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Conceptual and empirical issues for alternative student loan designs: the significance of loan repayment burdens for the US

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Abstract

Ubiquitous concerns with US student loans are given conceptual context through a comparison of the two main types of student loans, those repaid over a set period of time, mainly used in the US (mortgage-type loans (MLs)), and those that are repaid depending on future incomes, used in Australia and England (income contingent loans (ICLs)). The major concern with MLs is illustrated with the use of what are known as 'repayment burdens' (RBs), the proportion of a debtor's income required to repay loans per period. RBs are fundamental to assessments of student loan systems, and must impact on debtors' consumption and default probabilities. We show that Stafford loans imply extremely difficult financial circumstances for a minority of US loan recipients, and that an ICL can solve these problems. The financial benefits of an ICL are illustrated through reference to a hypothetical student loan experience.

Keywords: Student Loan Design, Repayment Burdens, Income Contingent Loans

JEL Codes: H28, I22, I28, J24

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It is generally accepted that there are significant problems associated with US college loans, with both presidential candidates in 2016 highlighting the issue as in need of policy attention. This is a critical matter for college access among disadvantaged students, since an equitable and fair student loan system is essential to the attainment of educational opportunity. We are motivated by the view that student loan arrangements are in need of reform.

The conceptual discussion presented in this paper stresses the importance of risk and insurance in the provision of student loans. In this context, financial matters surrounding the ease or difficulty for debtors to repay their loans become paramount and we discuss these challenges by considering their ‘repayment burdens’ (RBs). RBs are the proportion of a debtor’s income in a future period that is required to repay a loan. If this proportion is low, say 5 per cent, it is not likely to be associated with financial stress and thus also unlikely to lead to default because of an inability to repay. But if a RB is high, say 50 per cent, it is very plausible that this obligation leads to major economic difficulties for a borrower, particularly if income is low.

In this paper we consider RBs from the perspective of economic theory by comparing two major forms of student loans: time-dependent repayment (such as those mainly the case in the US) and income-dependent repayment (such as those in England and Australia). The conceptual distinction is fundamental for federal student loan policy. The second type of loan arrangement, known as income-contingent loans, has major insurance benefits for borrowers simply because the RBs in these systems have maximum and low proportions set by law. The empirical work presented in this paper relates to calculations of RBs in the US. The analysis shows that RBs can be adversely high for low-income graduates. We then consider what RBs would be if the US mortgage-type student loan system was converted into an income-contingent loan system. The results show fairly clearly the benefits of such a potential transformation.

Why are student loans necessary?

Is it obvious that student loans are necessary to ensure that prospective students from disparate socio-economic backgrounds are able to finance the payment of college tuition? In a world in which the government paid all tuition costs on behalf of, and provided generous income support to, students, there would be no need for loans. But in the absence of very substantial subsidies of these forms there is a general recognition in the economics literature that there would be a considerable market failure, a point generally attributed to Friedman (1955).

This can be explained through consideration of what would happen if there were less than full higher education financing subsidies from the public sector. That is, a government convinced that there should be a part-subsidy for higher education could simply provide the appropriate level of taxpayer support to colleges and then leave market mechanisms to take their course. Presumably this would result in institutions charging all students upfront on enrolment for tuition. However, there would be major problems with this arrangement for prospective students without access to financial assistance because, for reasons now outlined, the private commercial market would be unwilling to be involved due to the potent presence of risk and uncertainty. Essentially, educational investments are risky, with the main areas of uncertainty being:[2]

(i) Enrolling students do not fully know their capacities for (and perhaps even true interest in) the higher education discipline of their choice. This means they may not graduate. In Australia for example, around 20-25 per cent of students end up without a qualification;

(ii) Even if students know they will graduate, they will not know their likely relative success with respect to employment and earnings. This will depend not just on their own abilities, but also on the skills of others competing for jobs in the area;

(iii) There is uncertainty concerning the future value of the investment. The labour market – including the labour market for graduates in specific skill areas – is undergoing constant change. What looked like a good investment at the time it began might turn out to be a poor choice when the process is finished; and

(iv) Many prospective students, particularly those from disadvantaged backgrounds, may not have much information concerning graduate incomes, due in part to a lack of contact with graduates.

These uncertainties are associated with important risks for both borrowers and lenders. If the future incomes of students turn out to be lower than expected, the individual is unable to sell part of the investment to re-finance a different educational path. For a prospective lender, the risk is compounded by the reality that in the event of a student borrower defaulting on the loan obligation, there is no available collateral to be sold, a fact traceable in part to the illegality of slavery. And even if it was possible for a third party to own and sell human capital, its future value might turn out to be quite low taking into account the above-noted uncertainties associated with higher education investments.

[2] See Barr (2001), Palacios (2004), Chapman, Higgins and Stiglitz (2014).

Thus, left to itself the market will not deliver propitious higher education outcomes. Prospective students judged to be relatively risky, and/or those without loan repayment guarantors, will not be able to access the financial resources required for both the payment of tuition and to cover income support. These capital market failures were first recognised by Friedman (1955) who suggested as a possible solution the use of a graduate tax or, more generally, the adoption of approaches to the financing of higher education involving the use of their human capital as equity. The notion of 'human capital contracts' developed from there and is best explained and analysed in Palacios (2004).

Without some form of intervention, higher education financing will not deliver socially efficient outcomes in aggregate, nor can such markets left alone deliver equality of educational opportunity because those without collateral (i.e., the poor) will be unable to participate. Consequently, in almost all countries, governments intervene in the financing of higher education to help prospective students invest in their own human capital. There are currently two major forms that this intervention takes, mortgage-type loans (MLs) and income-contingent loans (ICLs). The distinction between these approaches involves the conditions under which loans are repaid: MLs are repaid according to an agreed set time period, with ICLs instead being collected depending on the income of the debtor.

Higher education financing: mortgage loans (MLs)

MLs are a possible solution to the capital market problem associated with the funding of higher education and are used in many countries, such as the US, Canada and Japan. MLs involve higher education institutions charging upfront fees but with government (or bank) loans for both tuition and non-tuition expenses (e.g., books, supplies, living expenses, etc.) being made available to students. The amount available to borrow (e.g. in Canada) and/or interest rate subsidies for these loans during college (for example in the US) are on the basis of means testing of family incomes. Public sector support usually takes two forms: 1) the payment of interest on the debt before a student graduates (e.g. in the US for students from poor backgrounds as highlighted above) and 2) the guarantee of repayment of the debt to the bank in the event of default. Arrangements such as these are designed to facilitate the involvement of commercial lenders, and the fact that they are internationally a common form of government financial assistance would seem, inaccurately, to validate their use.

Until recently, the US college loans system was funded by commercial banks with guarantees provided by the federal government for payment in the event of a debtor's default. Public sector costs were likely reduced by moving the financing to the government (with Direct Loans). This change has not altered the essence of most US

MLs. Loan repayments depend on time, with the most common repayment period being set at ten years, such as is the case for the vast majority of Stafford loans. In the US college students may undertake non-ML loans, such as income-based repayments (IBRs), but the use of IBRs is not the default option for borrowers entering repayment. Use of IBRs has complexities in both eligibility and application requirements, as discussed by Dynarski and Kreisman (2013) and Baum and Johnson (2016). Our focus on the common form of US loans, which are MLs, seems to be a timely research strategy for policy. The two major issues for borrowers related to MLs are default risk and consumption hardship, now considered in more detail.

Default risks for students and government

MLs have repayment obligations that are fixed with respect to time and are thus not sensitive to an individual's future financial circumstances. This characteristic raises the prospect of default for some prospective borrowers, with default typically associated with severe damage to a borrower's credit reputation and eligibility for other loans, such as for a home mortgage.[3] Some prospective students may prefer not to take the default risk of borrowing because of these high potential costs. The possible importance of this form of 'loss aversion' is given theoretical context in Vossensteyn (2002).

