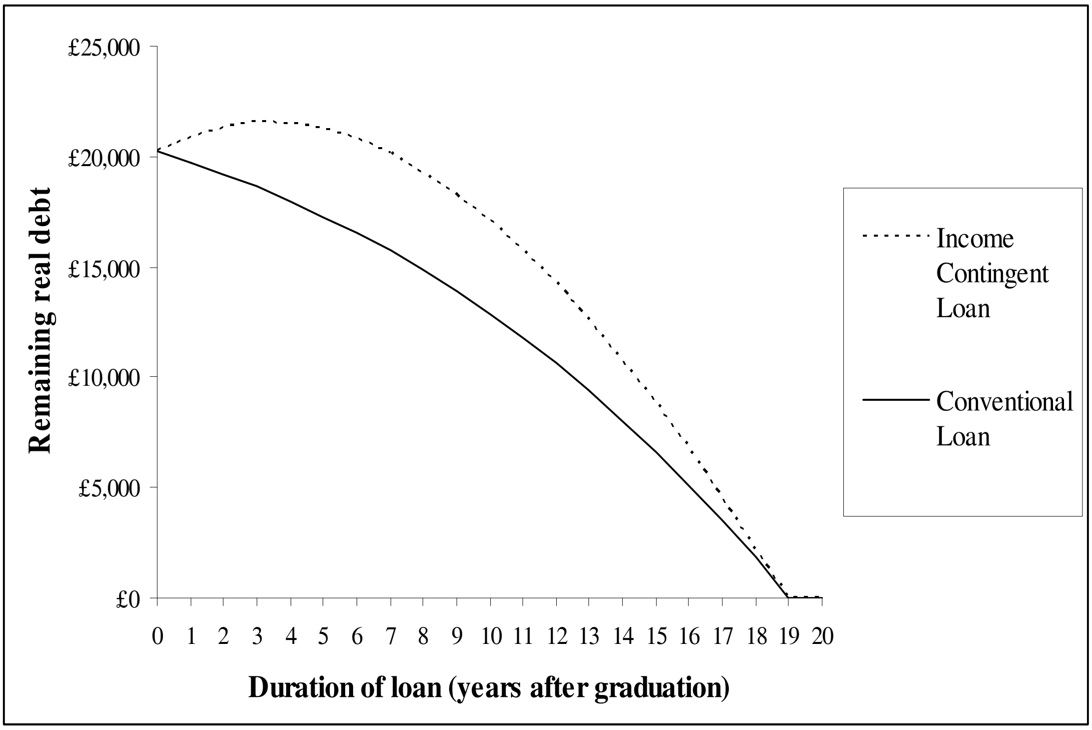
Source: Authors' calculations using data on salary paths from the Institute for Fiscal Studies.

A 3 per cent real interest rate reduces the subsidy for an average graduate in the second quintile from 30.6 per cent to 19.6 per cent (Table 1), in the middle quintile from 26.2 per cent to 13.0 per cent, in the fourth quintile from 23.3 per cent to 11.6 per cent, and in the top quintile from 19.5 per cent to 11.3 per cent. However, some subsidy remains even for the top group of earners because on average their earnings are too low in their first years of earnings to cover the interest charge. Box 4 explains why this outcome is typical of income-contingent repayments. As a result, the cost savings are small because the lowest quintile remains unaffected, yet some subsidy remains for the upper four quintiles. Average saving per graduate across the entire cohort is £1,945 (Table 2). In contrast, charging an interest rate 1 per cent above the government's borrowing rate (option 2b) reduces this subsidy further, leading to an average saving per graduate of £2,970 (Tables 1 and 2).

Box 4: A typical repayment trajectory: The importance of end-loading

The intuition of income-contingent repayments is very different from conventional loans. Consider someone graduating with a loan balance of £20,235 and a starting salary of £20,000. The first year's loan repayment is £450 (9% of earnings above £15,000), less than the interest charge of £607.05 (3% of £20,235). Thus repayments do not cover the person's interest liability, so the outstanding balance increases.

This result is entirely characteristic of income-contingent repayments. With conventional loans, annual repayments are fixed, so as earnings rise repayments fall as a fraction of earnings – repayments are front-loaded. With income-contingent repayments, it is not the annual repayment that is fixed but the fraction of income which is repaid. Thus as real earnings rise, so do repayments – income-contingent repayments are end-loaded. Thus a typical pattern is for a person's outstanding balance to rise in the early years, then to start to fall, and to fall rapidly in the later years of the loan.



Illustrative trajectory of repayments for an income-contingent loan and conventional loan.

Calculations assume an initial loan balance of £20,235 and a 3 per cent real interest rate. Income-contingent repayments relate to the real earnings path of an average graduate in the middle quintile. Repayments for the conventional loan are chosen to match the repayment duration of the income-contingent loan.

