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Impact of the Australian Higher
Education Funding Reforms

Chris Ryan

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Abstract

This brief explores the potential impact on the time students take to repay their tuition loans of changes proposed by the Australian Government in its May 2014 budget to the funding and operations of the Australian higher education sector. The key results of the analysis are:

Result 1: Total loan repayments vary substantially across the graduate income distribution, increasing by more than double the higher tuition charges for about 20% of graduates, since these graduates take a long time to repay the debt.

Result 2: The additional time taken to repay tuition loans also varies substantially across the graduate income distribution, increasing most at incomes a little above the first repayment threshold. Across the graduate income distribution, repayment periods are typically about double under the new arrangements studied compared with existing arrangements, if repayments are made at all.

Result 3: Loan default will increase. An increased proportion of individuals will never repay their tuition loans. The proportion who never repays anything will not change much, but the proportion making only partial payments will increase, especially among female graduates.

Result 4: Even in the absence of any increase in fees from university fee deregulation, the package of other measures results in an increase in the time to repay loans of over ten years for some groups of graduates. Increases in fees of the magnitudes envisaged here as part of the fee deregulation element of the package increase the additional time to repayment beyond fifteen years for some individuals.

Result 5: Variations to the base case or analysis of specific groups do not result in qualitatively different results – typically, the average years required to repay the loan approximately doubles under variations to the new arrangements.

JEL classification: I21, I28, H52

Keywords: University funding, student loan financing, access and equity

1. Introduction and background

In its May 2014 budget, the Australian Government announced a number of proposed changes to the funding and operations of the Australian higher education sector. The changes were announced to take effect from 2016. They include changes to the repayment regime for the student tuition charge income contingent loan (the HECS-HELP scheme) that involve a lowering of the first repayment threshold [Element A] and the introduction of a real rate of interest on outstanding debt [Element B]. These changes will affect both future and current students as they repay their loans. A third change affecting only new students involves the reduction of the Commonwealth's contribution to universities, replaced by higher private student contributions [Element C]. The last proposed change from the Government will be to allow universities to set their own student tuition fees, subject to them not exceeding the amounts charged to international students [Element D].

The Government expressed the belief that a further change allowing private and/or non-degree providers to receive public support will place some restraint on existing universities from increasing their fees too much. Nevertheless, concerns have been raised about the implications for students from these changes, particularly as they affect course fee increases, debt repayment burdens and the increase in the time taken to repay loans, as well as their differential impact on men and women. This brief looks at some of the consequences of these decisions, focussing on the time taken to repay student loans across the graduate income distribution, seeking to identify where in the income distribution the effects of these various changes will be greatest.

Analyses of the likely impacts of the proposed changes for students have already been published. For example, Sharrock (2014) presents evidence on the increases in debts students are likely to face. Universities Australia (2014) analysed what the impact of the new arrangements would be on the time taken by students to repay their debts: by 6-7 years for engineering students, and by 2 to 6 years for nursing graduates, depending on the fee scenario. NATSEM (2014) modelling also suggested the additional payments and time taken to repay debts for graduates with standard debts and 'representative' income profiles varied substantially across fields of study. Chapman and Higgins (2014) show that the loan repayment burden associated with the introduction of a real rate of interest is greater for those employed people on lower incomes than those on higher incomes. They propose alternative arrangements that they view as less regressive.

This policy brief addresses similar questions, but adopts a different approach to these recent studies. It uses estimated empirical income profiles over graduates' careers to assess how changes in student charges and debt levels will influence the time graduates take to repay their loans at different points in the income distribution. As well as estimating impacts for those with median incomes, it shows the impact of the changes for those with very high or very low lifetime incomes. This allows identification of where in the graduate income distribution the changes will have the greatest impact, how the changes will affect the proportion who will never repay their loans and how females might be affected differently from males. It makes no assumptions about whether individuals are employed or not, nor does it focus on a few scenarios for 'representative' individuals.

Instead, this paper uses estimated empirical income profiles from real data, taken from the first twelve waves of the Housing, Income and Labour Dynamics in Australia (HILDA) survey. Technical aspects of the analysis are summarized in the Appendix. The paper makes no attempt to model any behavioural responses to higher fees, or increased competition within the sector that the fees might

induce. It reports how the reforms will change the debt repayments of graduates at the 5th percentile of their income distribution for each year up to 35 years after graduation, compared to those at the 15th or any other percentile of the income distribution. Like Chapman and Higgins (2014), graduates are assumed to remain at the same point of the income distribution throughout their careers.

The results for one fee regime are presented in detail. This regime involves graduates completing a three year degree, with annual tuition charges of \$10,000 per annum (approximately the annual payment for current Band 3 fields). The time to repay the debt for individuals across the income distribution under current repayment parameters is contrasted with the time taken under the proposed new arrangements, with repayments commencing at a lower first threshold [Element A], with the debt subject to a 3% real rate of interest [Element B], with increased student contributions of \$3,000 per annum to make up for the reduced Commonwealth funding [Element C] and with increased course charges of a further 50% of the adjusted charges [Element D], such that fees rise to \$19,500 per annum in total.¹ Annual tuition fees of such a magnitude in general or for some disciplines have also been studied by Chapman and Higgins (2014), NATSEM (2014) and Universities Australia (2014).

