To Whom It May Concern:

What follows is a submission to the Senate Inquiry into the Higher Education and Research Reform Amendment Bill 2014. The critical aspect of the submission is contained in the attached document, which covers interest rate options to charge on HELP debt. The content of this paper should be clear but by way of emphasis we wish to stress several points:

(i)   The key criticism of bond rate indexation is that it leads to inequity between borrowers. This is because the interest accrued by graduates with lower incomes or who experience periods out of the labour force (for example, to raise a family) will exceed the interest accrued by graduates with higher incomes and longer periods of continuous employment. This inequity can come about in particular when the interest applied to the loan in a particular period exceeds the compulsory repayments made.

(ii)   Loan surcharges or hybrid arrangements are both superior to the proposed bond rate indexation in terms of borrower equity, but there are advantages and disadvantages of the different arrangements. The preferred approach may depend on the level of future tuition fees, and the importance that the Government places on eliminating interest rate subsidies for new debt.

(iii)   Some key points follow:

   a. Under a loan surcharge nobody's debt can increase in real terms after the debt is incurred. Although a hybrid arrangement does not guarantee this outcome, it is unlikely that the real debt will increase under a hybrid scheme except in those cases where tuition fees are extremely large.

   b. A loan surcharge offers cost certainty for the student/graduate, and this may be an important consideration in mitigating debt aversion and in encouraging participation in an environment of increasing fees. In contrast, a hybrid scheme does not provide the same level of certainty for the borrower, because indexation rates move with the bond rate (when income exceeds the 4 per cent repayment threshold).

   c. A loan surcharge *does not* have to be that modelled and reported in the Interest Rate paper of 25 per cent. An advantage of a surcharge noted by the Department of Education is that it could be chosen to eliminate interest subsidies. However, the level required to eliminate interest subsidies is dependent on expected bond rates and tuition fees. Although preliminary calculations indicate that 25 per cent may be sufficient to eliminate subsidies if tuition fees remain at current levels (adjusted for inflation), if fees double, then the surcharge required to eliminate interest subsidies *would need to be greater than 25 per cent*. A key point is that the Government faces cost uncertainty when choosing an appropriate surcharge level, particularly in an environment of fee deregulation.

   d. If fees remain at current levels, or rise by a modest amount, then a hybrid indexation arrangement or appropriately chosen fixed surcharge could produce similar outcomes in terms of costs and equity. For current fees (and assuming 5 per cent bond rate), while a 25 per cent surcharge would be required to eliminate interest subsidies, a surcharge of closer to 10 per cent would produce outcomes for

the Government and for borrowers that are similar to the hybrid arrangement. A key point is that there is a trade-off between costs to the borrower and costs to the Government.

e. If fees rise considerably, then under a hybrid arrangement the costs facing lower earners will be markedly higher than the costs facing higher earners. That is, the ability of a hybrid scheme to provide equity among the cohort of borrowers diminishes as tuition fees increase (see Figure A9 in the attached Interest Rate paper). A loan surcharge avoids these inequities.

f. If fees rise unevenly, such that some disciplines result in $30,000 degrees while others cost $90,000, then choosing an appropriate indexation regime to improve equity becomes more difficult. It is certainly the case that a flat surcharge generates better equity than a hybrid scheme within a cohort of borrowers; however, the absolute level of repayments can potentially be much greater. The difficulty is choosing an appropriate surcharge level to suit variable fee amounts. As an example, the surcharge required to eliminate interest subsidies for a degree of $60,000 is approximately 32 per cent under some simple assumptions. However, if this surcharge is also applied to those with $30,000 degrees, then the real repayment costs to the majority of borrowers with these degrees (including those at median income) will likely exceed the costs that they would otherwise face under bond rate indexation. That is, setting a surcharge level based on the costs and outcomes for one group of borrowers may adversely impact on the costs for another group. This may be a particularly important consideration if there is a relationship between the tuition costs of a degree and the income earning potential of graduates.

g. The Government has stated that it intends to apply new indexation arrangements to existing as well as new debt. A surcharge is not able to be applied to old debts, and while it would be possible to do so with a hybrid indexation arrangement, we believe that changing indexation arrangements for existing debt (or indeed other scheme parameters, such as income repayment thresholds) is unethical.   We agree with Associate Professor Jeannie Paterson, University of Melbourne (as reported in *The Australian*), that for a government to change the interest rate on old HECS debt is tantamount to a bank announcing to a customer that the formerly agreed interest rate contract for a fixed interest loan is now being changed in the bank's favour. Such retrospective changes, if they go ahead, will also auger poorly for the confidence that future students would have in the fairness of the HECS system and have to be strongly resisted.

h. It would be administratively very easy (and currently exists in the form of FEE-HELP) to impose a loan surcharge. In contrast, applying a hybrid arrangement would require more investigation and discussions with the ATO.

(iv)   Summarising the above points and the attached Interest Rate paper, if fee deregulation proceeds and fees rise considerably for the majority of degrees, then a loan surcharge is likely to be superior to a hybrid indexation arrangement. If, on the other hand, fee deregulation does not occur, or if it occurs but the rise in fees is not excessive, then a hybrid arrangement and surcharge could produce similar equity improvements. The key risk of applying a surcharge is the uncertainty in setting a 'correct' level given

uncertainty in future fee levels. Regardless, both options provide greater equity among the cohort of borrowers than bond indexation, and the costs facing Government of both can be kept very low relative to the cost of DNER.

While the issue of "fee deregulation" is not addressed in this paper, it is a matter that we would like to comment briefly on here. While the level of government subsidies implicit in having particular charges for tertiary education is a matter for policy, it needs to be recognised that at some point the charges set by institutions could well exceed the actual costs involved in teaching, and potentially by considerable amounts. Some part of this possible outcome could be attributable to the existence of the insurance and consumption smoothing aspects of the use of an income contingent loan mechanism such as HECS.

It could thus be the case that the imposition of the policy designed to protect students and graduates from the adverse exigencies of the education and labour markets actually facilitates change that impacts unfairly and inequitably on the citizens it is designed to assist. This is in part a consequence of the fact that students wanting to acquire Australian higher education qualifications must do so in the confines of a monopoly loan system, a fact and circumstance that requires careful and considered handling by the government.

Thus, under the contemporary HECS situation explained above we are very concerned about the apparent haste and seeming lack of expert consideration of the many complex and potentially inequitable outcomes implicit in the suggested radical fee deregulation agenda that makes up the Commonwealth's plans. It would have been, and remains clearly the case, that a more cautious and considered approach is a preferred public policy stance and one that is still feasible.

Increases in price caps to allow greater contributions from students, without compromising some essential and highly desirable characteristics of the current arrangements, would be practicable and, moreover, would allow a considered assessment of impacts without compromising the prospects of further future reforms.

Finally, we wish to also urge the Committee to consider the matter of foregone revenue resulting from those with repayment obligations avoiding repayments as a result of being overseas. If fees increase, then the amount of foregone revenue 'lost' overseas will also increase. We believe that the arrangement for the collection of overseas debtors' obligations favoured in our paper 'The Costs of Unpaid Higher Education Contribution Scheme Debts of Graduates Working Abroad' (published in *The Australian Economic Review*, vol 46, no.3, pp286-99) is currently the mechanism used in New Zealand, and suggest that future policy attention be directed to assessment of that experience.