There is also a distributional issue related to which students actually default. A considerable body of US evidence considers the determinants of default over about the last 20 years, and this literature consistently finds that debtors' incomes are a critical determinant of the likelihood of default.[4] From these analyses, borrowers from low-income households, and racial/ethnic minority groups, are more likely to default, as are those who did not complete their studies.

Nevertheless, it is an exaggeration to suggest that students with MLs have no alternative other than to default in circumstances in which they are unable to meet their repayment obligations. In the US, borrowers have some limited potential to defer loan repayments if they are able to demonstrate that their financial situation is unduly difficult, and in some cases this might lead to loan forgiveness for a limited period (and, as noted, there are some limited options for the current income-based repayment programme). Generally, however, there is no expectation that a ML repayment takes into account capacity to repay.

Shifting attention to the risks MLs pose to governments, there is little doubt that defaults are a major budgetary cost. It is these costs that explain why the governments of some countries choose to ration MLs, making them available to only around half of the

[3] See for example Barr (2001) and Chapman (2006).
[4] See for example, Dynarski (1994), Gross *et al.* (2009), Hillman (2014) and Looney and Yannelis 2016)

prospective student population.[5] Default rates for MLs are available for many countries, with Chapman and Lounkaew (2016) documenting these for the US, Canada, Thailand and Malaysia. The data suggest default rates of around 15 to 25 per cent for the US and Canada, and as high as 50 to 60 per cent in Thailand and Malaysia.

Repayment hardships for students

Arguably the biggest problem for debtors with MLs concerns potential consumption difficulties associated when repayments are fixed with respect to time (and thus unrelated to a borrower's capacity to pay). Even a borrower who is unlikely to default may face hardships during repayment if the proportion of income required to repay a ML is too high. The issue is repayment burdens (RBs), the proportion of a debtor's income per period that needs to be allocated to repay a ML.

For a given level of income, the higher the proportion of a graduate's income that needs to be allocated to the repayment of a loan, the lower will be the income available for other household consumption. With respect to the US, there is a considerable amount of evidence available concerning the RBs associated with Stafford loans. Baum and Scwartz (2006) and Looney and Yannelis (2016) show these calculations for a range of debtors with different incomes. Similar data are reported for Asian ML systems in Ziderman and Albrecht (1995). A limitation of these analyses is that RBs are usually presented for median graduate incomes, albeit in some cases with respect to different educational backgrounds defined institutionally.

Considerable empirical analyses of RBs associated with MLs have now been conducted in many different countries that present calculations across the entire range of graduate incomes.[6] These simulations use age smoothed unconditional quantiles (UQ) of income by gender, a major improvement over previous analyses and the approach adopted for the analyses in this paper. This UQ approach allows calculations of RBs across the whole distribution of graduate incomes by age and sex. It allows us to move from simplistic average or median estimates of RBs and to examine what MLs might mean for financially disadvantaged debtors.

With our approach, we are able, for example, to show RBs for graduates earning in the bottom parts of the income distribution. The international literature sheds light on RBs for graduates in the bottom 25 per cent of the income distribution of graduates by age and sex. In Vietnam, RBs are between 20 to 85 per cent (even graduates in the top 25

[5] Rationing may also reduce access for prospective students who are ineligible for loan assistance because their family incomes are too high but who are unable to secure financial assistance from within their household.

[6] See for example, Chapman and Liu (2013), Chapman, Lounkaew, Polsiri, Sarachitti and Sitthipongpanich (2010), Chapman and Suryadarma (2013) and Chapman and Sinning (2012), for analyses of Vietnam, Thailand, Indonesia and Germany, respectively.

per cent of the earnings distribution would have to spend between 14 to 17 per cent of their income in the first ten years to pay off the debt).[7] In Thailand, where the student loan scheme has a very large public subsidy, RBs range from 5 per cent to 30 per cent.[8] With respect to Indonesia, the simulation of a typical mortgage-style student loan scheme reveals that RBs would vary from around 30 per cent in a relatively high income area (Java), to around 85 per cent in a relatively low income area (Sumatra).[9] Even graduates in developed countries can face high repayment burdens, for example, up to 70 per cent for East German women who earn in the bottom 20 per cent of incomes of graduate East German women.[10] These estimates reveal that MLs are associated with very high RBs for low income young graduates in those countries. Below we present new evidence for the US using the UQ method.

Higher education financing: income-contingent loans

The primary benefit of ICLs is that, if properly designed, the arrangement avoids the problems outlined above with respect to MLs. ICLs simultaneously ensure against default and create a degree of consumption smoothing for debtors. For many countries, the administrative costs of collection of ICLs are very small. Some of the empirical consequences of the ICL system are summarised and commentary is offered on key points related to administration and design.

Consumption smoothing

Unlike MLs, ICL schemes offer a form of 'default insurance' since debtors do not have to pay any charge unless their income exceeds the pre-determined level. After the first income threshold of repayment is exceeded (e.g., 150 per cent above poverty), ICL repayments are capped at a fixed and low proportion of the debtor's annual income. By adjusting repayment based on borrowers' capacity to repay, ICLs offer a form of consumption smoothing: there are no loan repayment obligations when incomes are low, and a greater proportion of income is remitted to repay the debt when incomes are high. The removal of repayment hardships and the related advantage of default protection via income-contingent repayment address the fundamental problems for prospective borrowers inherent in mortgage-style loans. The protections of an ICL could particularly matter for both default probabilities of borrowers and loan revenues for governments in times of recession. That is, poor employment prospects at the time of graduation, such as was the case for many countries in 2008 to 2013, can mean high

[7] See Chapman and Liu (2013).
[8] See Chapman, Lounkaew, Polsiri, Sarachitti and Sitthipongpanich (2010).
[9] See Chapman and Suryadarma (2013).
[10] See Chapman and Sinning (2012).

defaults for debtors with MLs. MLs also place administrative costs on governments to collect defaulted debts. Under an ICL model where repayments are directly connected to incomes, and using employer-withholding, administrative costs are minimised.

Transactional efficiencies

As emphasised by Stiglitz (2014), governments can collect debts very inexpensively under an ICL repayment system if payments are tied to tax collection (or, more generally, through employer-withholding). Stiglitz refers to this administrative feature as 'transactional efficiency,' which can simplify the repayment process for debtors. This issue is given sophisticated theoretical support by Lochner and Monge-Naranjo (2015), who argue persuasively that an optimal student loan policy will be an ICL, but only so long as income verification processes are low cost.

Some analyses shed light on ICL collection costs. For Australia, the government estimates collection costs to be around $(US)33 million (2015 dollars) annually, or less than 3 per cent of ICL yearly receipts. To this figure, Chapman (2006) adds an estimate of the compliance costs for universities and comes up with a total administration cost of less than 5 per cent of yearly receipts. In collection terms, the system seems to have worked well and there are apparently significant transactional efficiencies in the use of employer-withholding for the collection of debt. Estimates of the costs of collection of the England and Wales ICLs are very similar (Hackett, 2014).

The Australian, English and New Zealand ICL collections all involve their income tax systems, the equivalent of the IRS. But this approach is not essential. While some US public policy analysts argue that the use of the IRS for collection poses difficult political issues for the institution of an ICL, all that is needed (as suggested by Dynarski, 2014) is employer-withholding of debts depending on an employee's income, such as currently operates through the US social security collection arrangement. The transactional efficiencies will be the same no matter which institution acts as the agency.

The reason behind these ICL transactional efficiencies is that the collection mechanism builds on an existing and comprehensive withholding mechanism, related to income tax, social security and/or medical insurance collections. If legal jurisdiction were granted to the private sector to be able to know citizens' incomes, it would seem to be the case that an ICL collection could be done by private agencies. However, it is difficult to imagine that a commercial entity could do this collection as cost efficiently as the federal government, simply because employer-withholding arrangements currently and comprehensively cover all wage and salary earners.