The figure illustrates a typical time-path of the two methods, using an average graduate from the middle quintile of graduate earners (see the earnings path in Figure 3). In the early years, income-contingent repayments (the dotted line) fail to cover interest charges and the person's outstanding loan balance rises. As real earnings rise, however, so do real repayments; the steep slope of the dotted line shows the speed with which the loan is extinguished in the later years. For comparison, the unbroken line shows the time path of mortgage repayments calculated to repay the same loan over the same period. Being front-loaded, repayments are larger in the early years and smaller in the later years.

Though charging a real rate of interest leaves the poorest quintile untouched, it is not entirely progressive across the rest of the distribution, since it reduces the subsidy most for the second quintile. Indeed, option 2b is slightly regressive, because the top quintile has a slightly larger loan subsidy than the second highest. Instead of providing a progressive reduction in loan subsidy across the upper four quintiles, it roughly equalises the subsidy in percentage terms across them (Table 1). Though the interest subsidy varies progressively with income, the degree of progressivity is quite distorted for the upper quintiles: the difference in loan subsidy between the middle quintile and the top quintile under option 2a is only 1.7 percentage points.

OPTION 3: EXTENDING REPAYMENT DURATION BY *N* YEARS. In this innovative arrangement, graduates who repay their total loan continue to repay for an additional *n* years.[14] At its simplest, repayments stop two years after the graduate has repaid his or her loan. Extending duration this way has the effect of imposing a real interest rate, but with a slightly different narrative: with a higher interest rate in option 2, the duration of the loan is the endogenous variable; with an extra 2 years of repayment, the interest rate is the endogenous variable. We model a repayment extension of 2 and 3 years, in each case with a maximum overpayment of 25 per cent, that is, no graduate overpays by more than 25% of his or her original loan.

The effect is powerful. Extending repayments by two years (option 3a) reduces the interest subsidy for the average graduate in the second quintile from 30.6 per cent to 18.5 per cent, in the middle quintile from 26.2 per cent to 8.2 per cent, in the fourth quintile from 23.3 per cent to 0.1 per cent, and in the top quintile from 19.5 per cent to –10.1 per cent (i.e. an overpayment), providing average saving per graduate of £3,610 across the entire cohort. Most graduates in the lowest quintile are unaffected, since they qualify for a 25-year write-off. Raising the repayment duration to 3 years (option 3b) reduces the subsidy for the average graduate in the middle quintile to 0.4 per cent, while an average graduate in the fourth and top quintile overpays by roughly 9 per cent and 19.5 per cent respectively. End-loading repayments in this way reduces the interest subsidy much more powerfully than increasing repayments at the start of a graduate's career. Graduates earn more later in their career, and hence can repay more than when they begin work. In addition, overpayment by

[14] If the extension pushes graduates past 25 years of repayment, they qualify for the write off; thus no graduate repays for longer than 25 years.

richer graduate earners means that a 3 year repayment extension provides the highest cost savings per graduate, £4,970, across the entire cohort.

Extending the duration of repayments is thus highly progressive, with considerable redistribution from the top to the bottom quintile in a given graduate cohort. It is also more progressive than a real interest rate. With a 3 year repayment extension, the second quintile keeps 45 per cent of its original subsidy, while the top quintile overpays. Overpayment by the top quintile is thus simultaneously progressive and cost-reducing. The extent of progressivity can be adjusted by reducing the cap on overpayments (we model a case where no graduate repays more than 125% of his or her initial loan) albeit reducing the resulting cost-saving.[15]

Alongside cost saving and redistributive effects, extending repayments has an administrative advantage. Currently, the Student Loans Company can 'switch off' repayments only with a lag, leading to frequent over-payments by graduates and subsequent refunds.[16] Extending the duration of repayments transforms this backward-looking accounting procedure into a forward-looking one. Once a graduate completes his or her repayments, the Student Loans Company adds the requisite number of additional years, and can then switch off repayments accurately.

OPTION 4: A REAL INTEREST RATE WITH PROTECTION AGAINST RISING REAL DEBT AFTER 5 YEARS. The previous options which provide the largest reduction in subsidy do so either by extracting significant extra repayments from the lowest quintile or by imposing significant overpayments on the top quintile. Option 4 simultaneously reduces the interest subsidy for the top four quintiles of graduates without any overpayment, and preserves the loan subsidy for the lowest quintile. It does so by allowing a graduate's real outstanding loan balance to rise for the first five years after graduation, i.e. a New Zealand type variant from year 6 onwards. The logic is simple. As discussed in Box 4, even with a positive real interest rate, the average graduate in the top quintile benefits from the interest subsidy because, on

[15] The National Union of Students has advocated a progressive graduate tax. Option 3 shows how it is possible to build a progressive element into the loan system.

[16] Income tax, national insurance contributions and student loan repayments are withheld by employers on a monthly basis but paid to the tax authorities en bloc, being broken down into individual contributions only after the end of the tax year. Thus a person who finishes his loan repayment during the tax year will usually have to wait until the end-year reconciliation before his loan account can be finalised.

average, repayments based his or her initial earnings do not fully cover the interest charge. The primary purpose of the New Zealand variant is to protect people with low lifetime earnings. Removing such protection, but only for the first five years does not harm this group (who are protected by 25-year forgiveness), but has the effect that the upper three quintiles repay in full, and the second quintile almost does so.