With kind regards

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HELP Interest Rate Options: Equity and Costs

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Abstract

This document presents analysis and discussion of the implications of bond indexation on HELP debt. This is done with respect to the costs and equity for borrowers, and interest rate subsidies for the government. The report investigates alternative options including hybrid indexation and a loan surcharge. We report on the costs to borrowers and the costs to government as a consequence of charging loan interest that differs from the cost of borrowing (these costs are referred to below as the 'interest subsidy'). It is apparent that:

(i)   The use of the bond rate is regressive;

(ii) The two alternatives suggested, the hybrid and the surcharge, are both associated with a significant diminution of the regressivity associated with using the bond rate;

(iii) A surcharge of 25 per cent, after which the debt is adjusted for changes in the CPI, has no regressivity;

(iv) Hybrid arrangements become more regressive as the loan size increases. In particular, for loans as large as $90,000, hybrid rates would be substantially more regressive than a loan surcharge.

(v)   The costs to the government of the replacement of the bond rate with either of the two suggested interest rate alternatives are around 4 to 6 per cent of the cost of the loan for a loan of $60,000. In our view these subsidies are small relative to the cost of non-repayment of debt based on current loan parameters;

(vi) There is less cost certainty for Government under a fixed surcharge than under a hybrid rate, but under a surcharge there is greater equity and certainty in repayment obligations for student borrowers.

(vii) The hybrid could be associated with potentially high administrative costs compared to the use of the surcharge; and

(viii) A surcharge of greater than 25 per cent could be used to eliminate all interest rate subsidies, but the level required is dependent on the new debt levels which are currently unknown.

1   Introduction

An important issue for Australian university funding policy concerns the rate of interest applied to the income contingent loan system used in the recovery of tuition debt, the Higher Education Loan Program (HELP). However, since the inception of HELP (previously known as HECS) in 1989 the issue has received close to no analytical or political/policy attention because for the last 25 years debts, once incurred, have always been adjusted to changes in the Consumer Price Indexation; this has ensured that the loan carries a zero real rate of interest for all debtors. Such an arrangement has meant that HELP debts provided an interest rate subsidy because the government's cost of borrowing would always exceed price inflation.

Nonetheless the issue of the rate of interest on HELP debt is no longer quiescent because the 2014/15 Budget proposes that the debt be adjusted not to the CPI but to the long-term government bond rate, thus effectively removing the interest rate subsidy. This is a controversial issue for policy and one that requires careful analysis because of the potential implications for equity and distributional fairness, as well as what it means for the size of the public sector seen in the context of a clear government strategy to reduce outlays. What follows offers the results of econometric and actuarial analysis of this issue, with a focus on three main questions for the debate:

(i)   What are the implications of indexing HELP debt to the government bond rate for the incidence of borrowing costs with respect to debtors' incomes? That is, will the new arrangement disadvantage former students with relatively low future incomes and, if so, what is the size of this distributional consequence?;

(ii)   Are there alternative interest rate regimes to the use of the bond rate for all debtors that mitigate the likely distributional implications and also achieve reductions in the extent of the subsidies associated with the current system?; and

(iii)   What are likely to be the budgetary costs of the adoption of alternative indexation regimes that have lower adverse consequences for distributional fairness?

As background it is useful to put into context the reasons for the initial, and continuing, application of the rate of price inflation to HELP debt. The essential reasoning behind this policy decision relates to equity, and it is to subsidise HELP debtors who experienced relatively low future incomes. This is achieved because every period for which debt is outstanding is a period in which the borrower effectively, albeit implicitly, is receiving a subsidy equal to the difference between the change in the CPI and the government's cost of borrowing. The critical point for equity is that, since relatively low income borrowers will take longer to repay a given debt, members of this group are subsidized the most.

Perhaps the most significant group being offered protection with the current HELP interest rate adjustment are students who enroll and thus incur a debt, but do not complete their studies and graduate. Former students in this category will on average not receive the lifetime incomes of typical graduates and for this reason an interest rate subsidy is progressive within the cohort of borrowers. The point is pertinent in an overall understanding of the motivation for income contingent loans (ICL) such as HELP, since the main purpose of this form of loan is an insurance instrument (Chapman, Higgins and Stiglitz, 2014).

The HECS interest rate subsidy was an important aspect of the distributional protections afforded those who experience poor and unforeseen educational and/or lifetime income circumstances. Similarly, HECS was designed to provide subsidies for debtors who spend time unemployed, or not in the labour force because of choices related to the rearing of children.

The methods used in the analysis now reported are familiar to all education and labour market researchers and involve projections of lifetime incomes estimated from cross-sectional data[1]. In order to address issues of distribution we go a step further than the usual approach of estimating ordinary least squares regression, a procedure which provides results only for the mean of the sample. Instead we employ non-parametric estimation techniques which allow us to explore the effects of different interest rate regimes for the tails of graduate income distributions.

Our analysis reveals the following:

(i)   The use of the bond rate means that relatively low income debtors who repay their debt will effectively pay more in real terms for university tuition than high income debtors;

(ii)   The extent of the repayment penalty depends on the size of the debt and thus the level of tuition charges resulting from the likely uncapping of charges from 2016;

(iii)   Debtors taking time out of the labour force will incur real loan costs as a result and will therefore generally pay more for tuition than others;

(iv)   There are available at least two interest rate regimes other than the universal application of the bond rate that mitigate the regressivity of the proposed policy; and

(v)   The costs to the Budget of alternative approaches to the charging of interest on HELP can be calculated and appear to be relatively small, although this judgment is obviously one for policy makers to make.

2   Data and Method

2 (i) Data: The 2011 Australian Census

We have used the 2011 Australian Census of Population, which has the distinct advantage of a very large number of observations. This means that those interested in the effects of the interest rate regimes on loan repayment outcomes have available to them a very large number of potential disaggregated analyses, such as with respect to location and occupational categories. While we have explored some of these dimensions this report only considers very broad outcomes.

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[1] The authors have considerable experience in the use of these techniques involving at least 20 published papers in the area.

The method used is explained below and requires information on individuals' age, education and income. Table 1 shows the main statistical characteristics of the data used in the analysis presented in this report. The data presented are for graduates who are employed either full-time or part-time.

Table 1
Statistical Characteristics of the Data: Number of Individuals, Estimated annual Income and Age

Age group	Number of individuals	Age	25th percentile	50th percentile	75th percentile
20-24	137,901	25	$ 33,483	$ 48,470	$ 60,145
25-29	284,344	30	$ 41,739	$ 60,680	$ 81,188
30-34	240,335	35	$ 42,018	$ 66,254	$ 89,445
35-39	209,593	40	$ 42,743	$ 68,508	$ 92,861
40-44	172,571	45	$ 44,548	$ 69,119	$ 92,168
45-49	140,568	50	$ 46,922	$ 70,442	$ 90,992
50-54	126,006	55	$ 47,227	$ 70,979	$ 89,988
55-59	91,719	60	$ 40,310	$ 64,374	$ 87,080
60-64	49,011				

2 (ii) Estimating disaggregated lifetime incomes

The defining characteristic of an ICL such as HELP is that every debtor has a unique repayment stream because debt obligations are not set by time but depend instead on future incomes. Thus in order to infer loan repayment streams for debtors in particular categories it is necessary to project expected lifetime income streams. We are able to achieve this through the non-parametric estimation of age-income percentiles, a technique which necessitates decisions concerning sample selection with respect to sex, education, income groupings and employment status.

We have carried out analyses separately by sex and for highly disaggregated income distributions, although we report the findings aggregated across sex, for all employed graduates and three income categories (the 25, 50 and 75th income percentiles). We have also limited the analysis to graduates and have excluded individuals not in employment, an issue addressed further below. We assume that graduates remain at the *same* income level and do not transition between income levels or to different states of employment. For example, a new graduate at the 25th percentile of income at age 22 is assumed to remain at the 25th percentile of income for the remainder of their life. The exception to this assumption is considered in Section 3(iv) where we allow for a period of interrupted employment. When projecting income levels into the future, the income data have been adjusted to take into account future changes in nominal wages[2].