The analysis distinguishes the effects on the time taken to repay debts for males and females. Summary information on variations to this base case is also provided, though in much less detail since the distributional consequences of alternative regimes are similar to those presented for the base case.

2. Loan repayments

Result 1: Total loan repayments vary substantially across the graduate income distribution, increasing by more than double the higher tuition charges for about 20% of graduates, since these graduates take a long time to repay the debt.

The total incremental loan repayments associated with the changed parameters in the base case are shown in Figure A. It shows the additional nominal repayments individuals across the graduate income distribution would pay in the base case with the implementation of the Government's proposed changes, as well as their present value discounted at 3% per annum.² Both the additional nominal payments and their discounted present values are shown for males and females.

The nominal payments increase much more for individuals whose incomes are just above the first income repayment threshold. For males this occurs around the 10th income percentile,³ for females around the 30th income percentile. At these parts of their respective distributions, individuals take a relatively long time to pay off their debt, and therefore pay the most with interest charged on outstanding debt. Males from the 15th to the 35th percentiles and females from the 40th to the 60th

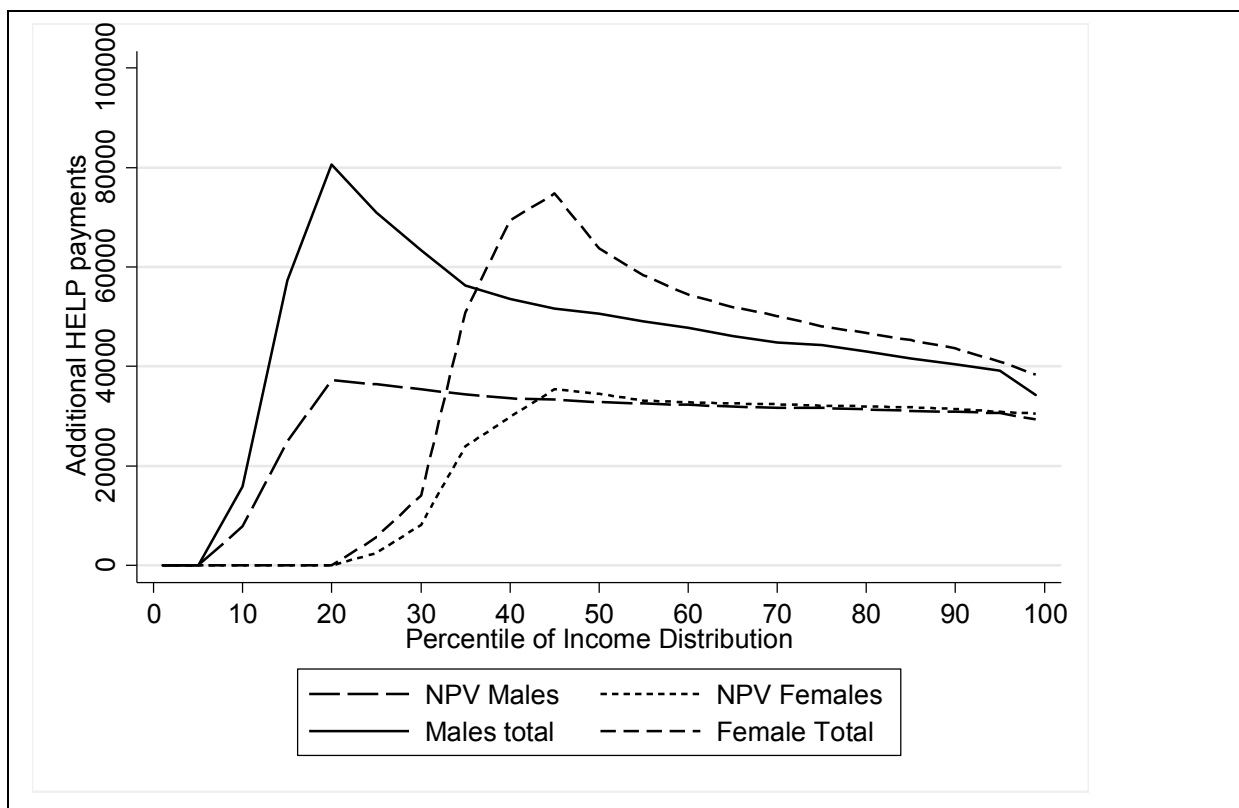
¹ All figures in the text are in \$2012. The focus of the analysis is on the time taken to repay loans, which is invariant to the years in which the \$ are denominated. \$2014 amounts would be about 5.5% higher than those reported, \$2016 amounts 11% higher.

² A discount rate higher than the assumed real rate of interest on outstanding debt would result in steeper negatively sloped lines over the income distribution, while a lower rate would result in slightly positively sloped lines.