In the context of ICL policy, it is inevitable that there are unpaid debts associated with ICLs mainly due to debtor incomes being insufficient to involve full repayment over the life-cycle. In Australia these amounts are continually estimated by the Australian Government Actuary. Unpaid debt is typically projected to be of the order of 15-18 per cent of total loan outlays.[11] Unrepaid debt should not be classified as default *per se,* it is instead an inevitable consequence and cost of the insurance aspect of an ICL.
In addition, transactional, and other, efficiencies of ICL are not by definition associated with all income-contingent-type repayment systems, a point emphasised in Dynarski (2014). As is usual in public policy, it is the design features of instruments that determine their social benefits, and the current operation of the income-based collection in the US loans system has major and ineffective administrative features.

In this context, Dynarski (2014) argues compellingly that the income-based component of the plethora of student loan choices in the US is poorly designed policy because: the income basis of collection relates to what occurred in the previous year, and is not contemporaneous; there are major and recurring (annual) administrative demands placed on debtors to establish their eligibility; and, debt collection is not done automatically through employer withholding. These characteristics of the US approach stand in marked contrast to the English and Australian ICL processes.

Emphasising the key implications of ICL

The benefits of ICLs are so significant that they warrant stressing, with the major points being as follows. If properly designed, ICLs:

(i) Eliminate all prospects of default due to lower incomes;

(ii) Are associated with consumption smoothing and the eradication of loan repayment difficulties;

(iii) Can be associated with high aggregate repayments because debtors who would be removed from a ML after default from low incomes stay in the system until their incomes and thus their repayments recover; and

(iv) Are operational in all modern economies with minimal administration costs.

[11] Australian Government Budget Statements 2016–17, Budget Related Paper No. 1.5 Education and Training Portfolio.

Repayment burdens with US student loans

RBs are a crucial aspect of student loan design because they are associated with and reflect the difficulty or ease of meeting repayment obligations. With non-ICL systems, for example, standard Stafford loans, a person with a debt is required to repay a fixed amount of the loan each month for 10 years, irrespective of their financial capacity to do so. This means that debtors experiencing unemployment, or low earnings through non-graduation (a particularly likely outcome for debtors who did not complete their degree from the for-profit sector), will face high RBs and this will undoubtedly cause consumption hardship and in many cases lead to default.

Recently, empirical evidence has emerged concerning RBs in the US college loan system, as reported in Chapman and Lounkaew (2015), using 2009 data from the Current Population Survey (CPS). What now follows builds on this research, in two ways. First, we use the 2015 CPS (adjusted for inflation so that it is in 2016 $US). Second, our UQ method adopts a more flexible functional form, which results in more accurate, although similar, estimates to those reported in Chapman and Lounkaew (2015). Summary statistics for our raw CPS income data by sex and age in 2016 $US used to undertake our age smoothed UQ by gender are given in Table A1 in the Appendix.

What constitutes a problematic RB?

Before reporting US RB calculations, it is instructive to ask 'what constitutes a RB associated with adversity?' Baum and Schwartz (2006, 2) refer to the so-called '8 per cent rule,' a standard suggesting that '…students should not devote more than 8 per cent of their gross income to repayment of student loans.' Baum and Schwartz are critical of the 8 per cent rule and offer both a range of arguments related to the role of income and considerable consumption data. This evidence, backed up by analysis from Salmi (2003), implies that a more conservative RB (18 per cent of income) should be used as broad indicator of individuals experiencing difficulty with repayment of student loans. This can be taken as a cut-off for a maximum level of RB, below which the situation for a debtor can be considered not to be associated with either consumption hardship or high probabilities of default.

It is worth noting that any attempt to specify a 'repayment burden difficulty rule', such as 18 per cent of income in a given period, has an important arbitrary aspect to it. This is because the likelihood of debtors experiencing consumption hardship or facing a significant risk of default must depend not only on the proportion of income involved in repaying a debt, but also their absolute level of income. This appears to be a fruitful avenue for further research, but until this happens we are prepared to follow the literature and assess RBs of 18 per cent or more as being associated with important consumption difficulties for a debtor in the US.

RB calculation method

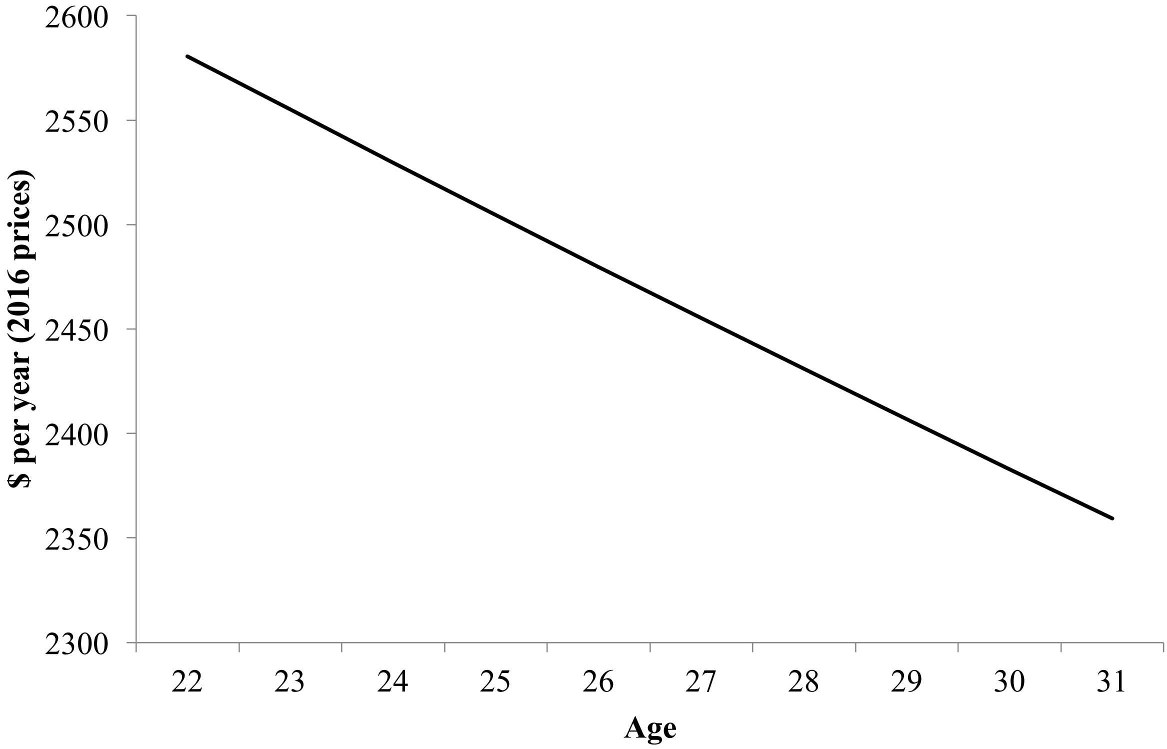
Education economists and others have been measuring RBs for more than a quarter of a century.[12] The RB is the proportion of a person's income that needs to be allocated to service a debt per period:

$$\textit{Repayment burden in period } t = \frac{\textit{Loan repayment in period } t}{\textit{Income in period } t}. \qquad (1)$$

The RB calculation has two separate steps: determining what the loan rules and a given level of debt imply for repayment obligations over the assumed ten-year period of collection (the numerator of Equation (1)); and calculating projected incomes in the future (the denominator of Equation (1)). As far as the first is concerned, what is reported below relates only to the typical Stafford loan arrangements, reported in Dynarski (2014) and for debt levels of $20,000 for all BA graduates.[13] It is assumed that debtors finish their studies in minimum time and start repaying at the beginning of their careers, and are assumed in our calculations to be age 22. The annual loan repayment obligations are shown in Figure 1.