Specifically, graduates pay 9 per cent of income above £15,000, and are subject to a 3 per cent real interest rate, but if their salary is too low to repay interest in the first five years, real debt is allowed to rise. In the worst case, a graduate has no earnings, so his or her real loan balance rises by 3 per cent per year for five years, that is, by a maximum of 15.9 per cent, from £20,235 to £23,458. From year six, New Zealand type protection returns, so that a graduate's real outstanding balance does not rise any further. Low annual earners continue to be protected by income-contingent repayments and low lifetime earners continue to be protected by forgiveness after 25 years. However, graduates in the upper three quintiles of earners now repay more because the annual interest that was previously forgiven in the first 5 years remains part of the loan and hence is repaid. Compared to Option 2a (where real debt is not allowed to rise), enabling it to rise for the first 5 years produces further cost savings of £750 per graduate. Like option 2b, however, it is also slightly regressive, with the highest quintile witnessing a larger loan subsidy than the quintile below.

3.4 Hybrid options

There are two limitations to our New Zealand variant interest rate options. As mentioned, one is that it is not progressive above the second quintile – the average graduate in the middle quintile receives roughly the same subsidy as a graduate in the top quintile. Second, there is a limit to the amount the option can save because the bottom quintile keeps most of its subsidy (roughly 50 per cent of the total loan, about £10,120 per graduate for a loan balance of £20,235 at graduation). Though protecting graduates with low lifetime earnings is an important objective, the current budgetary climate may require some reduction in subsidy for this group as well. The only way to do so is to alter repayment conditions so as to increase monthly repayments. As the discussion of option 1 showed, this move on its own is regressive, but if combined with a real interest rate or repayment extension, the increase in monthly repayments can be correspondingly smaller, while still providing significant savings.

We therefore consider three hybrid options which combine an increase in monthly repayments with longer duration of repayments.

OPTION 5: HIGHER MONTHLY REPAYMENTS PLUS A 3 PER REAL INTEREST RATE WITH FULL PROTECTION AGAINST RISING REAL DEBT. Specifically, this is option 1a combined with option 2a. Compared with option 2a, this hybrid saves an additional £860 per average graduate (i.e. an average saving per graduate of £2,805 in option 5, compared with £1,945 in option 2a); it also continues to provide the lowest quintile of graduate earners with a 32.8 per cent subsidy. Compared with option 2a, however, option 5 reduces the subsidy for the second quintile by over 55%, much more than the 38% reduction for the top quintile. Like the interest rate options discussed above, it compresses the interest subsidy differentials for the top four quintiles, limiting the progressivity of the change.

OPTION 6: HIGHER MONTHLY REPAYMENTS PLUS A 3 PER REAL INTEREST RATE WITH PROTECTION AGAINST RISING REAL DEBT AFTER 5 YEARS. Specifically, this is option 1a combined with option 4. Compared with option 4, this hybrid saves an additional £790 per graduate across all quintiles (i.e. an average saving per graduate of £3,485 in option 6, compared with £2,695 in option 4), with most of the saving coming from reduced subsidy for the lowest quintiles – the loan subsidy for the upper three quintiles actually *increases* for option 6, compared to option 4 which has less strict repayment conditions (Tables 1 and 3).

OPTION 7: HIGHER MONTHLY REPAYMENTS PLUS A TWO-YEAR REPAYMENT EXTENSION. Specifically, this is option 1a combined with option 3, except that we lowered the cap on overpayment from 25 per cent of the loan to 20 per cent (unlike options 3a and 3b, under option 7, no graduate will repay more than 120 per cent of his/her initial loan). This hybrid is not only the most cost effective option that we model, recovering almost all of the initial £6,024 per graduate loan subsidy, but also one which, it can be argued, shares the savings in an equitable way. Average saving per graduate is significantly different from option 3a with a 3 year repayment extension (£5,900 for the hybrid option compared with £3,610 for option 3a, amounting to an additional savings of £2,290 per graduate).

Table 3: Loan subsidy under hybrid options for an average graduate with £20,235 debt, by quintile

	Lowest quintile **Non-repayment predominately because of write-off**	**Second Quintile** **Non-repayment because of write-off and interest subsidy**	**Middle quintile** **Non-repayment because of interest subsidy**	**Fourth Quintile** **Non-repayment because of interest subsidy**	**Top quintile** **Non-repayment because of interest subsidy**
Current System	53.4% (£10,800)	30.6% (£6,190)	26.2% (£5,310)	23.3% (£4,715)	19.5% (£3,950)
Option 5 (Option 1a + Option 2a)	32.8% (£6,640)	13.5% (£2,730)	12.1% (£2,440)	11.6% (£2,340)	12.0% (£2,430)
Option 6 (Option 1a + Option 4)	31.0% (£6,270)	9.3% (£1,885)	7.8% (£1,575)	7.9% (£1,610)	9.2% (£1,855)
Option 7 (Option 1a + Option 3a)[17]	30.3% (£6,130)	4.8% (£975)	-2.0% (Graduate overpays £410)	-8.6% (Graduate overpays £1,730)	-15.9% (Graduate overpays £3,210)

Source: Authors' calculations using data on salary paths from the Institute for Fiscal Studies.