³ Estimates are made only at 5-point intervals across the distribution from the 5th to the 95th percentile, as well as at the 1st and 99th percentiles. Hence, estimates between the 5 unit percentiles are interpolated.

make additional payments that are more than double the additional tuition charges. Loan repayments do not increase for those on the lowest incomes, since they never repay any debt, and increase by less at the top of the distribution where individuals pay the debt off quickly. Males at the 20th percentile of the graduate income distribution pay an additional \$80,000 in total in repaying the loan, and females at the 45th percentile around \$75,000 (the difference in the total payments reflects differences in the timing of repayments). In contrast, males and females at the 90th percentile will pay less than \$45,000 more.⁴ The discounted, present value of the additional repayments approaches \$28,500 (3 times \$9,500) as income increases: it exceeds that amount in the lower income percentiles where individuals begin to repay the loan because individuals there lose a larger interest rate subsidy with the move to charging a real interest rate on outstanding debt.

Figure A: Additional HECS-HELP repayments across the graduate income distribution for males and females: total payments over 35 years and their Net Present Value (3% discount rate)



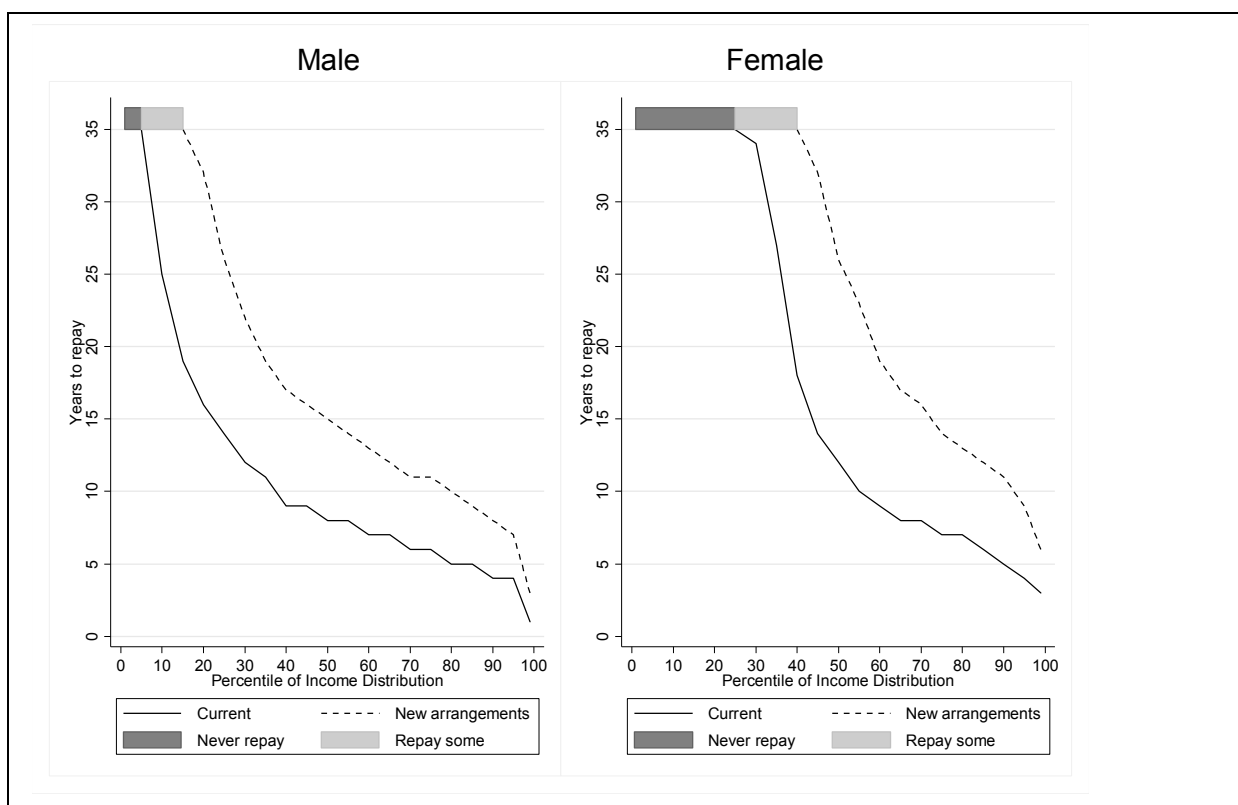
3. Time after graduation when tuition loans will be repaid

Result 2: The additional time taken to repay tuition loans also varies substantially across the graduate income distribution, increasing most at incomes a little above the first repayment threshold. Across the graduate income distribution, repayment periods are typically about double under the proposed arrangements studied here compared with existing arrangements, if repayments are made at all.

⁴ A similar graph to Figure A depicting current arrangements would show the total payments lines as flat across the income distribution among those who repay the debt and the present value lines as positively-sloped lines, increasing with income.