To illustrate the sort of income structures revealed by the data, Figure 1 shows the age-income profiles estimated on the sample of men in full-time employment, disaggregated

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[2] Assumed to be 4.2 per cent per annum, which is equal to the average annual growth rate in total earnings over the last 10 years.

into three categories, the bottom and top 25 per cent of income, and the median income group.

The profiles reveal the usual concavity in age-income relationships, and suggest that median male graduates will receive incomes of around $100,000 a year around 10 years after graduation. Also, it is clear that there are very significant differences in income structures; for example, after age 35 those in the 75th percentile receive incomes that are around 70 per cent higher than the incomes received by those in the 25th percentile. Our analysis of female graduates revealed very similar structures and relativities, although female graduate incomes are lower than those of males. The results, broadly speaking, are quite consistent with a plethora of studies and provide some confidence that the empirical basis of the study is robust.

Figure 1
Projected 2016 age-income profiles (full-time male graduates).
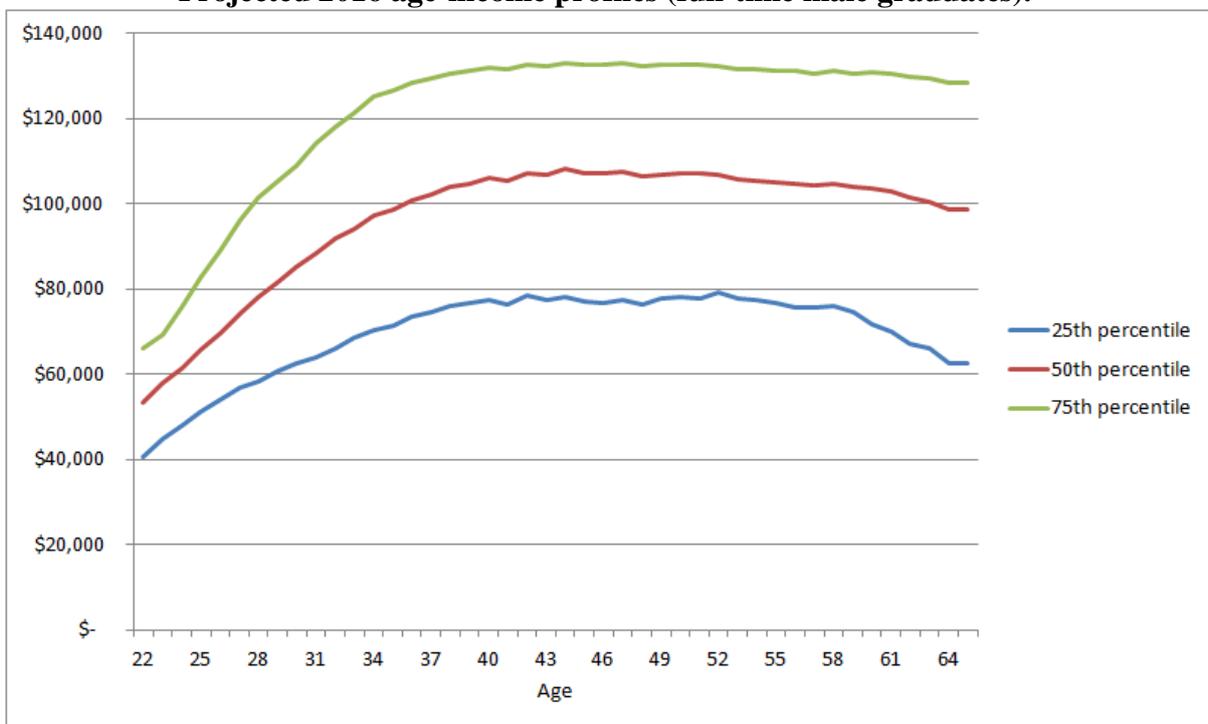
Source: Author calculations from 2011 Census

2 (iii) Calculating loan repayments by borrowers

The method we have used in calculating loan repayments involves the following steps:

(i)   On the basis of a given size of HELP debt (which is allowed to vary) use the HELP collection parameters to calculate the required loan repayments on the basis of projected income[3] at each point of time in which debt is being repaid;

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[3] The collection parameters are those proposed in the Budget and are given in Appendix 1. HELP income thresholds are increased with wage inflation when estimating future repayments. For the calculations presented here we assume that students complete university and commence employment at age 22 and retire from all employment at age 65.

(ii)   On the basis of interest rate adjustments formulate the actual required loan repayments and the time involved in repaying;

(iii)   Calculate a total loan repayment amount for assumed levels of projected incomes;

(iv)   Compare the loan repayments in real terms for particular income groupings and interest rate regimes; and

(v)   From the calculations determine the implicit levels of interest rate subsidies for particular income groups and alternative interest rate regimes.

The method for estimating government financed interest rate subsidies is now explained.

2 (iv) Estimating government interest rate subsidies

The empirical process explained above will result in estimates of the total loan repayments for specific income groups under different interest rate regimes. These data can then be used to estimate the per student loan repayments in present value terms, and these can be compared to the government's cost of borrowing in financing the loan systems. The meaning of these numbers can be explained with reference to the following illustration.

In a situation in which all debts are repaid when HELP has a rate of interest equal to the bond rate there is a zero subsidy, since the cost incurred by the borrower is the same as the cost incurred by the lender. With other interest rate arrangements this will not be the case, and the extent of the subsidy will depend on the difference between the interest rate paid by the borrower compared to the cost of financing the loan incurred by the government. Thus the subsidy is given by the gap between the revenue received by the government using bond rate indexation and the revenue received by the government with alternative interest rate regimes.

2 (v) Interest rate options

In what follows we have modeled three different interest rate regimes, which are as follows:

(i)   The application to all HELP debt of the government's cost of borrowing, which is assumed to be the 10 year bond rate. We have assumed that this is 5 per cent per annum in nominal terms, which is the average bond rate over the last 10 years;

(ii)   A hybrid model based on the current English ICL interest rate arrangement which indexes loans in line with the CPI when debtors' incomes are below the first threshold of repayment of the debt, and with the bond rate when debtors' incomes are above the first threshold of repayment of the debt[4]. This system substantially reduces the chance of real increases in the debt principal; and

(iii)   The application of a loan surcharge, assumed to be 25 per cent of the debt (although it could be higher or lower than this), after which the outstanding

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[4] More precisely, we have used the first income threshold of repayment in which 4 per cent of income is to be repaid. This will be around $56,000 per annum in 2016. CPI is projected to be 2.7 per cent per annum which is the average over the last 10 years.

principal is indexed to the CPI. This regime is familiar in the Australian ICL context because it is essentially the current FEE-HELP policy which applies to post-graduate and private institutional use of HELP[5].

Options (ii) and (iii) have the potential advantage over option (i) of mitigating the likely regressive impact associated with the application of the bond rate across the board. As well, the surcharge option is both familiar and administratively straightforward, having been used in the Australian higher education financing system for a long time. It is also likely to be the most progressive of all the possibilities, because debtors taking longer to repay – low income graduates – will be subsidised the most, however, the level of subsidy and the costs to borrowers depend critically on the size of the surcharge. Furthermore, for policy assessment it is important that these advantages are juxtaposed with the lower government loan receipts associated with the non-bond rate alternatives.

3   Results: Loan Repayments by Borrowers and Interest Subsidies Paid by the Government

3   (i) Introduction

What is now presented is a small subset of the many calculations presented to illustrate the distributional incidence of real loan repayments and interest rate subsidies given different interest rate regimes. The three arrangements are those explained above and are referred to as "bond", "surcharge" and "hybrid". We have examined different parts of the lifetime income distribution and these are referred to as "low", "medium" and "high" with "low" always applied to the bottom 25-40 percent of the income distribution, "medium" being the median income and "high" being the 75th percentile[6]. The results are presented for the total sample used with disaggregation by sex being available but not included here[7] and only for one level of loan, which is $60,000. All the calculations have been replicated for what are considered to be low loan levels of $30,000 and high loan levels of $90,000 and these are shown in Appendix 2.