[12] See Woodhall (1987), Ziderman and Albrecht (1995), Schwartz and Finnie (2002), Salmi (2003) and Baum and Schwartz (2006).
[13] This is roughly the average debt of all college students in the US.

Figure 1: Loan Repayment Schedule for Stafford Loan of $20,000



Loan repayment obligations are shown in real terms and this is why they decline over time, as the nominal repayments are constant for each year of the ten-year repayment period. The annual repayment obligation is between $2,350 and $2,580 in 2016. For the denominator, and following the broad approach of Chapman and Lounkaew (2015), we use a range of different estimates of incomes using our UQ technique. This approach has the major benefit of illustrating what RBs are projected to be in the lower parts of the graduate income distributions, such as for example, the bottom 10 and 20 per cent of incomes for graduates of the same age and sex.

To illustrate how potentially important the disaggregated approach to the estimation of the income denominators might be for the RB calculations, Figures 2 and 3 show the age-income profiles for females and males for quite different parts of the overall graduate income distributions: Q10, Q20 and Q50, which are respectively incomes for the bottom 10 and 20 per cent, and the median incomes of BA graduates up to the age of 50, assuming one per cent real income growth per year.

Figure 2: Age-Income Profiles, Females (2016 $US)

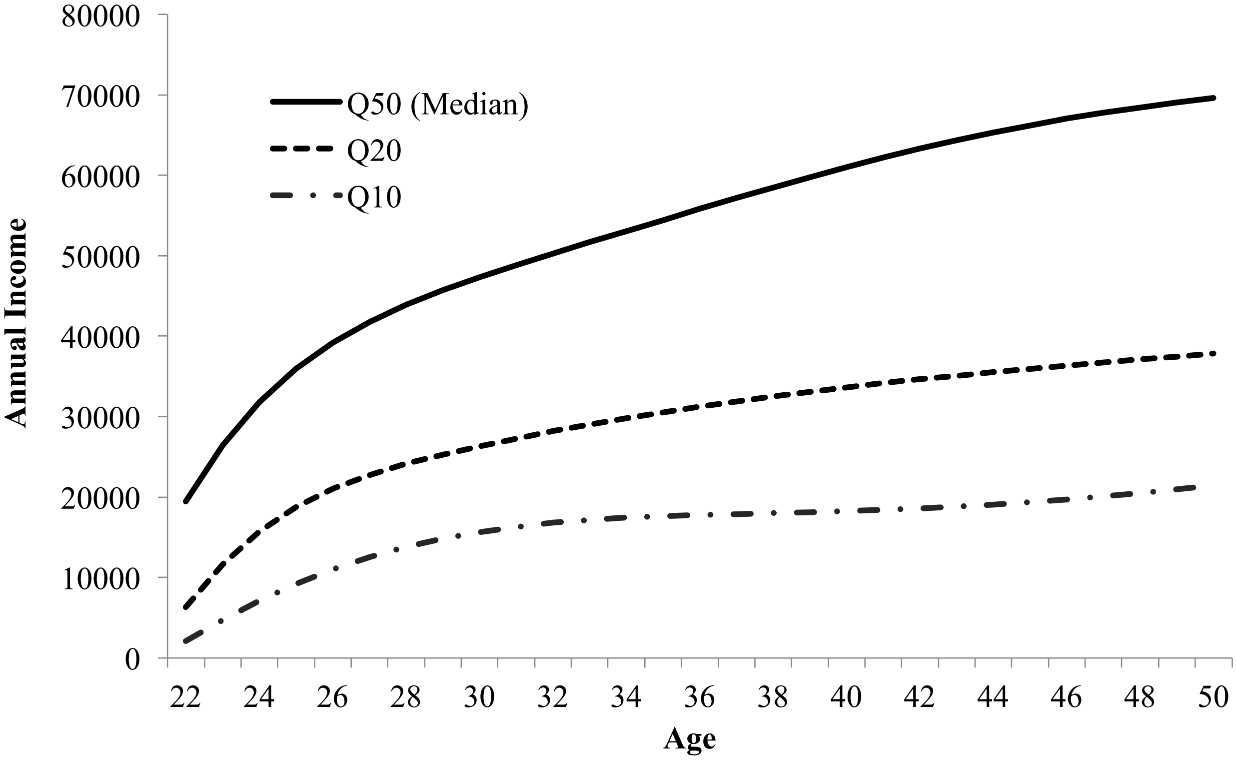
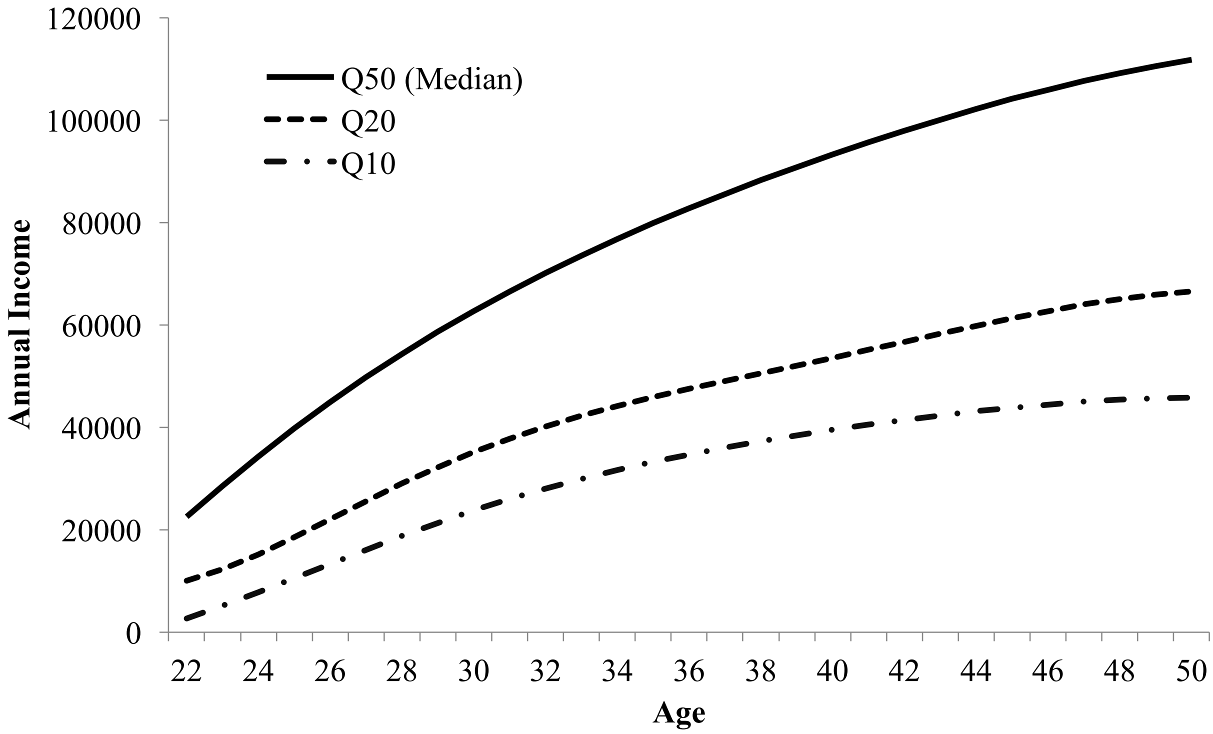


Figure 3: Age-Income Profiles, Males (2016 $US)



Figures 2 and 3 illustrate the importance of calculating RBs for different parts of the graduate income distribution, as the projected incomes of graduates have such a large variance and also very different age profiles. For both women and men, those in the bottom 10 per cent of the distributions of BA income are receiving less than one third of median BA graduate incomes. Even those in the bottom 20 per cent of graduate incomes receive about half only of the median income recipients.