Figure B contains estimates of how long it takes to repay the tuition debt across the entire income distribution under the existing scheme's parameters, and under the proposed changes to the scheme for males (left panel) and females (right panel). The Figure contains information about three possible payment outcomes: individuals may never repay any of the loan by 35 years after graduation, they may repay some but not all of the loan by 35 years after graduation or they may pay all of the loan by the year represented by the lines under the two scenarios. Full or partial default on the loan is shown above the 35 year line to the points where the repayment lines commence. As it turns out, the gap to the solid lines under the current arrangements reflects the incidence of people who never repay any of the loan (shown with dark shading). They never repay any of the loan under the new arrangements either, and the gap between the solid and the dashed lines along the 35 year line represents those people who repay part of the loan but have not completely repaid it after 35 years (shown in lighter shading).

Figure B: Estimated years taken to repay HECS-HELP debt across the graduate income distribution under existing and proposed new arrangements: males and females



Under current arrangements, the bottom 5% of males never repays any of their debt, while that figure is 25% for females. For those at median incomes, males take about 8 years to repay their debt, females 12 years. At the top of the distributions, it is less than four years. Under the proposed new arrangements, repayment periods will about double.⁵ Those at median incomes take much longer to repay their debts than under existing arrangements, with males likely to take 15 years to repay their debt, females 26 years. Males in ranges from the 15th to the 50th percentiles will take 15 years or

⁵ In the base case, the amount of the loan approximately doubles. The approximate doubling of the repayment period reflects the offsetting effects of income growth with experience (which reduces the repayment period) cancelling out the impact of a 3% real interest rate (which increases it).

more to repay their debts, while for females this length of repayment is evident out to the 70th percentile.

Result 3: Loan default will increase. An increased proportion of individuals will never repay their tuition loans. The proportion who never repays anything will not change much, but the proportion making partial payments only will increase.

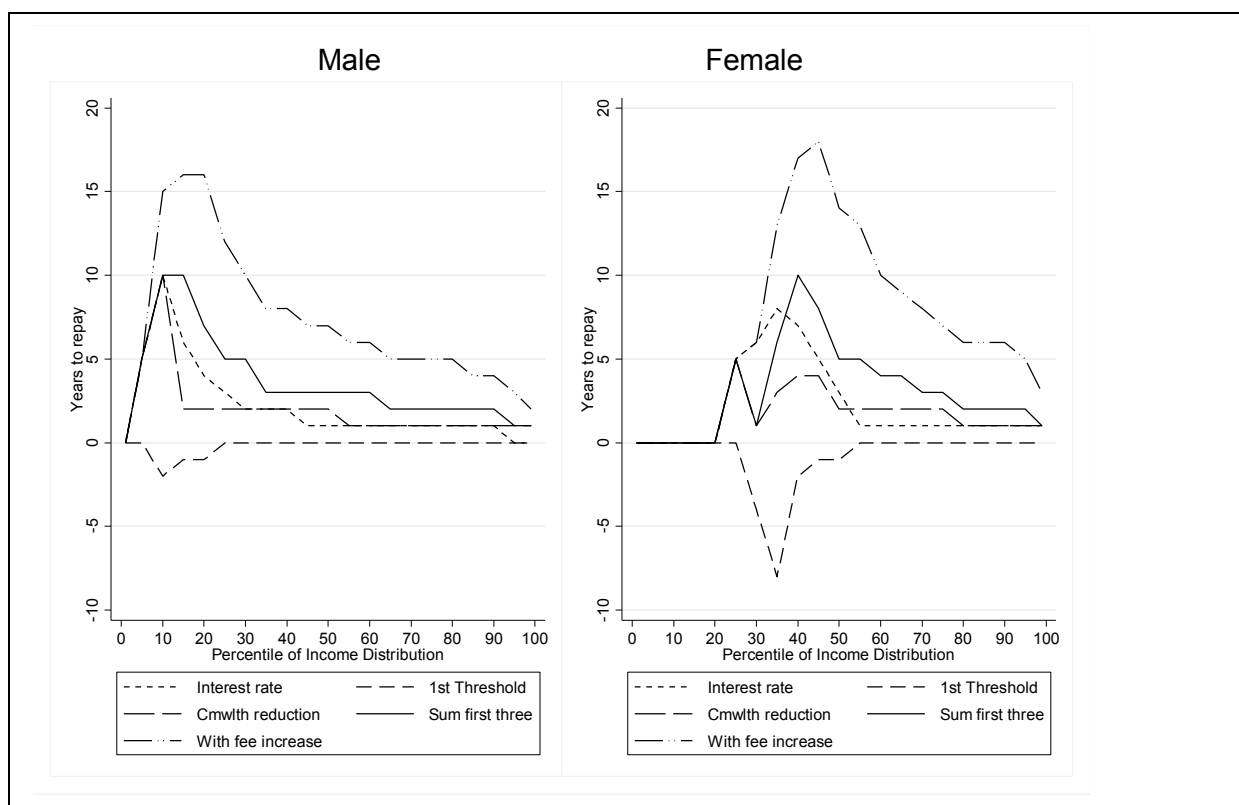
From Figure B fewer people will repay their debts in full and all groups take longer to repay their debts under the new arrangements. Many individuals repay large amounts of debt, but do not completely repay their debts (reading Figures A and B together). For example, females from the 25th to the 40th income percentiles make only partial repayments.