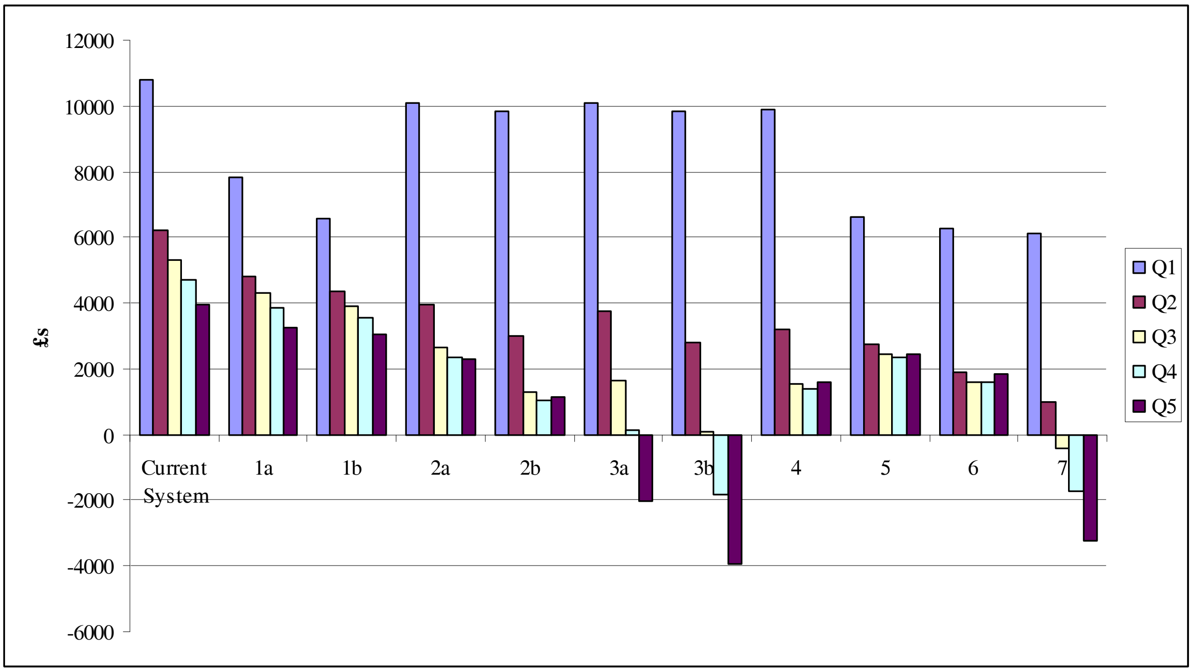
Table 4: Average savings by quintile for hybrid options (compared to current system)

	Lowest quintile	**Second quintile**	**Middle quintile**	**Fourth quintile**	**Top quintile**	***Average Savings per Graduate across three Quintiles***
Option 5 (Option 1 + Option 2a)	£4,160	£3,460	£2,870	£2,375	£1,520	***£2,805***
Option 6 (Option 1 + Option 4)	£4,530	£4,305	£3,735	£3,105	£2,095	***£3,485***
Option 7 (Option 1 + Option 3a)	£4,670	£5,215	£5,720	£6,445	£7,160	***£5,900***

Source: Authors' calculations using data on salary paths from the Institute for Fiscal Studies.

[17] For the hybrid repayment extension option, we place an over-repayment cap of 20% on all graduates; that is no graduate will over-repay more than 20% of their total debt.