3 (ii)   Results: Loan Repayment Burdens

Figure 2 shows the repayment amounts (in 2016 dollars) for all graduates[8] for different income levels.[9]

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[5] It is also in effect the basis of the original HECS design, which involved a 15 per cent discount for up-front payments. This is equivalent to requiring those taking the debt to incur a surcharge.

[6] For technical reasons related to the non-repayment of debt for some low scenarios it is apposite to vary the precise empirical classification used for this scenario. These decisions have no bearing on the essence of the results.

[7] The structure of results are identical for men and women with the findings for the latter always entailing lower repayments.

[8] The cohort of 'all graduates' used in these calculations includes all persons with a bachelor degree who are either part-time or full-time employed. This excludes those students who incurred a HECS-HELP debt but who did not complete their degree, and it also excludes those with debt who are out of the labour force or unemployed. We have excluded non-employed graduates for three reasons. First, since our model doesn't allow for transitions between labour force states, under our model an individual who is not employed would be assumed to remain not employed for their lifetime. However, panel data shows that the majority of graduates who are not employed in their 20s and 30s (for example when raising children) undertake paid work later in life. Second, research by Higgins and Sinning (2013) has shown that ignoring mobility across income bands and

Figure 2
Borrower repayments (2016 dollars). All graduates (loan = $60,000)
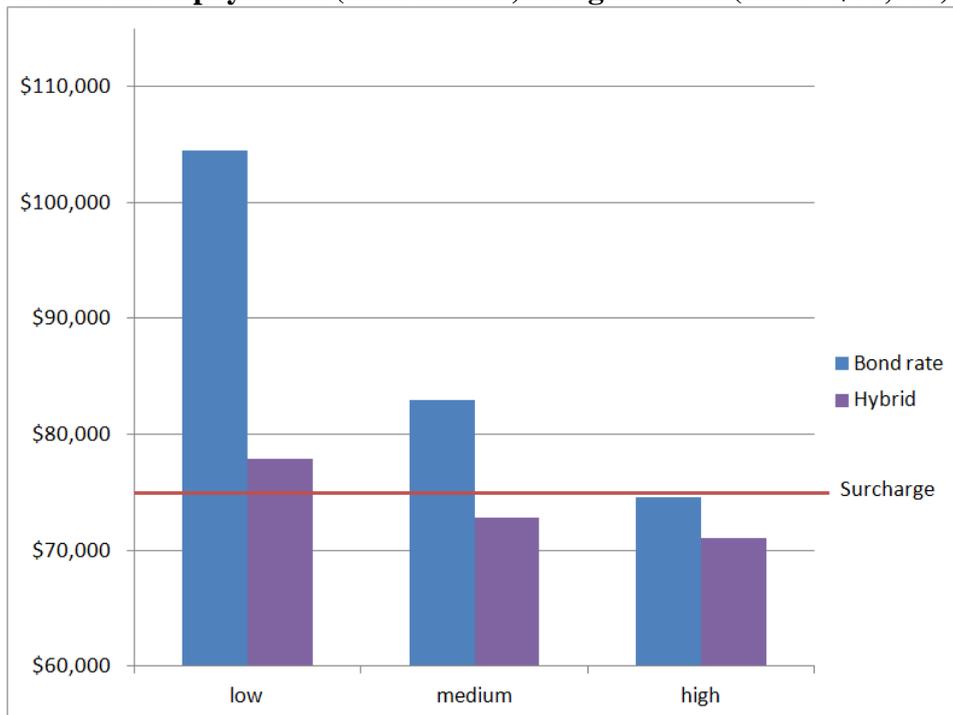
The main points are, for the same tuition charge of $60,000:

(i)   If debt is indexed at the bond rate, low income graduates pay considerably more in real terms over their lifetimes than median income graduates, of the order of 20 per cent greater;

(ii)   If debt is indexed at the bond rate, median income graduates pay considerably more in real terms over their lifetimes than high income graduates, of the order of 10 per cent greater;

(iii)   It follows from (i) and (ii) that low income graduates pay considerably more in real terms over their lifetimes than high income graduates, of the order of 30 per cent greater;

(iv)   The hybrid interest rate regime very significantly reduces the distributional inequity involved in the use of the bond rate and while it still results in low income graduates paying more for their tuition than others, the difference in real repayments between the low and high income graduates falls to less than 10 per

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labour force states can overestimate Government subsidies by as much as 10 per cent. Excluding graduates who are not employed reduces the cost estimates, thereby offsetting some of the over-estimates expected by the modeling approach that we have adopted. Third, using this graduate pamendation and our model, our estimates of Government doubtful debt under current HECS-HELP scheme arrangements are similar in magnitude to those produced by the Australian Government Actuary based on their dynamic micro-simulation model.
⁹ Low, medium and high income corresponds with the 30th, 50th and 75th income percentiles. For this example, the 30th income percentile also corresponds with the lowest income at which a graduate is projected to repay their debt in total under bond indexation. This implies that this is the income at which a borrower would take the longest time to repay and therefore accumulate the highest repayment under bond indexation.

cent and the difference between the low and median income graduates is reduced to about 6 per cent; and

(v)   The surcharge results in identical real lifetime loan repayments for all borrowers (who repay their debts) and thus reduces to zero all differences in real loan repayments between income groups.

Figure A8 in Appendix 3 displays the costs to the borrower and to the Government under the different indexation options for *all* incomes. A detailed explanation of how to interpret this type of plot is given in Appendix 3.

3 (iii)   Results: Interest Rate Subsidies

What now follows in Table 2 are interest rate subsidies for different lifetime income scenarios calculated for all graduates. While the data are presented here for only the $60,000 loan level, similar results are shown in Appendix 2 for loans of $30,000 and $90,000. Because subsidy calculations necessarily must take into account the time flows of repayments the data are presented in net present value terms discounted at the bond rate (meaning that there would be no interest rate subsidies if the bond rate is used for loan indexation).

Table 2
Interest subsidies. All graduates (loan = $60,000)

Income category	Surcharge (25 per cent)	Hybrid
Low	$13,000	$11,600
Medium	$4,800	$6,200
High	-$300	$2,600
Average subsidy for all graduates[10]	**$2,200**	**$3,700**

The interest rate subsidies presented above can be more usefully expressed as percentages of the loan and this is now done in Table 3.

Table 3
Interest subsidies expressed as a percentage of the loan. All graduates (loan = $60,000)
(per cent)

Income category	Surcharge (25 per cent)	Hybrid
Low	22	19
Medium	8	10
High	-1	4
Average subsidy for all graduates	**4**	**6**

The results from Table 3 illustrate the costs involved in the replacement of the use of the bond rate to index HELP debts with a 25 per cent surcharge and a hybrid interest rate regime involving both the CPI and the bond rate. It is clear that both the surcharge and the hybrid add significantly to the loan subsidies for low income graduates, which of course is the intention. It is also apparently the case that the removal of much of the inequity associated

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[10] The subsidy estimates for 'all graduates' in Tables 2 and 3 include graduates with incomes below the minimum income threshold. That is, the average subsidy is estimated with reference to *all* graduates, and not just those who repay their loan. The aggregate cost of the interest subsidy could be found by multiplying the average subsidy values by the number of borrowers.

with the bond rate can be achieved with what might be described as fairly low costs to the budget in aggregate, which are around 4-6 per cent of the loans made. This assessment is of course is a decision for government.