4. Which elements of the package increase the time taken to repay the loans?

Result 4: Even in the absence of any increase in fees from university fee deregulation, the package of other measures results in an increase in the time to repay loans of over ten years for some groups of graduates. Increases in fees of the magnitudes envisaged here as part of the fee deregulation element of the package increase the additional time to repayment beyond fifteen years for some individuals.

Figure C shows how the different elements of the Governments reform program add to the years repaying the HECS-HELP debt across the graduate income distribution for males (left panel) and females (right panel).

Figure C: Contributions from policy elements to the additional years taken to repay HECS-HELP debt under new arrangements – across the graduate income distribution for males and females



Once more, the changes vary substantially across the graduate income distribution: there is no change at the bottom of the distribution and little change at the top, but very substantial changes for those in the lower half of the income distribution.⁶ Males in the 10-20th and females in the 35-45th percentiles face the biggest increases in the time over their careers that they will be repaying their debts. The introduction of the interest rate on outstanding debt adds a sharp peak to male years to repay around the 10th percentile, but its effect diminishes by the 30th percentile. For females, the interest rate introduction effect influences the years to repay further up the income distribution.

5. Results with variations to the base case changes

Result 5: Variations to the base case or analysis of specific groups do not result in qualitatively different results – typically, the average years required to repay the loan approximately doubles under variations to the new arrangements.

Variations to the base case considered here, or the set of individuals to which it applies are informative about the broader impacts of the proposed policy changes. Table 1 contains estimates of the time required to repay the tuition debts under a number of alternative scenarios. Estimates are presented for ten different cases. For all cases, results are reported for that case under the existing loan repayment parameters (in the first row for each case) and the estimated time to repay the loan under the new arrangements (in the second row for each case), involving the introduction of a 3% real interest rate, a first repayment threshold 10% lower than the current rate, a 30% increase in tuition charges to cover the reduction in Commonwealth payments, and a further 50% increase in fees associated with the deregulation of the higher education system. The time to repay the loan is estimated separately for males and females and presented for individuals with incomes at the 25th, 50th and 75th percentile of the male and female graduate income distributions.

The first case is the 'base case' already discussed, involving tuition charges of \$10,000 per annum over three years, increased by the proposed reforms to \$19,500 per annum. The remaining cases in Table 1 reflect variations from the base case: a four year course (case B); lower initial fees of \$6000 per annum (case C); the income profiles of those from low-socio-economic status backgrounds (case D);⁷ the income profiles of those who in studied low-income fields (case E), middle-income fields (case F) and high-income fields (case G);⁸ the income profiles of those always employed full-time (case H); the income profiles that remove any impact from cognitive skills (case I); and income profiles of those who completed their qualifications from a Group of Eight university (case J).⁹

⁶ The apparent large decline in the time take to repay the loan for females at the 35th percentile arises because incomes fall for this group over some of the range beyond completing the degree, pushing them below the current first repayment threshold for a period so repayment is interrupted, but not below that of the revised arrangements, so individuals repay the debt continuously. The pattern for the reduction in Commonwealth funding around the same part of the distribution also reflects similar patterns of income growth.

⁷ Based on those in the lowest quintile of the parental occupational socio-economic status scale, reflecting parents' occupations when the individual was aged fourteen.

⁸ Low, Middle and High income fields are defined in the technical appendix, along with the way the impact of cognitive skills were removed from the analysis.

⁹ The Group of Eight Universities include: the Australian National University, Monash University and the Universities of Adelaide, Melbourne, New South Wales, Queensland, Sydney and Western Australia.

In all cases, the time taken to repay debts will increase substantially. As before, the average years required to repay the loan approximately doubles under the new arrangements, regardless of the starting circumstances. The one exception to this statement is case C, the case with lower initial tuition charges, where the repayment period increases by about 60% rather than doubling. Where either lower fees or smaller increases associated with fee deregulation were analysed, the increases in time to repay were smaller than double, but in all cases were substantially higher than current repayment periods, like case C.

Table 1: Years to repay loans in alternative cases

	Males			Females		
	Income percentiles			Income Percentile		
	25 th	50 th	75 th	25 th	50 th	75 th
A. Base case with Fees: \$10000 per annum, 3 year course, 30% cost recovery, 50% fee increase	14	8	6	*	12	7
	26	15	11	*	26	14
Difference from base case:						
B. 4 year course	16	10	7	*	14	9
	*	19	14	*	*	17
C. Fees: \$6000 per annum, with 30% cost recovery & 50% fee increase on lower fee	11	6	4	*	8	5
	18	10	7	*	16	8
D. Low SES income profile	14	9	7	*	17	8
	26	15	11	*	26	14
E. Low income field of study profile	25	13	9	*	20	9
	*	26	18	*	*	18
F. Medium income field of study profile	16	10	7	*	13	8
	*	18	13	*	*	15
G. High income field of study profile	11	8	5	*	14	8
	27	14	10	*	28	13
H. Full-time worker income profile	11	7	5	15	9	7
	25	15	11	*	19	13
I. Removal of differential cognitive skills from income profile	16	9	6	*	14	8
	*	17	12	*	*	15
J. Group of Eight income profile (includes cognitive skill correction)	15	9	6	*	12	8
	26	16	11	*	31	11