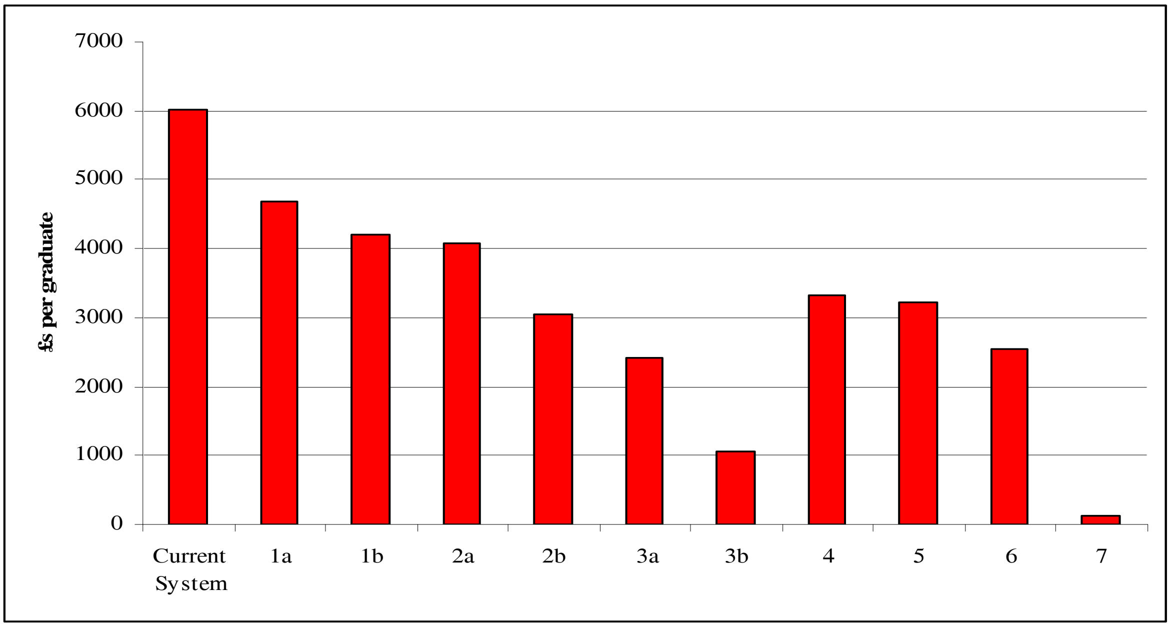
Figure 4: Value of loan subsidy (in £s) by quintile, current system and alternatives



Source: Authors' calculations using salary path data from the IFS.

Note: Option 1: Monthly repayments of 12% of income over (a) £12,500 and (b) £10,000.
Option 2: Positive real interest rate of (a) 3% and (b) 4%, where real debt does not rise
Option 3: Repayment extension of (a) 2 and (b) 3 years
Option 4: Positive real interest rate of 3% with real debt allowed to rise for first 5 years
Option 5: Option 1a + Option 2a
Option 6: Option 1a + Option 4
Option 7: Option 1a + Option 3a

Figure 5: Average cost per graduate of current system and alternatives (£ per graduate)



IN SUM. These various options, summarised in Figures 4 and 5, show the range of possibilities. Our innovative repayment extension contributes most to the elimination of the loan subsidy, with our hybrid repayment extension option nearly eliminating it. The various options contrast in the way they distribute the subsidy to the tails of the graduate earning distribution. Some options completely protect the lowest quintile, but only by forgoing significant cost-savings across all quintiles (options 2 and 4) or by imposing significant overpayment by the upper quintile (option 3a and 3b). The hybrid options mitigate both sets of problems, but at the expense of reducing somewhat the subsidy for the lowest quintile.

Box 5 briefly discusses the difference if the various options were based on a 2 per cent real interest rate, and explains the focus of this paper on 3 per cent.

Box 5: Charging a lower interest rate: How much difference?

As discussed in section 3.1, the real rate of interest on long-run government bonds over the past 25-30 years has been about 3 per cent. Over a longer period, for example the postwar period, the interest rate on average has been lower, so that some commentators argue that 2 per cent is a better approximation; for example, Dearden et al. (2010) estimate the cost of the interest subsidy relative to a government borrowing rate of 2.2 per cent. How much difference would a 2 per cent rate make?

As discussed throughout, the choice of interest rate has no effect on monthly repayments but only on the duration of repayments. Thus an interest rate of 2 per cent reduces the period of repayment compared with a 3 per cent rate. Charging the lower rate has no effect on the average earner in the bottom quintile of graduate earners, who qualifies for 25-year forgiveness, but reduces total repayments by the remaining quintiles, including the top quintile.

The objective is to design a loan scheme in which subsidies are well-targeted. This suggests an interest rate that fully covers the government's real cost of borrowing; as already discussed, we regard 3 per cent as the best estimate of that variable. A 2 per cent rate benefits better-off graduates with no change in the position of the least-well off, and is thus less well targeted than a 3 per cent rate coupled with 25-year forgiveness.

If 3 per cent were regarded as fractionally higher than the long-term real rate on government bonds, the model analysed here would introduce a small cohort risk premium, bringing an element of social insurance into the scheme. Saying the same thing a different way the scheme would incorporate a small amount of redistribution from richer to poorer graduates in a cohort.

Note that we are not proposing that graduates should be charged a 3 per cent real rate, but that they should pay an interest rate equal to the actual rate at which government borrows. The 3 per cent figure is intended to illustrate how the policy would work, rather than a prediction of what will actually happen.

For all these reasons, we prefer to frame the analysis in terms of the 3 per cent rate.

3.5 What can we do with the savings?

Options 1-7 all increase loan repayments, potentially freeing resources for other uses. However, those additional resources are not available for all purposes immediately.

Notwithstanding some of the complexities discussed more fully in Annex 1 the central point is simple. With income-contingent repayments, a higher interest rate does not increase monthly repayments but extends the duration of the loan. Thus the savings from a higher interest rate arise only at the end of the repayment period, that is say, in year 12, when repayments continue when otherwise they would have stopped. Using those future savings today to improve quality or widen access leads to increased public spending today.