3 (iv)   The Impact of Interruptions to Employment

It is possible with our methods to illustrate the effects on real loan repayments of a graduate spending time out of the labour force (or, at least spending time earning less than the first income threshold of repayment of HELP). This should be of considerable interest for policy in this area given that the original design parameters of HECS were motivated in part to not disadvantage debtors choosing to take time away from employment for the purposes of child-rearing. We are able to illustrate the costs of this decision through consideration of the effects on loan repayments of a $60,000 loan for a person spending 10 years out of the labour force from age 25, and for graduates of different income levels and comparing the results with graduates who do not leave employment (as shown in Figure 2).

Comparison of the data from Figures 2 and 3 illustrates that when HELP is indexed to the bond rate spending 10 years out of the labour force adds about $8,000-15,000 to the real lifetime debt repayments, and the percentage increase is around 7-20. There are close to zero consequences for real debt repayments under either the surcharge or the hybrid interest rate regimes.

Figure 3
Borrower repayments (2016 dollars). All graduates, with 10 years interrupted employment from age 25 (loan size = $60,000).
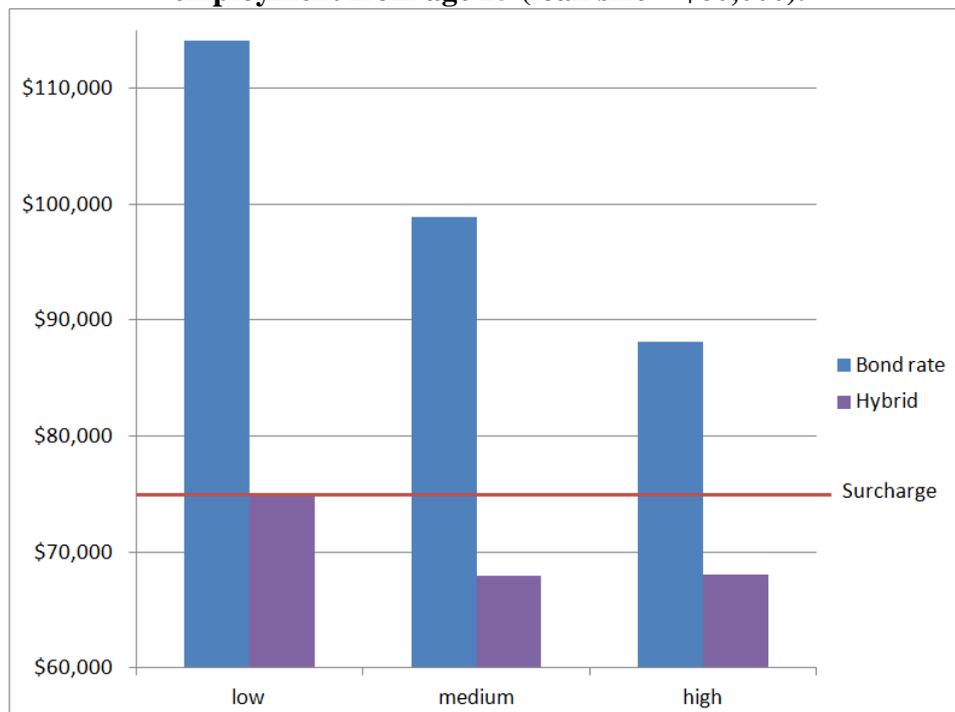
3 (v)   Summary of results

The results presented above and in the Appendices suggest that the use of the bond rate is inequitable in that it would result in higher lifetime real debt repayments for lower income graduates. It is also the case that the differences between low and high graduate income

groups are not trivial and can be as high as $25-30,000 for a debt of $60,000. Importantly, the two suggested alternative interest rate regimes are associated with very significant diminution of the inequities and actually to zero for the surcharge.[11]

We have also illustrated the costs to the budget of the replacement of the bond rate with either of the two alternatives. It becomes clear from analysis of the results for both $30,000 and $90,000, now presented in Table 4, that the overall increases in the subsidies with the adoption of the alternatives are relatively small for all loan sizes that might come about in 2016 (for example, non-recoverable debt of approximately 20 per cent is associated with the current HECS-HELP system).

Table 4
Interest subsidies expressed as a percentage of the loan. All graduates, different loan levels

Loan amount (2016 dollars)	Surcharge (25 per cent) (per cent)	Hybrid (per cent)
$30,000	0	7
$60,000	4	6
$90,000	6	5

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Higgins, T., Sinning, M. (2013) "Modeling Income Dynamics for Public Policy Design: An Application to Income Contingent Student Loans" *Economics of Education Review*, December 2013, 37, 273-285.

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[11] The analysis presented above infers that individual income distributions adequately reflect the actual inequality experience of HELP debtors. However, this is a contentious presumption because the majority of adults live in households with other people and to some extent share in the common income available to that household. It might follow then that HELP debtors with relatively low individual incomes are not disadvantaged with respect to the distribution of household incomes, which would imply that the conclusions drawn with respect to the distributional inequities of the use of the bond rate are not robust in a broader context. Chapman and Umbu (2014) have commenced investigation into this matter and their preliminary findings support the inference that low income earners who attended university also tend to have lower household incomes, however, further work remains to be done in this area.

Appendix 1

Table A1
Loan Repayment Parameters by Income

Repayment rate	HELP Income Threshold 2014-15 actual	HELP Income Threshold 2016-17 projected
2.0%		50638
4.0%	53345	56264
4.5%	59422	62674
5.0%	65498	69082
5.5%	68940	72712
6.0%	74106	78161
6.5%	80258	84650
7.0%	84482	89105
7.5%	92971	98058
8.0%	99070	104491

Appendix 2

Figure A1
Borrower repayments (2016 dollars): all graduates (loan = $30,000)
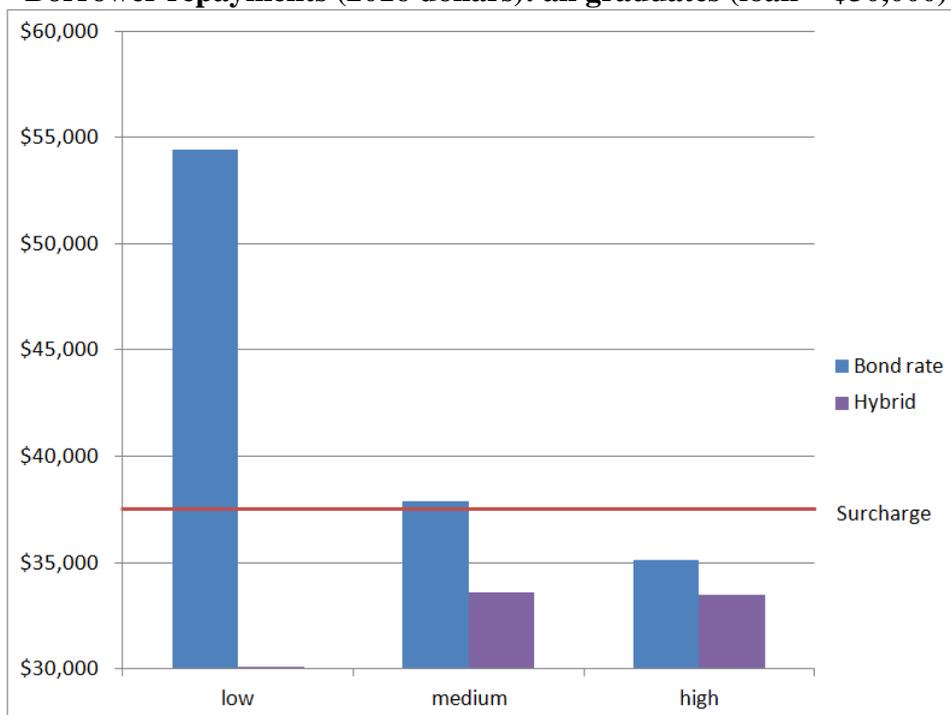
Table A2
Interest subsidies. All graduates (loan = $30,000)