6. Summary of other results

While not the focus of this brief, there are a number of other features of the results worth mentioning. First, the financial incentives for completion of a degree do not change much as a result of the changes proposed as part of the base case. The incentives in terms of rates of return and net present values of the stream of additional income from completion of a degree do not change at all at low income levels and by very little at high income levels. The rate of return falls by around just 1.5 percentage points for both males and females at median income levels. The decline in the net present value of completing a degree of just over \$30000 (see Figure A) is less than 10% of the original net present value for both males and females. Second, there are income premia associated with completing a degree from Group of Eight institutions compared to other universities, providing support for the expectation that fee increases are likely to be larger at those institutions with fee

deregulation. At median incomes, these premia are around \$175,000 for males and \$100,000 for females. The premium increases with income. Third, the post-graduation circumstances of people from lower socio-economic status backgrounds from university do not appear to be much different from those of other graduates. They experience very similar rates of return from completing a degree and loan repayment time periods to those of other graduates.

7. Discussion

The analysis presented here points to a substantial increase in the time graduates will take to repay student loans and an increase in the incidence of partial repayment of debts, especially among female graduates. That such a large proportion of women might not repay their loans could put the loan scheme in future jeopardy as governments/taxpayers meet the cost of unpaid HECS-HELP debt. Despite the increase in partial repayments, an increase in average payments per student of around \$9500 per male and \$7400 per female student in present value terms exceeds both the Commonwealth's reduction in funding in the base case of \$3000 and the increased university fees of \$6500 associated with fee deregulation. Hence, both of those parties will benefit financially from the changes, even with an increase in partial loan repayment. Reminding the Commonwealth of the financial savings made as part of this reform as the partial repayment issue emerges will be a major challenge for the university sector in the future.

Despite the minimal impact of the proposed changes on direct incentives to undertake university study, it is possible that the major increases in the time to repay debts may deter some would-be applicants, along with uncertainties induced by any future changes to the scheme should governments respond once the magnitude of the partial repayment phenomenon is revealed.

Technical appendix

The estimated income streams used in this paper are based on data from the first twelve waves of the Household, Income Labour and Dynamics in Australia (HILDA) survey (see Wooden and Watson 2002). It is a household-based longitudinal survey, which aims to track members of the household sample, and individuals who join those initial households, over an indefinite life. The initial sample of 7682 households was drawn in 2001 as a sample of households from 488 non-remote Census Collection Districts in Australia. The sample was intended to be nationally representative of the Australian population aged 15 years or more living in non-remote regions at that time. Some 13,969 respondents from those 7682 households were interviewed in the first wave of HILDA. A top-up sample of about 2000 households and 5500 individuals was added in 2011.

The “empirical income profiles” used in the analysis contained in this paper are based on actual data from the first twelve waves of HILDA, converted to \$2012. From these profiles, a second set were derived to match the patterns experienced by individuals as they age in the data, to which are added assumed productivity growth to trace out income profiles over people’s entire careers (at least up to 35 years after completing a degree).

Empirical income profiles are based on financial year personal income reported in the data (HILDA variable *_tifeffp*). The income data are deflated using the Australian Bureau of Statistics’ average weekly ordinary time earnings series to place incomes for all years in \$2012, the latest year of available data. Use of this series to deflate incomes removes any aggregate productivity effects from the income data over the HILDA collection period. Data pooled over all twelve waves are used in constructing the income profiles, so individuals contribute multiple observations of their income. This builds into the estimates something of the progression of incomes as individuals age. Inevitably, the estimates also contain some contribution from different cohorts. The purpose of using all of the data is to estimate the income levels associated with specified percentiles of the graduate income distribution at each integer year since people entered the labour market after completing their education. Estimates of the income quantiles at the 1st, 5th, 10th, 15th, . . . 85th, 90th, 95th and 99th percentiles of the income distribution are estimated for male or female graduates for each year of potential labour market experience from 1 through 35 years.