In contrast, it is possible to use those future savings to expand the loan system today. Suppose that because of low lifetime earnings and the interest subsidy 50 per cent of all lending is not repaid (in present value terms). Thus total lending of £2 billion requires a reserve in public spending (the so-called RAB (Resource Accounting Budget) charge) of £1 billion. But if charging a positive real interest rate reduces non-repayment to one-third, the reserve of £1 billion can now support lending of £3 billion.

Thus, raising the interest rate on student loans makes it possible:

- To expand the loan system immediately, or
- To divert the savings to other uses in the future (e.g. from year 12 onwards).

4 Policy gains from reducing the interest subsidy

Reducing the blanket interest subsidy means that graduates will repay a larger fraction of their borrowing. A necessary precursor to the introduction of any such policy is a major information campaign to explain how income-contingent loans work, so that the electorate understands that raising the interest rate has no effect on monthly repayments; its only effect is that at some point in the future, usually 10 or more years down the line, repayments will continue when otherwise they would have stopped.

TOWARDS A SOLUTION.

- The ideal solution is to charge the government's cost of borrowing on all new loans. This might be a propitious time to do so. Interest rates are currently low; and as interest rates start to rise, people will realise that this has no effect on their monthly repayments, and understand that the effect of the higher interest rate is that repayments will continue somewhat longer some years in the future. A second reason for moving to a positive real interest rate on all new loans is as part of fiscal tightening that will have to occur once the worst of the 2009 recession is over.
- A less radical approach would phase in a positive real interest rate. One possibility would be to freeze the subsidised loan in nominal terms and charge the government's cost of borrowing on increases designed to maintain or increase the real value of the loan.
- A third approach would charge a positive real interest rate on extensions of the loan system, for example to part-time students, postgraduate students and/or students in further education. Such a policy, however, would evoke questions about why full-time undergraduates, alone, were heavily subsidised.

Note that in all these cases, the new regime would not be retrospective, but would apply only to new loans.

COMPARISON OF THE OPTIONS. The various options are summarised in Figures 4 and 5. In comparing, we start from two value judgements: lower earners should continue to be protected as much as possible; and average and higher earners should not benefit from interest subsidies. On that basis we rule out the following:

- The present system: as discussed in section 2.1, current arrangements are expensive, inimical to quality, quantity and access, and regressive.
- Option 1: higher monthly repayments: this option yields minor cost savings (£1,820 per average graduate in option 1b); in addition, these savings derive mostly from additional repayments from graduates in the lowest quintile, so the overall impact is regressive.
- Option 2: a higher interest rate with full protection against any rise in a person's real outstanding loan balance: under this option at politically realistic interest rates (e.g. the government's cost of borrowing), graduates in the middle and upper quintiles retain some of their interest subsidy. Option 4 reduces this problem and so dominates option 2.

The remaining options are:

- Option 3: a repayment extension with a maximum overpayment of 25 per cent: this approach allows the lowest quintile to keep all of their current subsidy. With a two-year repayment extension (Option 3a), average savings are £3,610 per graduate, reclaiming about 60 per cent of the subsidy under the current arrangements; the top quintile overpay by 10.1 per cent, but the middle quintile retain some of their subsidy. The latter problem can be rectified if the repayment extension is 3 years, but only at the expense of extracting an average overpayment of 19.5 per cent from the top quintile.
- Option 4: a positive real interest rate with real debt allowed to rise for the first 5 years: under this option the average saving is £2,695, i.e. reclaiming only 45 per cent of the subsidy under the current arrangements; the bottom quintile retains most of the current interest subsidy; the subsidy for the average graduate in the second quintile halves; and the average graduate in the three upper quintiles receives a subsidy of between 6.8 and 8.0 per cent.

Note that options 3 and 4 cause little change to the present system, since monthly repayments and methods of collection are the same. In addition, there is no change for lower earners who continue to qualify for forgiveness after 25 years.

If fiscal constraints make it necessary to derive at least some saving from lower earners, options 3 and 4 can be combined with higher monthly repayments:

- Option 6 (a combination of options 1a and 4) yields additional savings by reducing the subsidy to the bottom quintile, yet actually leads to a slight *increase* in the interest subsidy of graduates in the middle, fourth and upper quintile. The average saving under this option is over £3,485 per graduate, reclaiming 58 per cent of the current subsidy, although the average graduate in the second quintile receives the same subsidy as an average graduate in the top quintile, limiting the progressivity of this option.
- Option 7 (a combination of options 1a and 3a) saves £5,900 per graduate on average. Like option 6 it reduces somewhat the subsidy to the bottom quintile and also extracts some overpayments from the upper three quintiles. In lowering the cap on overpayment to 20 per cent, we also limit overpayment in the highest quintile, compared with options 3a and 3b. The result is more progressive than option 6, giving the second poorest quintile a greater subsidy, while providing the largest cost savings — 98 per cent of the current loan subsidy is reclaimed.