RB results

With both the numerator and the denominator available, we are able to calculate the RBs for female and male graduates. The actual data are available in Table A2 and Table A3 in the Appendix.

Figure 4 shows that for the lowest income (Q10) graduate women, in the first year after graduation the RB actually exceeds, and are still around 14 per cent of income in the final year of expected repayment of the loan. For those women at the bottom 20 per cent of graduate incomes, RBs begin at 41 per cent of incomes, falling to around 10 per cent after a few years. Those women receiving median graduate incomes have RBs of around 13 per cent, and these RBs reduce to about 5 per cent at the end of the expected repayment period.

Figure 4: RBs for Females by Age with Stafford Loan of $20,000

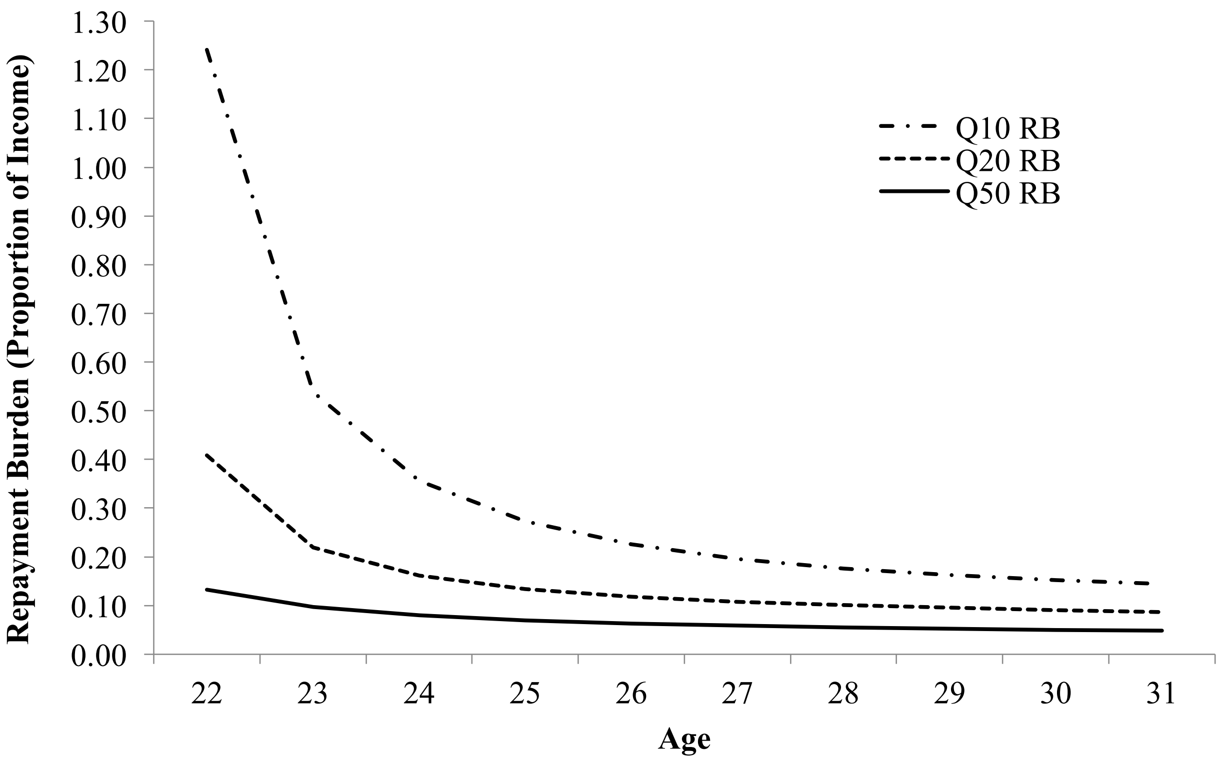
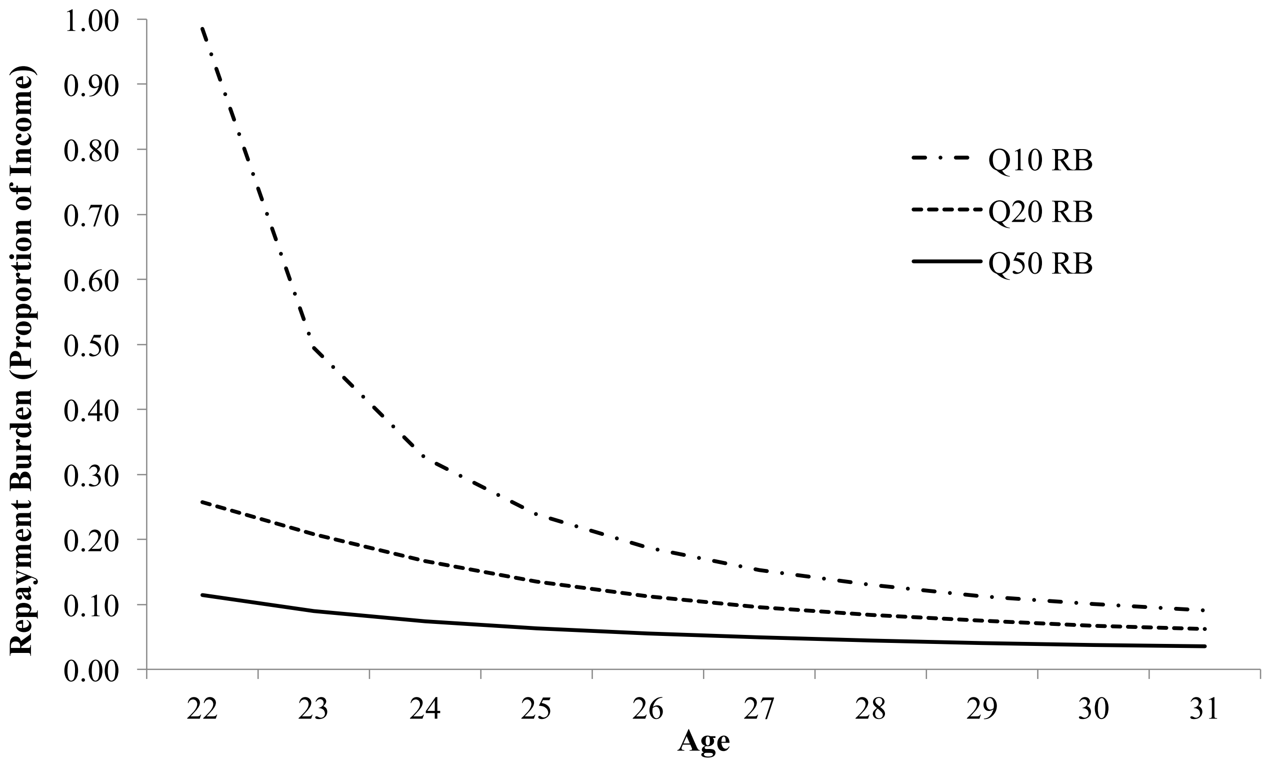


Figure 5 shows that for the lowest income (Q10) graduate men, RBs are around 100 per cent in year 1, and remain at or above 20 per cent for the first six years after graduation. For those at the bottom 20 per cent of graduate incomes, RBs begin at around 25 per cent of incomes, falling to between 6 to 11 per cent after a few years. Those men receiving median graduate incomes have RBs of around 11 per cent, and these reduce to around 4 per cent at the end of the expected repayment period.

Figure 5: RBs for Males by Age with Stafford Loan of $20,000



There is an additional issue from these results, which is also found in the Chapman and Lounkaew (2015) estimates. For graduates of either sex, RBs will be moderate or low for the majority of Stafford loan borrowers. The issue, however, has profound potential implications for graduates receiving low and very low incomes, even if only for a short period of their expected repayment periods. It is not credible to believe anything other than that the lowest income graduates will experience consumption hardship and fairly high probabilities of default as a result of their Stafford loan repayment obligations. The Stafford loan programme includes a provision that allows debtors in financial stress to defer loan repayments for a short period of time, up to a maximum of several years. However, eligibility for this deferment is neither automatic nor straightforward administratively, and many commentators argue that it is not a useful form of insurance against repayment hardship.[14]

[14] See for example Dynarski (2016).