Income category	Surcharge (25 per cent	Hybrid
Low	$7,500	$11,100
Medium	$300	$3,100
High	-$1,900	$1,300
All graduates	**-$100**	**$2,200**

Table A3
Interest subsidies expressed as a percentage of the loan. All graduates (loan = $30,000)
(per cent)

| Income category	Surcharge (25 per cent)	Hybrid
Low	25	37
Medium	1	10
High	-6	4
All graduates	**0**	**7**

Figure A7 in Appendix 3 shows the costs to the borrower and to the Government under the various indexation options for all incomes for a loan size of $30,000

Figure A2
Borrower repayments (2016 dollars): all graduates (loan = $90,000)
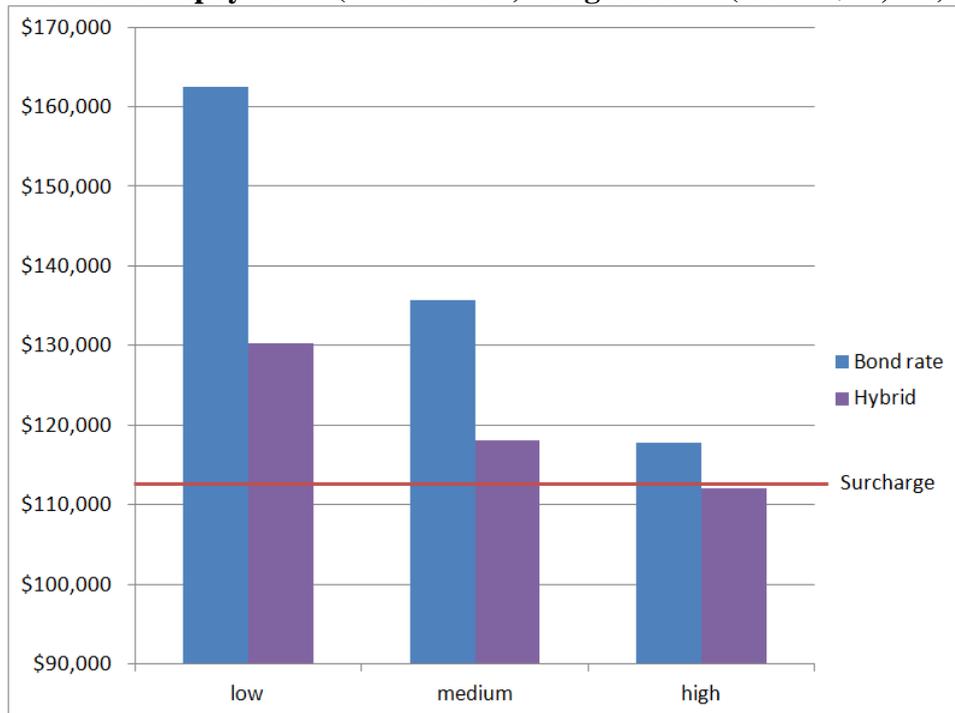
Table A4
Interest subsidies. All graduates (loan = $90,000)

Income category	Surcharge (25 per cent	Hybrid
Low	$20,500	$12,700
Medium	$12,300	$9,200
High	$3,500	$3,800
All graduates	**$5,300**	**$4,300**

Table A5
Interest subsidies expressed as a percentage of the loan. All graduates (loan = $90,000)
(per cent)

Income category	Surcharge (25 per cent)	Hybrid
Low	23	14
Medium	14	10
High	4	4
All graduates	**6**	**5**

Figure A9 in Appendix 3 shows the costs to the borrower and to the Government under the various indexation options for all incomes for a loan size of $90,000.

Appendix 3

The following appendix provides further details of the impact of the different indexation arrangements on time to repayment and costs to both borrower and Government. Two types of plots are used to present results. The first type shows the accumulated repayments (in 2016 dollars) and the number of years until repayment for graduates with three income levels: low, medium and high.[12] Figure A3 is such a plot, where the graduate cohort is all graduates with full-time or part-time employment who took out a HECS-HELP loan of $30,000.

Figure A3
All graduates, loan of $30,000 in 2016 dollars, CPI indexation, existing thresholds.
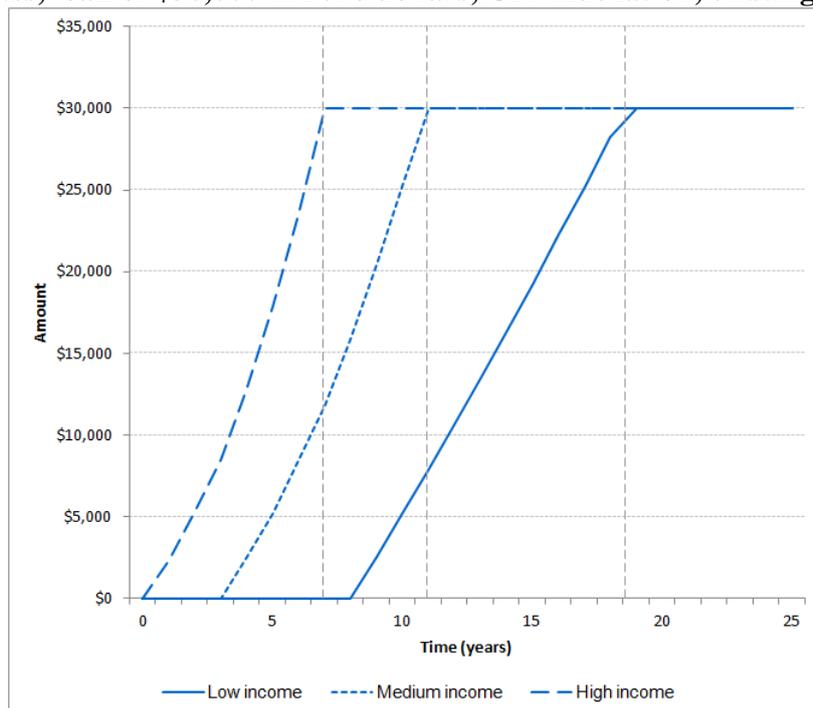
In Figure A3 since loan indexation is at CPI, the cost to the borrower in 2016 dollars is $30,000, which is the same for *all* incomes provided that the incomes are high enough to repay the loan in full.

This can be displayed more efficiently in Figure A4, which shows the cost of repayments for the borrower for *all income percentiles* ranging from the 1st percentile to the 90th percentile. In this plot the horizontal axis is the income percentile, and the vertical axis is the amount in 2016 dollars. The red line gives the borrower's cost of repayment in 2016 dollars for each income percentile. In this example the majority of individuals repay the loan of $30,000. The zero repayment for graduates below the 24th income percentile implies that these individuals earn insufficient income to make compulsory repayments. Those with incomes at the 24th and 25th percentile partially, but not completely, repay their debt.

The blue line gives the cost to Government, which is equal to the difference between the present value of the loan and the present value of repayments, discounted at the bond rate (assumed as the Government's cost of borrowing). Although graduates earning above the 25th income percentile repay their total debt, the cost to the Government is non-zero because the

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[12] Low, medium and high income corresponds with the 30th, 50th and 75th income percentiles for Figure A3

debt is indexed at a rate below the cost of borrowing. This interest rate subsidy is higher for lower income earners because they take longer to repay than higher income earners.