There is no unambiguously best choice between options 3, 4, 6 and 7. The optimal policy depends on the relative weights policy makers attach to (a) reducing public spending, (b) protecting graduates with low lifetime earnings, and (c) protecting the highest earners from repaying significantly more than they borrowed.

That said, the repayment extension has powerful advantages.

- It produces larger savings than a real interest rate, since the top quintile overpays.
- It produces those cost savings in a way which protects graduates in the lowest quintile, and is more progressive than a real interest rate for earning quintiles above the poorest.
- The combination of protection for the lowest earners together with good performance of the loans portfolio as a whole improves the prospects of private finance. Making

the same point a different way, this approach facilitates private finance by offering private lenders a capped equity stake in the graduate cohort.[18]

ADVANTAGES. Why, in conclusion, does any of this matter? It matters because adopting the government's cost of borrowing as the default interest rate in the loan system yields three strategic sets of advantages: the policy would remove a major price distortion in the system of higher education finance; it would have distributional gains; and it would sharply reduce the cost to taxpayers of the loan system, opening up highly beneficial educational options.

Gains from reduced distortions. If students, their families and government face an efficient inter-temporal budget constraint:

- Families will tend to make better decisions about the balance between loans and family support.
- Students will make better choices about the balance between loans and paid work; and they will no longer face incentives to take out a full loan even if they do not need one, so as to profit from the interest rate differential.
- Governments will make better choices about the size of loans and the range of students and qualifications for which loans are made available.

Distributional gains. Replacing a blanket interest subsidy by targeted subsidy removes an unintended and undesirable regressive element in student loans, eliminating a significant subsidy for rich graduate earners who do not need it. According to our estimates, the current system provides a subsidy of £3,950, about 20 per cent of the loan, to the average graduate in the highest quintile of graduate earners, raising problems of cost and of equity.

Gains from cost savings. Loans have two sorts of cost: cash-flow costs – money that is repaid – and fiscal costs – money that never comes back. Reducing the interest subsidy considerably reduces the fiscal cost; as noted, approximately one-quarter to one-third of all lending to students never comes back because of the cost of the interest subsidy. The consequential gains include the option to:

[18] Milton Friedman's original (1955) proposal was for equity finance, not loan finance.

- Increase the level of the loan to cover any increase in fees and to increase the maintenance loan: this is highly significant; one of the major impediments to any increase in the current fees cap is the fiscal cost of doing so. An increase in the fees cap would bring in more resources to promote quality. Also, and in the current economic climate perhaps more important than previously, it would reduce the incentive at the margin for universities to recruit non-EU students over home and EU students whose fees are capped.[19]
- Extend loans to part-time students, postgraduate students, and/or students in further education.
- Integrate loans into a strategy for lifelong learning.
- Sell loans to private sources on better terms than previously: in 1998 and 1999, the government sold two tranches of student debt of £1 billion each. In the second sale, it was estimated that value of the loan subsidy which Government had to pay to the private sector was between £395 and £405 million of the original £1 billion: the net present value of the cost of these subsidies had they remained in the public sector would have been only £310. Thus, the additional estimated cost of Government selling the 1999 tranche was £85 to £100 million or 25 to 30 per cent above the costs of keeping them in the public sector over the lifetime of the portfolio (House of Commons Research Paper 07/78, 2007: 15-16). If the aftermath of the financial crisis constrains the ability of government to finance cash-flow costs, selling debt is an option.[20] Charging a real rate of interest would facilitate better value for money when making the sale.
- In the medium term, finance broader policies to improve quality and widen participation, including action in nursery, primary and secondary education.

[19] 'Leading universities are drawing up plans to slash thousands of places for British undergraduates and replace them with foreign students paying far higher fees to cope with an expected cut in government funding of 20%-25%', *Sunday Times*, 20 September 2009, http://www.timesonline.co.uk/tol/life_and_style/education/article6841340.ece,

[20] Since income-contingent loans have no market track record, it would be desirable to sell small tranches initially to establish a market record. Not all commentators are optimistic about the likely proceeds of such debt sales (Shephard, 2010 puts forward a complementary proposal in which universities can charge higher fees, which they receive in the form of income-contingent loan repayments once the student has repaid his or her maintenance and fees loans).

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Annex 1: Student loans in the public accounts

Charging a positive real interest rate brings in more loan repayments, potentially freeing resources for other uses. The discussion here explores the resulting policy options in more detail, starting with brief discussion of the way student loans appear in the public accounts.

Student loans in the public accounts

This is a technical area bristling with acronyms intelligible only to experts. We are not experts. What follows is a very simplified stylised example whose only purpose is to explain why the savings from charging a higher interest rate are available for some purposes but not for others.[21]

For simplicity, assume that:

- Future interest rates, loan repayments, etc. are known, thus abstracting from uncertainty about the duration of repayments and the need to make adjustments over time;
- There is an off-budget loan fund from which loans are paid and to which repayments are credited;
- Repayments are income contingent;
- Lending to students in year 0 is £2bn;
- The future cost of non-repayment is £1bn – the combined effect of (a) the interest subsidy and (b) graduates with low earnings;
- Loans are repaid in years 1-25, non-repayment each year being £40m.