Our estimates reveal that a minority of debtors will experience relatively poor financial situations and will prospectively face dire loan circumstances. A high RB is usually not related to the size of the debt as such, but rather the low incomes of debtors.[15] The critical point is that these problems can be avoided with well devised ICL systems.

Illustrating the effects of an ICL for the US

Given both the conceptual discussion on the comparative characteristics of MLs and ICLs, and the empirical evidence on US Stafford loan RBs, a natural question is: What might be the effects of making ICL the default repayment plan in the US? We now address this issue through the construction of a hypothetical graduate teacher, which allows us to calculate RBs for a $35,000 loan.[16] This exercise compares the RBs from the Stafford loan system with what would eventuate if instead the debtor had borrowed under an ICL, with our ICL simulation based on which we describe in full below. It is instructive to begin with a description of the existing ICL student loan arrangements.

[15] See for example Dynarski and Kreisman (2013).
[16] This is a relatively high, but not unusual, Stafford loan level available and about $7,500 more than the average debt level for a Georgian student on a 4 year BA programme. Average debts for Georgian Students on 4 year programmes in 2015 was $27,754 – see http://ticas.org/posd/map-state-data#overlay=posd/state_data/2016/ga.

Designing a hypothetical ICL for the US

The experience with English and Australian ICL systems provide a template to help design a hypothetical ICL for the US.[17] The analyses requires establishing the following parameters:

(i) The first income threshold of repayment, below which no repayments are required and any other threshold(s) above which a higher repayment rate applies;

(ii) The repayment rate(s), defined as the per cent of a person's current annual income allocated to loan repayments;

(iii) The annual interest rate on the loan; and

(iv) The maximum number of years of repayment after which there is forgiveness; and

(v) Whether there is an ICL loan surcharge (or, equivalently, an upfront fee paying discount).

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[17] Universities in England and Australia operate in the public sector with tuition charges set by government. While fee levels have changed considerably over the last 20 years, currently they are:

(i) A maximum of GBP 9,000 (USD 11,000) per full-time student year in England, irrespective of subject (over 95 per cent of institutions charge this amount); and

(ii) Between about AUD 6,000 (USD 5,500) and AUD 9,000 (USD 7,000) per full-time student year in Australia depending on the course studied, there being three tiers (for example, law and medicine are in the top and arts and humanities the bottom tiers).

In both systems, upon enrolment domestic students choose between paying tuition up-front or deferring their obligation through an ICL system. In England, the ICL arrangements also provide means-tested loans to cover living costs. The vast majority (85 per cent in Australia, 90 per cent in England) choose to defer repayments, and a student's debt is recorded and linked to his/her unique social security/tax file number. When a borrower starts work, employers withhold loan repayments based on the borrower's current income in the same way they withhold social security payments and income tax. Outstanding debt is recorded and reconciled within a government agency.

In both countries, borrowers have no loan repayment obligation unless their incomes exceed a certain amount: GBP 21,000 per year (USD 26,000) in England and AUD 54,000 (USD 40,000) per year in Australia. Above these thresholds loan repayments are an increasing proportion of income, but cannot exceed 9 and 8 per cent of incomes, respectively in England and Australia. When the loans have been fully repaid repayment collections cease; this takes a median time of about 8-10 years in Australia and about 25-28 years in England (where average debts are much larger and collections are slower), although the variance in the time taken to repay is considerable. For England, all outstanding loans are forgiven after 30 years. Both systems charge interest, and both include an element of interest subsidies.

Multiple objectives should inform the choice of these parameters. ICLs are designed to deliver both consumption smoothing and default insurance, as well as providing fiscal parsimony with low levels of taxpayer subsidy. Higher interest rates and/or loan surcharges reduce taxpayer subsidies but have different distributional implications with zero real interest rates and a loan surcharge the most progressive for the cohort of borrowers (Barr *et. al* 2016). For these reasons the choice of parameters will depend on:

(i) The relative weights given to these different objectives;

(ii) The choice of the other parameters, since they will interact with each other; and

(iii) The level, distribution and projected rate of change of graduate earnings.

How might such a system work in the US? As an illustration only, Barr *et al.* (2016) offer the following possible ICL parameters for a US system:

(i) A first income threshold of repayment of $25,000 per annum and a second threshold of $40,000 (both uprated annually with inflation);

(ii) A flat 3 per cent repayment rate on total income above the first threshold and 6 per cent above the second threshold;

(iii) An interest rate equal to the government borrowing when earnings are above the first threshold; zero real interest rate otherwise including during college (i.e., debt increases with inflation only);

(iv) A loan write-off after 25 years; and

(v) A loan surcharge of 10 per cent.[18]

Following Dynarski (2016), the collection apparatus is assumed to be employer withholding of loan repayments on the basis of current income, in much the same way as the collection of social security contributions now operates in the US. Loan

[18] In Barr *et al.* (2016) this is the surcharge needed to make this ICL scheme involve a ten per cent taxpayer subsidy for the entire BA employee cohort. This calculation ignores two year college students, self employed graduates, graduates who do postgraduate study and those who drop out who will do less well in the labour market. Hence the scheme we are illustrating would likely involve a greater taxpayer subsidy if these groups were also included. Most ICL schemes in other countries involve a taxpayer subsidy of at least 15 to 20 per cent. If there were no loan write-off, the ten per cent taxpayer subsidy surcharge for BA graduates would be 4 per cent.

repayments would be sent to a government unit to be reconciled with an individual's outstanding debt. We assume the government cost of borrowing is the 10-year bond rate plus ¼ of a point and apply the current rate of inflation.[19]

Comparing repayment experiences of ICL with Stafford loans

As with the RB calculations reported above, two pieces of data are required for the exercise: the characteristics of the loan (i.e., interest rate and repayment rules), and projections of the hypothetical lifetime incomes of the debtor. We begin with the income scenario. Our hypothetical person is a graduate teacher, 'Susan,' who finishes a four-year degree in education at Georgia State University in Atlanta at the age of 22. She wants to be a high school teacher, but enters the labour market when teaching jobs are very hard to find, a little bit like the circumstances of the recent great recession. The following features of her life and income are assumed:

(i) Susan is unemployed for much of the first year after graduation (in and out of temporary jobs), and for much of the time only receives food stamps to the value of $130 per month;

(ii) Her luck changes, and she begins work as a full-time high school teacher after 12 months, earning the first year high school teacher salary of $41,000 per year, and stays in this circumstance for the next 18 months;

(iii) Susan's mother becomes seriously ill when Susan is age 24 so she decides to leave teaching to look after her mother. She is able to claim unemployment insurance for six months (paid according to Georgia's rules). Because of the medical needs of her mother, she decides to take a part-time retail job (25 hours a week) for the other six months of the year, earning the median salary of female retail workers in Georgia;

(iv) At age 26 Susan resumes work as a full-time teacher and after that receives salary increments that reflect Georgian high school teacher median increments;

(v) At age 28 Susan has a child and decides to stop teaching. She has no partner but is able to use six weeks of accrued sick pay as income. She then earns a modest income looking after two other children during school hours; and

[19] The Stafford interest rate of 3.78 per cent nominal is the government cost of borrowing plus 2.05% points and hence 1.78% points higher than a real interest rate of one per cent (assumed in our ICL example) with one per cent inflation.

(vi) She returns to work at age 32 when her now healthy mother is able to help with childcare duties and enters at her previous increment level and from this point on receives median increments once more.

Figure 6 shows what these assumptions mean for the projection of Susan's income to the age of 50.