Figure A4
Borrower repayments and costs to Government. All graduates, loan of $30,000 in 2016 dollars, CPI indexation, existing thresholds.
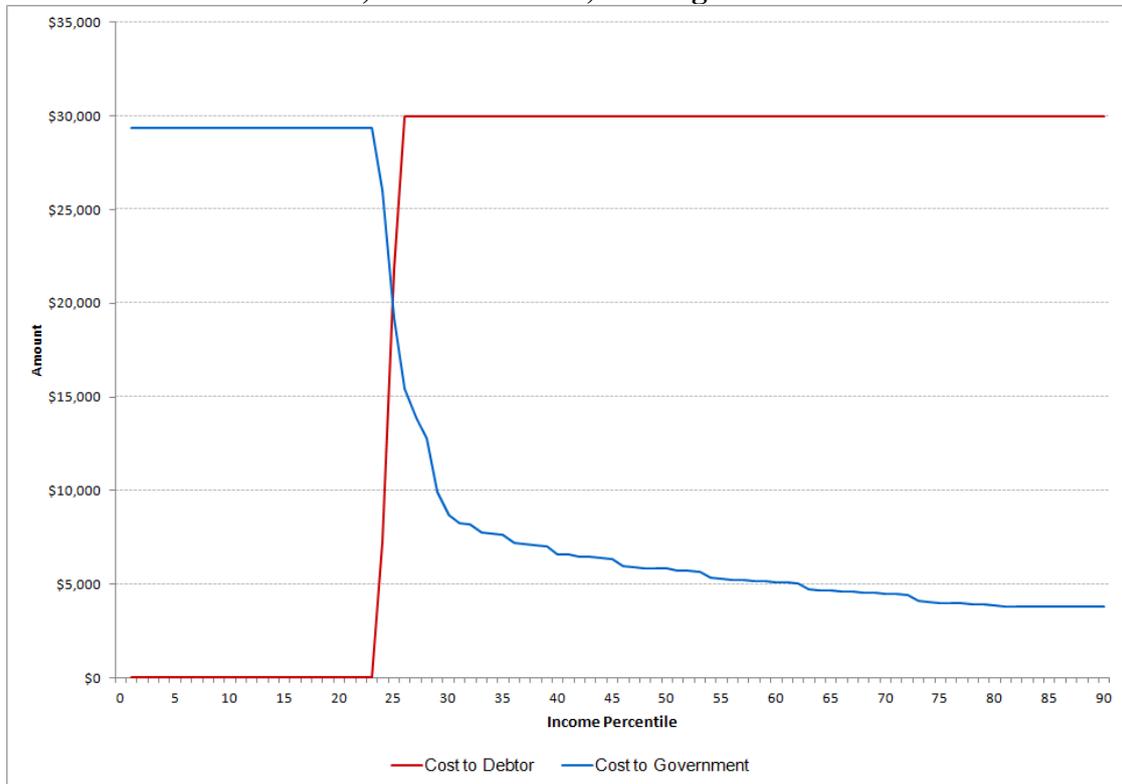

Like Figure A3, Figure A5 gives the repayment amounts and time to repayment for a selection of graduates, but where loan indexation is now the bond rate (assumed to be 5 per cent) and where repayment thresholds include the proposed 2 per cent income threshold as shown in Table A1 in Appendix 1.

In contrast to Figure A3, the total repayment amounts differ for the different income percentiles as a consequence of bond indexation. This has the effect of increasing the total repayment for all incomes above the minimum threshold, with lower incomes taking a longer time to repay, and therefore experiencing greater accumulated interest and higher total repayments. In this example, those with a low income take 22 years to repay, compared with 12 years for a medium earner and 8 years for someone with a high income. The total amounts repaid are $43000, $38000 and $35000 in 2016 dollars, as compared to $30000 for borrowers who face CPI indexation only.

Figure A6 displays the borrower and government costs for all income percentiles for CPI indexation with current income thresholds, and for bond rate indexation that includes the 2 per cent income threshold. For bond rate indexation, Government costs beyond the 24th income percentile are nil because there is no interest subsidy if indexation is at the cost of borrowing.

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Figure A5
**All graduates. Loan of $30,000 in 2016 dollars, Bond rate indexation (5% pa)**
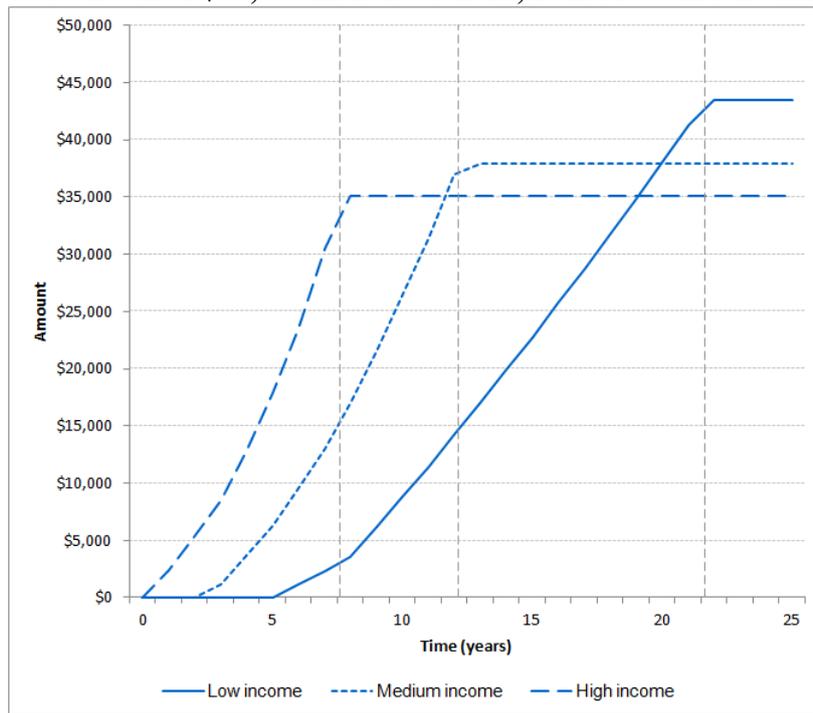
Figure A6
Borrower repayments and costs to Government. All graduates. Loan of $30,000 in 2016 dollars.
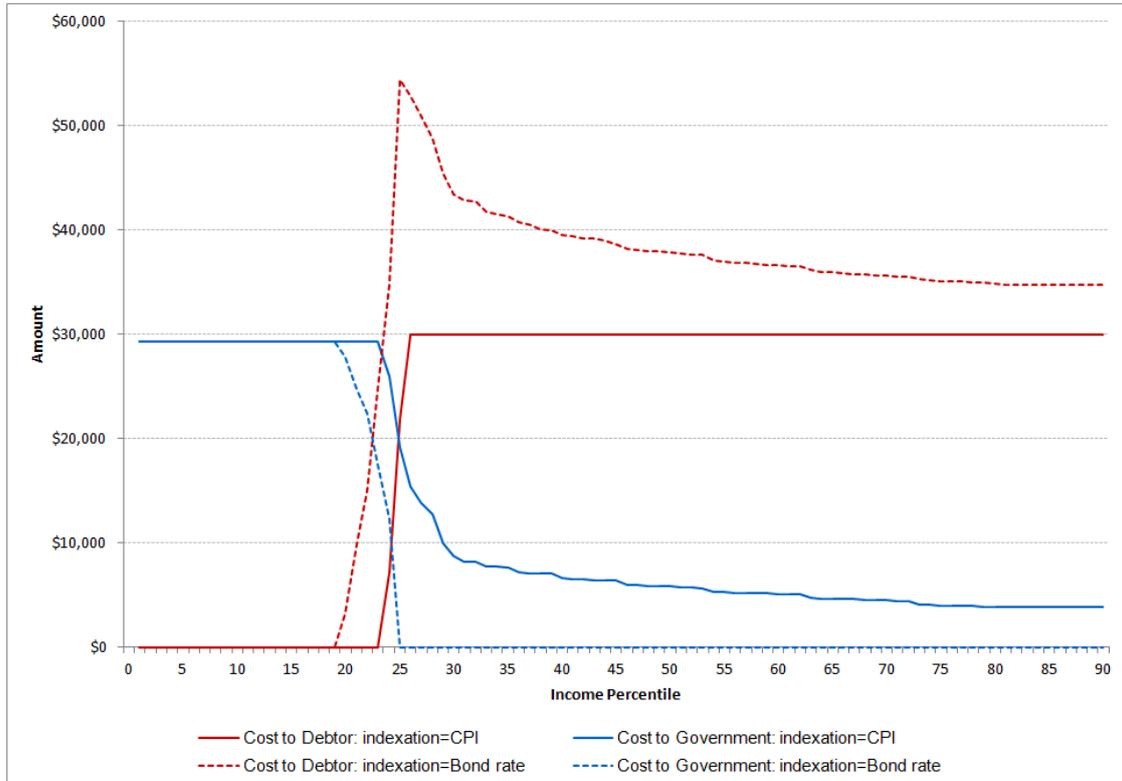