For any policy that involves future liabilities – whether student loans or early retirement payments – budget and accounting systems need to consider:

(a) The total lifetime or resource cost in net present-value terms of today's commitments; and

(b) The impact on the budget deficit this year and in future years.

The key control for the education budget is (a) – the resource cost – so that policy decisions take account of their impact on long-term costs and benefits. By contrast, the national accounts are built on (b) – the impact on the current budget – in order to measure the current budget deficit today and in the future.

In current terms, the cost of the interest subsidy appears as an increase in spending (called near-cash spending in Treasury documents) of £40m per year to compensate the loan fund for the cost of non-repayment that year.[22] Such spending increases current government spending.

In the resource budget, in year 0, a provision of £1bn appears as non-cash spending in the education budget, representing the present value of non-repayment over the life of the

[21] The description in the text assumes that loans are treated like any other provision or future liability in the public accounts. In reality, student loans are more complicated than ordinary provisions, but the description in terms of ordinary provisions is sufficient to explain the constraints on recycling savings.

[22] In reality, as noted, the treatment of student loans is more complicated.

loans made in year 0. This provision is known as the RAB (Resource Accounting Budget) charge. In the resource budget, the near-cash spending of £40m per year in the previous paragraph is offset by non-cash spending of £40m each year, representing the drawdown of the provision.[23]

Thus the cost of non-repayment appears as annual spending in years 1-25 in the current budget; in the resource budget, the cost of non-repayment affects resource spending in year 0 (the RAB charge) but, assuming that no adjustments are necessary, not in later years.

The effect of raising the interest rate on student loans

Consider the effect of increasing the interest rate on student loans. With conventional loans this raises monthly repayments immediately, and hence brings in extra resources immediately. With income-contingent loans, a higher interest rate does not increase monthly repayments but extends the duration of the loan.

Assume that:

- Raising the interest rate extends the duration of repayment for a representative individual from 11 years to 12.
- Because of these extra years of repayment, non-repayment falls from 50 per cent of all lending to one-third.
- Thus, continuing the previous example, the RAB charge falls to £667m, a non-cash saving of £333m.

Is it possible to use the £333m decline in the RAB charge for other purposes? It is useful to distinguish two cases: expanding the loan system, and other uses.

EXPANDING STUDENT LOANS. The system of loans could be expanded in various ways:

- A larger fees loans, matching any increase in the fees cap and/or increasing the maintenance loan;
- Extending loans to part-time students;
- Extending loans to postgraduate students;
- Extending loans to students in non-degree tertiary education.

Assume that the amount and timing of repayment and the extent of non-repayment are unchanged, and continue the previous example:

- If total lending rises from £2bn to £3bn, the necessary provision remains £1bn (i.e. 33% of total lending).
- Thus
    - There is no need to increase the RAB charge. Since non-repayment has fallen from 50 per cent of lending to 33 per cent, a RAB charge of £1bn can support an expansion of the loan system from £2bn to £3bn.

[23] 'The release of the provision scores as an equal and opposite (negative) amount in the non-cash resource budget. These last two near-cash and non-cash items net to zero in the resource budget' (HM Treasury, 2009, para. 2.46).

- Though lending rises from £2bn to £3bn in year 0, the loan fund is off budget.

DIVERTING THE SAVINGS TO OTHER USES. Examples of other spending include:

- Within education: more money for universities, promoting quality; higher spending on nursery education to widen participation.
- Elsewhere: higher spending on green public transport; public spending cuts.

Question: is it possible to recycle the £333m decline in provision to other uses? Answer: not automatically nor without Treasury permission. The key point is that the saving of £333m happens in the future (by assumption, the higher interest rate means that the repayments of a representative individual continue into year 12). Other things equal, enlarging the loan system is compatible with that timing. In contrast, spending on universities, nursery education, public transport or tax cuts increases spending now.[24]

The Treasury keeps tight control of conversion of non-cash into near-cash spending at the best of times, and particularly so given impending public spending constraints.[25]

THE BOTTOM LINE. Raising the interest rate on student loans makes it possible to expand the loan system. But with income-contingent repayments, the savings from a higher interest rate arise only at the end of the repayment period (in the example, in year 12). Using those future savings to improve quality or widen access today leads to increased public spending today. Though the two uses of the saving from charging a higher interest rate have the same present value, they have different time paths.

Thus raising the interest rate on student loans makes it possible:

- To expand the loan system immediately, or
- To divert the savings to other uses in the future (e.g. from year 12 onwards).

[24] The move uses future savings in non-cash spending (the additional repayments in year 12) into extra near-cash spending (e.g. on universities) today.

[25] 'Near-Cash within Resource Budget DEL is a control aggregate close to the measure of current spending that impacts on the current balance used to assess the temporary operating rule…. [D]epartments have to go through certain procedures if they wish to make significant increases in near-cash by transfers from non-cash within Resource Budgets.' (HM Treasury 2009, para. 1.25)