These empirical income profiles are estimated for groups of individuals with different completed educational qualification levels. Most of the focus is on those with university degrees. Moreover, different types of university graduates are considered: those who completed their degrees from an Australian Group of Eight university, compared to any other type of university; and those who completed their degrees in one of three groups of field of study: those typically leading to high, medium and low income profiles. The high group consists of graduates from Engineering, Information Technology, Law and Medicine. The medium group includes Architecture and building, Management and commerce, the Natural and physical sciences, Nursing, Other health-related fields and Society and culture, while the low group includes Agriculture, environment and related studies, the Creative arts, Education and Food, hospitality and personal services. This classification was constructed using average income estimates from HILDA. The 2012 wave of HILDA collected information on the institution attended and field of study of the highest post-school qualification completed by individuals. That information was linked to earlier waves in which the individual had already obtained an undergraduate degree as their highest qualification level. This 2012 HILDA data

also included cognitive function tests for subjects (see Wooden 2013). The word recognition and symbol-digit modalities measures were used to rank individuals within their single year of age for each measure in the 2012 data. Individuals were assumed to have the same average rank from the two tests in all other age categories in earlier waves of the data. The empirical income profiles by Group of Eight status and field of study group removed from the income levels the estimated impact of the cognitive skill rankings from income, to account for any differences in the average cognitive skills of people who attend different types of universities or do different types of qualifications might have.¹⁰ Empirical income profiles were also estimated for those individuals from the lowest socio-economic status quintile, based on the highest status occupation of their parents when they were aged 14 years. The occupation status score is provided in HILDA and is based on the AUSEI06 index (see McMillan *et al.* 2009). Regression estimates suggested that the return to completing a degree was not lower for individuals from the lowest SES quintile than for those in the top four quintiles.

Robustness

While the analysis in the briefing paper is based on the incomes of real people from HILDA, it does assume their mobility around the income distribution is non-existent. Another approach is to estimate the hypothetical loan repayments individuals could have made over the period they were observed in HILDA, given their incomes, and to sum those amounts to estimate the distribution of potential loan repayments.¹¹ Estimates from this approach are shown in Figures D and E.

In Figure D, the cumulative loan repayment distributions over 6, 8, 10 and 12 years are shown for males and females who had degrees, were in the data in all twelve waves and had a minimum age below 35 years during the twelve waves. Vertical lines are drawn at total loan repayments \$30000 and \$60000 in both panels. Looking first at the solid line for males, it indicates that around 60% of males could not have made repayments in excess of \$30000 over the first 6 years, while around 40% of males could have. The median male could have paid off \$30000 somewhere between 6 and 8 years in the data. After 12 years, around 45% of males could have made repayments of \$60000. At the 75th repayment percentile, payments of \$60000 could have been made after 8 years in the data. These are similar in some cases, and somewhat lower in others, than the years to repay estimates that appear in Table 1. Part of the difference presumably reflects that at least some of the people analysed here are not necessarily graduates in their first years after completing their degrees.

By contrast, potential repayments by females are much lower. Over 12 years, 70% of females would not have repaid \$30000, while those at the 75th repayment percentile would only have repaid \$30000 over about 10 years. These are slower repayment rates than those presented by Table 1 and suggest the estimated repayments from the income profiles might be too optimistic for females.

The second figure shows (in the left panel) that increasing the age range from including a minimum age of 35 to 45 does not change the picture much over all 12 waves for either males or females, and (in the right panel) that the changed arrangements, notably the lower first threshold, has little impact on the potential loan repayment profiles.

¹⁰ The cognitive skill effect was estimated from separate regression equations for males and females of real personal income on education/qualification levels (up to undergraduate degrees), a cubic function of experience, as well as interactions between qualifications and experience, full-time and part-time employment status, cognitive skill rank and either a field of study indicators or a Group of Eight indicator.

¹¹ In this case, the income data are deflated by the CPI, like the loan repayment parameters.

Figure D: Cumulative distributions of hypothetical HECS-HELP payments after 6, 8, 10 or 12 years in HILDA data –males and females