The remaining figures in this appendix give the costs to the borrower and Government for all graduates under different loan sizes and interest rate regimes as summarised in Sections 3 and in Appendix 2.

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Figure A7
Borrower repayments and costs to Government. All graduates. Loan = $30,000.
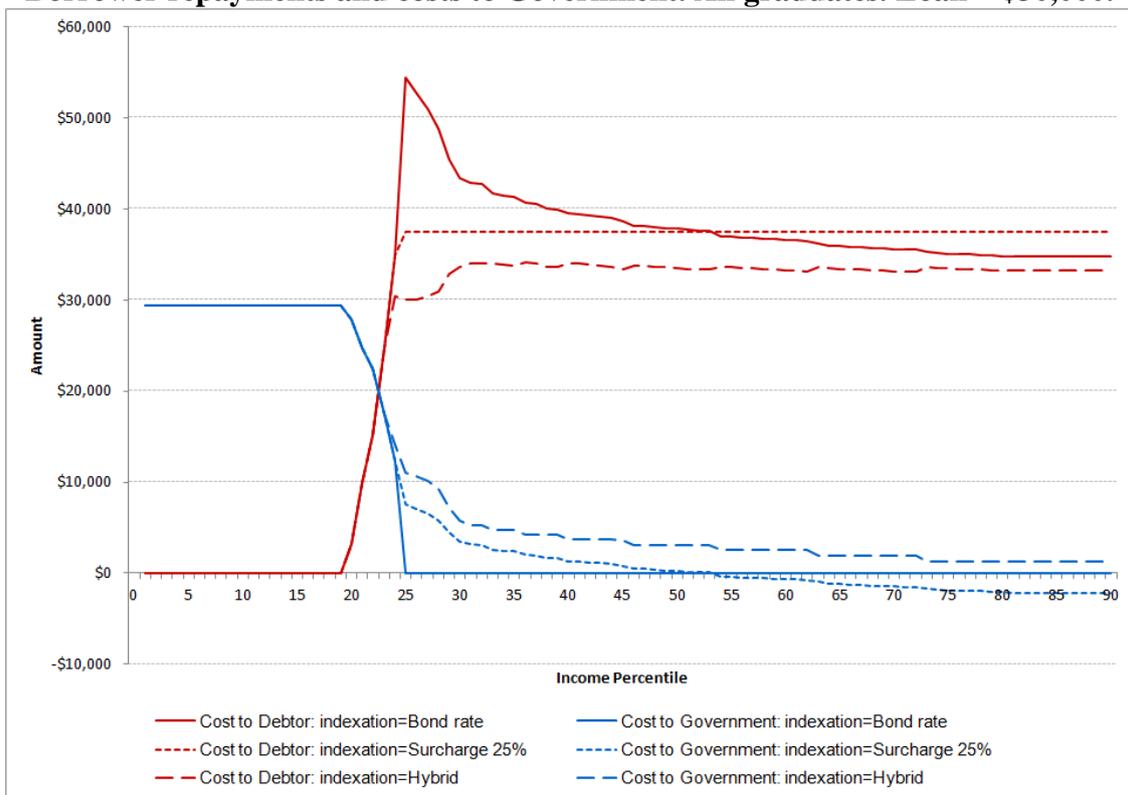
Figure A8
Borrower repayments and costs to Government. All graduates. Loan = $60,000.
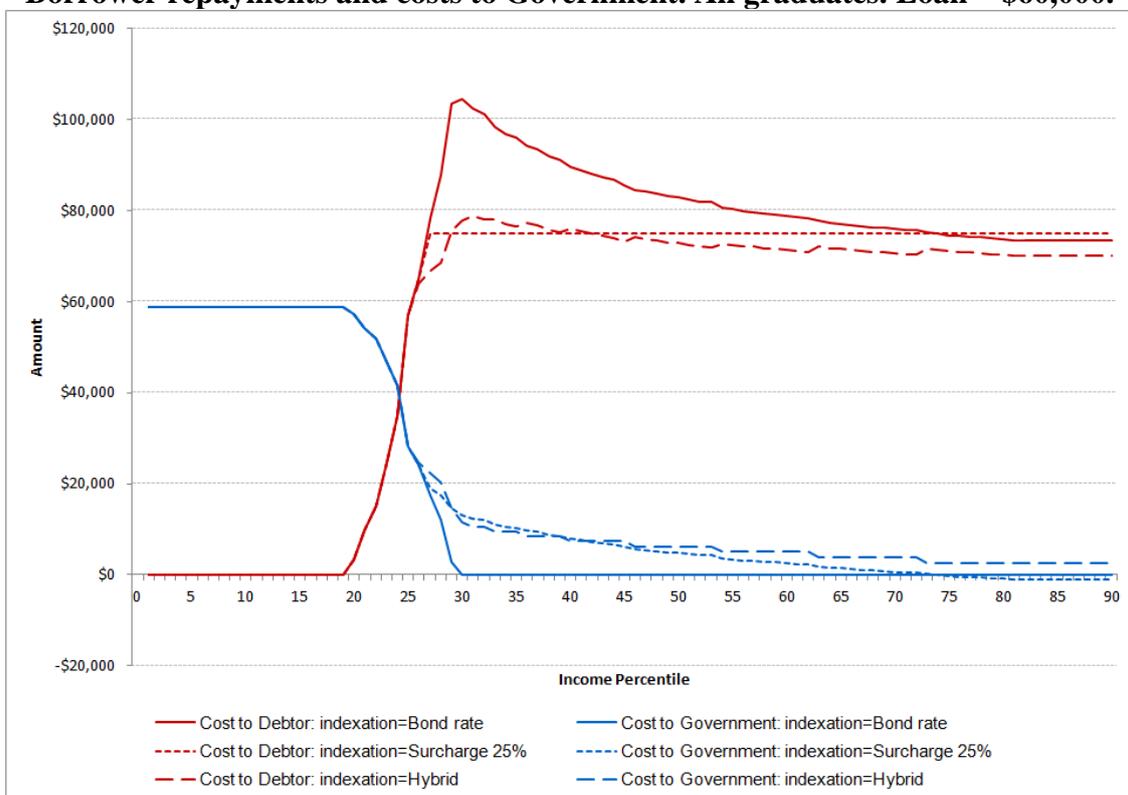
Figure A9
Borrower repayments and costs to Government. All graduates. Loan = $90,000.