The next step in the calculation of the RBs for the two types of loan systems involves the annual loan repayment obligations in dollars. These are shown in Figure 7 for a $35,000 total loan repaid according to both the Stafford ten-year loan arrangement and the hypothetical ICL parameters set out previously.

Figure 6: Teacher's Annual Income (US$2016)

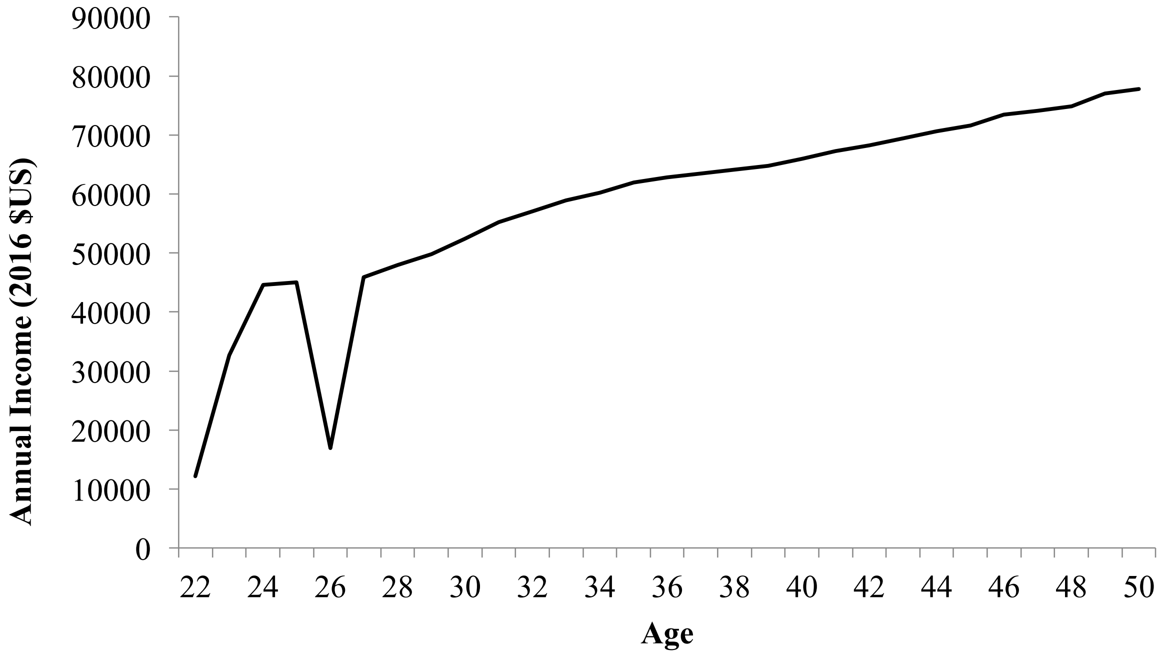


Figure 7 shows that, with the Stafford loan, around $4,100 to $4,500 per year (in 2016 $US) must be repaid for the ten-year period from when the graduate is age 22 to 31, after which there are no further repayments. With the ICL, the repayment streams and levels are quite different. In the years of Susan's unemployment, part-time work, and caring for her child, no repayments are required and, up until the age of 25, repayments range between $0 and $2,700 per year. It is only when she is back in the labor market as a full-time teacher after the birth of her child that her repayments rise above $3,000 per year. The ICL takes just over 20 years to repay, because the early annual repayment amounts are less than those associated with the Stafford system, particularly when Susan is not in work. Annual repayment amounts only approach, though never reach, Stafford levels when she is a relatively high earning teacher in her early forties. Combining the data from Figures 6 and Figure 7 allows the calculation of the RBs for each of the loan systems. The results are shown in Figure 8.

Figure 7: Loan Repayment Schedules: Stafford and ICL

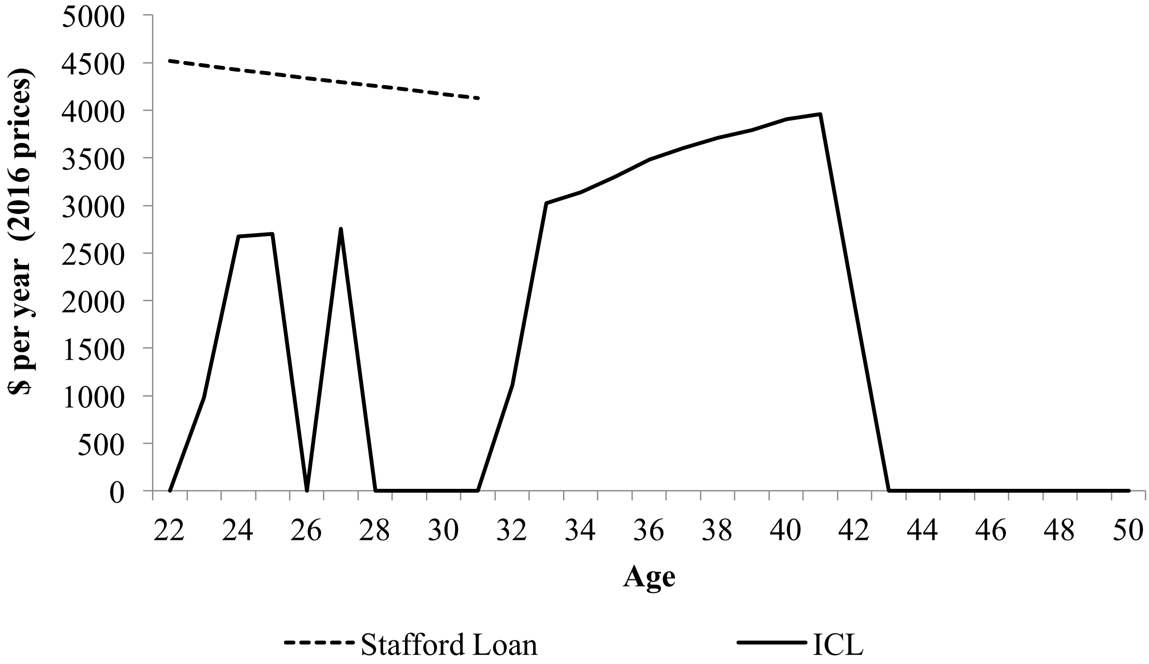
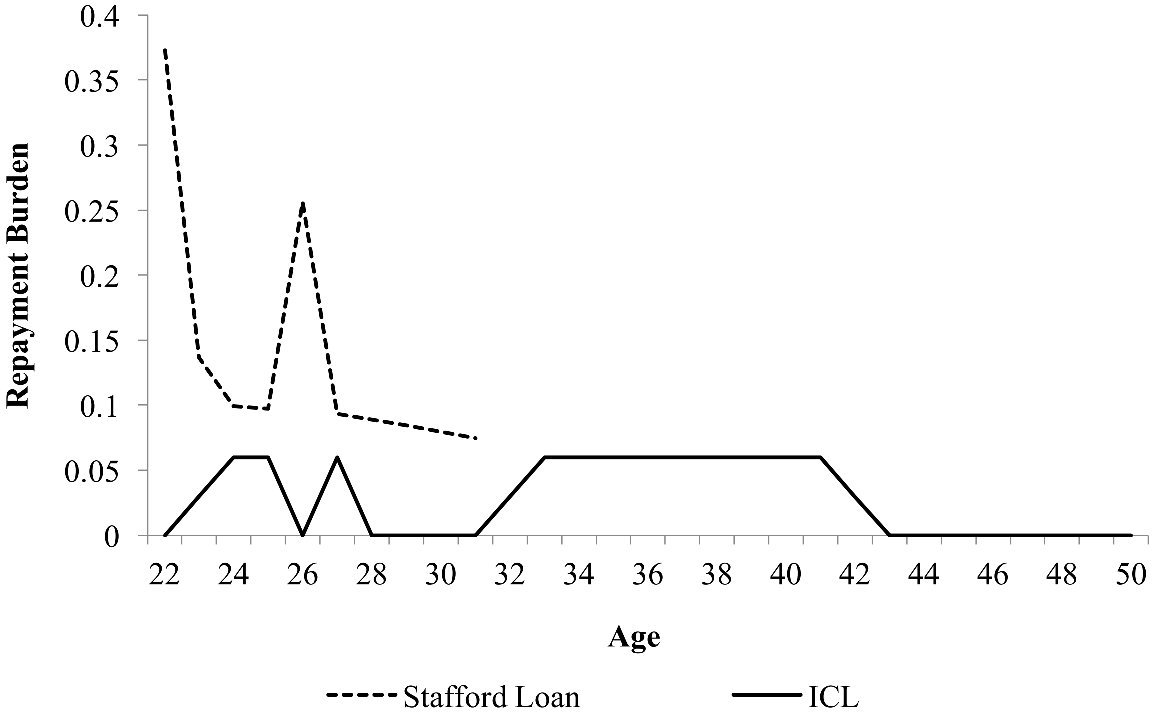