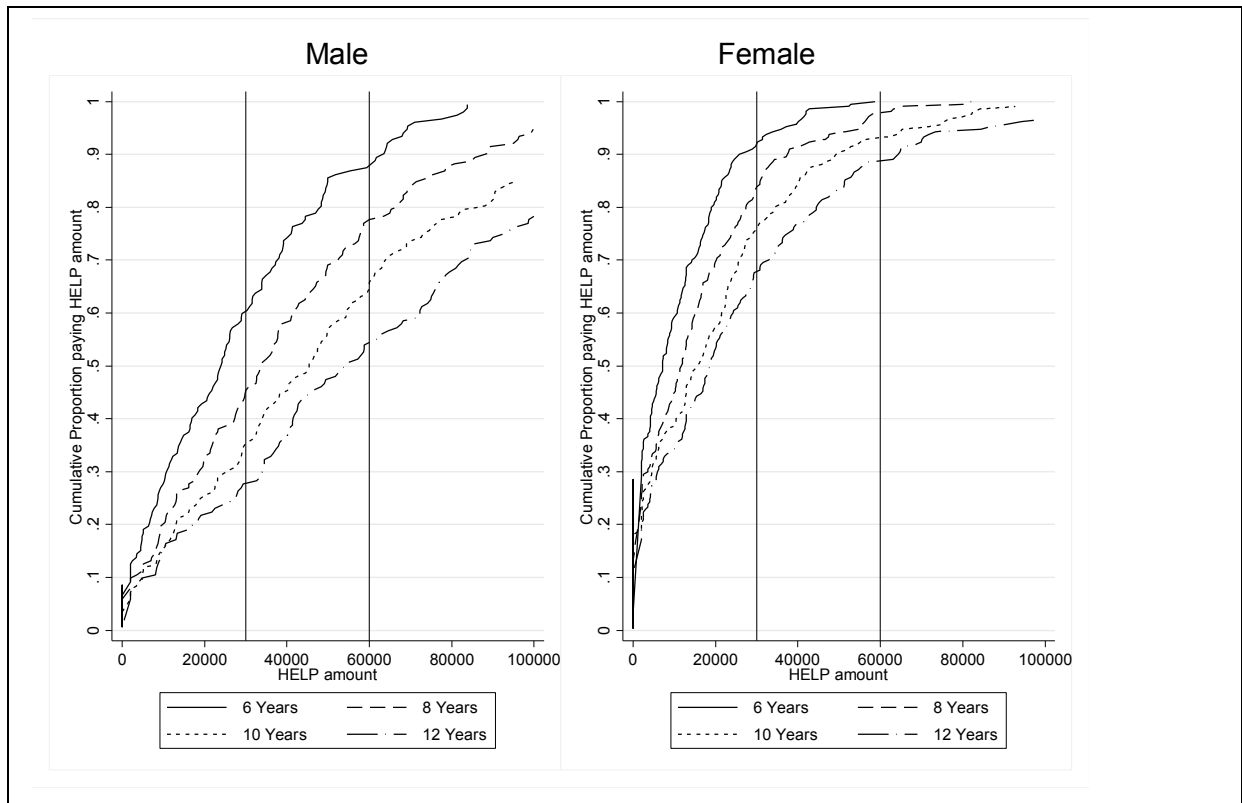
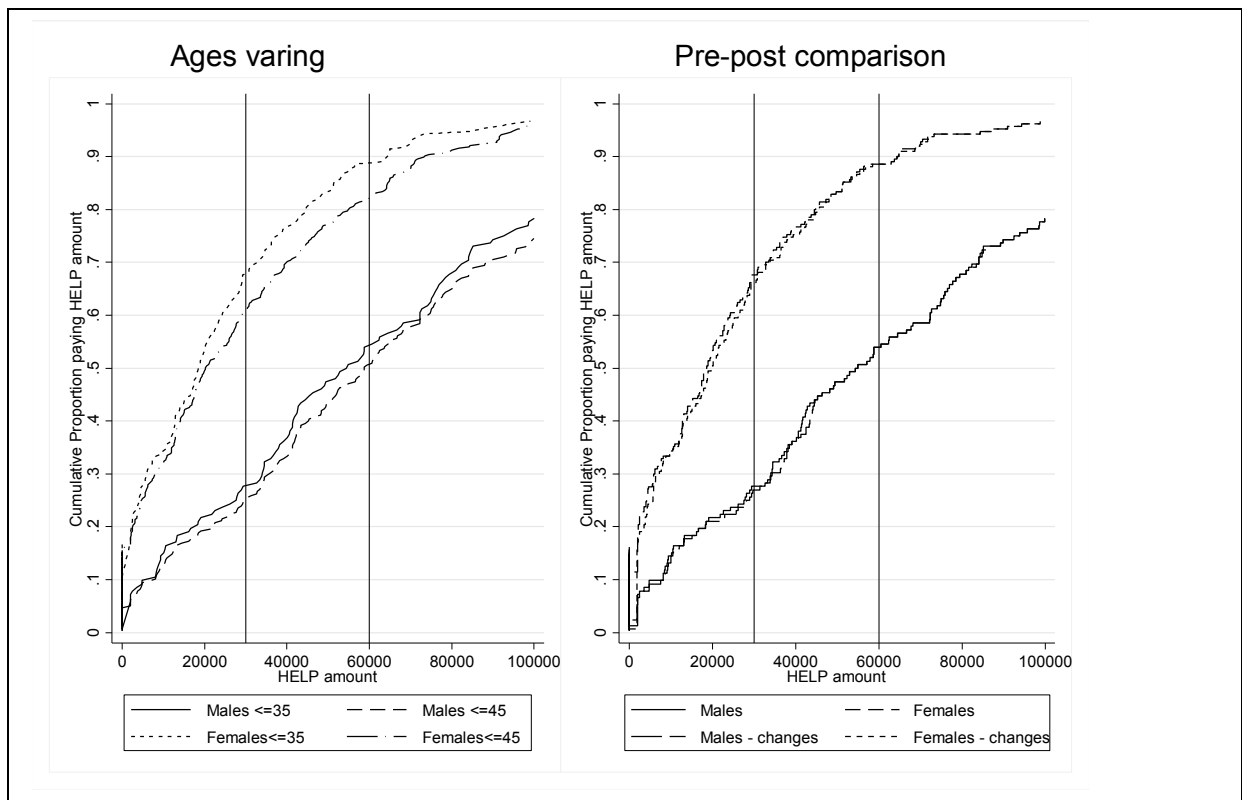


Figure E: Cumulative distributions of hypothetical HECS-HELP payments after 12 years in HILDA data –by age and under current and proposed debt arrangements



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