Figure 8 reveals very different repayment experiences under ML and ICL for a somewhat low-income female graduate in the US. Because the Stafford loan system constrains repayment to be concluded within ten years, the RBs begin at a daunting 37 per cent of income, fall then to about 10 per cent when teaching full-time work is resumed, but then jump again to 26 per cent when the first teaching employment stops. The RB averages around 14 per cent of income for the ten years. In contrast, with the ICL, RBs do not exceed 6 per cent per annum, and in all non-teaching years they are zero because Susan's income is below the first income threshold of $25,000 per annum. She has two years where the RB is 3 per cent (when her annual income falls between $25,000 and $40,000). In this example, the ICL adds just over 10 years to the length of the loan term but ensures that the RBs are always manageable. Susan pays around 107 per cent of the government cost (in net present value terms) of the loan with the ICL, which is less than the 114 per cent she would pay with the Stafford loan (presuming she doesn't default).

Figure 8: Teacher Loan Repayment Burdens by Age: Stafford and ICL



These exercises illustrate the consumption smoothing properties of ICL and offer highly visible evidence that MLs must be associated with relative (and absolute) repayment hardships for low-income graduates with Stafford loans. As well, with RBs of this magnitude, the probabilities of default for Stafford debtors are likely quite high. Indeed, it is hard to imagine how debtors being required to use 30-40 per cent of their (low) incomes would be able to avoid defaulting; those with an ICL loan are obviously highly protected from this problem. Of related interest for taxpayer subsidies, the ICL appears to also offer some insurance to taxpayers, since debtors are more likely to remain solvent and able to repay their debt in full.

Conclusion

There are profound problems associated with US student loans policy that can be traced in large measure to the expected difficulties faced by many students in repaying their debts. So-called ‘repayment burdens’ are critical to understanding the effects of a student loan scheme because of their implications for consumption hardship, default probabilities and educational and occupational choice, as well as family formation decisions. There is arguably no more important issue for the design of student loan systems.

Anticipated RBs are a function of loan size, interest rates and, critically, the future incomes of debtors. A significant proportion of student debtors can expect to face repayment difficulties if they end up in the lower parts of the income distribution, a possibility which is likely to be high for debtors who don’t acquire a college degree. RB concerns are not an issue in countries that have ICLs, such as England and Australia. The English and Australian ICL systems rule out loan repayment difficulties through policy design. ICLs are characterised by what economists call consumption smoothing and provide complete insurance against the adverse exigencies that can lead to default. There are no undesirable consequences in terms of credit reputation loss for low-income debtors who are unable to meet repayment obligations, as this situation is not treated as default in ICLs. On the other hand, in systems such as used in the US (and many other countries), default incurs longlasting and adverse credit reputational costs.

The conceptual discussion and empirical exercises reported in this paper suggest a way forward for the US student loans debate. Equitable reform would recognise the benefits of moving away from the current mortgage-based and toward a universal income-contingent student loan system. The fact that many US analyses such as in Dynarski (2016) and Stiglitz (2014) argue strongly for this position sits comfortably with all we have found.

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Appendix

Table A1: Summary Statistics for Raw CPS Income Data by Age (2016 $US) – Employees with BAs

Age	Males			Females		
	Mean Income	Standard Deviation	Number of observations	Mean Income	Standard Deviation	Number of observations
22	31271	32693	64	24091	20930	124
23	30956	25545	154	27416	21936	212
24	37513	31122	218	31584	19932	268
25	52989	66560	234	36274	24352	274
26	47090	33618	214	40059	27997	283
27	54541	49631	225	41727	22720	262
28	54366	37438	242	42629	25514	283
29	60443	68717	232	43658	26389	255
30	65591	64921	248	44872	30033	269
31	67149	49875	213	47967	36867	259
32	67071	41497	257	47394	31818	270
33	73289	48395	236	48459	30826	243
34	80659	82564	241	53019	75706	272
35	82380	72713	258	52150	33948	265
36	90396	118167	197	59590	66715	252
37	96511	101706	226	60333	76785	250
38	90740	67694	215	53491	34526	227
39	87704	72274	226	53515	40205	224
40	94384	92788	225	53966	33931	234
41	81854	50925	202	59815	41048	263
42	83390	63373	232	64591	80823	246
43	93356	92955	240	62799	59466	234
44	100564	103174	230	60298	74979	294
45	98646	82971	252	57473	43994	262
46	87443	61699	230	66241	85659	246
47	108730	90495	225	65258	65345	255
48	101538	96595	204	55777	39688	247
49	99088	77240	200	60816	38177	195
50	110911	134275	215	59254	55423	249
All	78377	77807	6355	51165	49548	7217

Source: Current Population Survey, CPS Certification Items Extract File 2015. All data has been put in 2016 $US using an assumed inflation rate of 1 per cent.

Table A2: RBs Female Stafford Loan of $20,000

Age	Stafford Annual Repayments	Q10 Annual Income	Q10 RB	Q20 Annual Income	Q20 RB	Q50 Annual Income	Q50 RB
22	2580	2,079	1.24	6,324	0.41	19,470	0.13
23	2555	4,747	0.54	11,656	0.22	26,431	0.10
24	2530	7,107	0.36	15,706	0.16	31,798	0.08
25	2505	9,181	0.27	18,737	0.13	35,946	0.07
26	2480	10,982	0.23	21,007	0.12	39,185	0.06
27	2455	12,517	0.20	22,745	0.11	41,766	0.06
28	2431	13,796	0.18	24,133	0.10	43,889	0.06
29	2407	14,836	0.16	25,302	0.10	45,704	0.05
30	2383	15,662	0.15	26,337	0.09	47,324	0.05
31	2359	16,303	0.14	27,287	0.09	48,826	0.05

Table A3: RBs for Male Stafford Loan of $20,000

Age	Stafford Annual Repayments	Q10 Annual Income	Q10 RB	Q20 Annual Income	Q20 RB	Q50 Annual Income	Q50 RB
22	2580	2,620	0.98	10,022	0.26	22,519	0.11
23	2555	5,162	0.49	12,298	0.21	28,542	0.09
24	2530	7,776	0.33	15,168	0.17	34,270	0.07
25	2505	10,473	0.24	18,455	0.14	39,705	0.06
26	2480	13,230	0.19	21,967	0.11	44,850	0.06
27	2455	15,998	0.15	25,520	0.10	49,713	0.05
28	2431	18,713	0.13	28,967	0.08	54,300	0.04
29	2407	21,313	0.11	32,197	0.07	58,622	0.04
30	2383	23,751	0.10	35,149	0.07	62,692	0.04
31	2359	26,003	0.09	37,798	0.06	66,526	0.04

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