INCOME CONTINGENT CHARGES FOR HIGHER EDUCATION: THEORY, POLICY AND DATA FROM THE UNIQUE AUSTRALIAN EXPERIMENT

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DISCUSSION PAPER NO. 307

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Abstract

In 1989 the Australian Government introduced the world’s first pay-later charging mechanism for higher education. The so-called Higher Education Contribution Scheme (HECS) requires enrolling students to incur a debt which can be paid back through the tax system depending on personal income. In 1993, in part because of the apparent successful operation of the HECS scheme, the Government introduced an option that allows students to trade in income support grants for higher levels of income contingent loans, again to be paid back according to HECS conditions. Clearly, and recently, the system has moved strongly in the direction of income contingent repayment.

This paper explores the theoretical bases for these policy directions, and examines the consequences the orientation away from a no charge system is likely to have for aggregate demand for higher education and income distribution. The empirical dimensions of the issues are approached through the estimation of private internal rates of return to higher education and net present values of costs under various scenarios of fees and income contingent charges. The bottom line appears to be that income contingent repayment given the Australian parameters has negligible overall effects on the average financial attractiveness of higher education, and can be made to be progressive within the group targeted.
1. Introduction

In 1989 the Australian Government introduced the world's first pay-later charging mechanism for higher education. The so-called Higher Education Contribution Scheme (HECS) requires enrolling students to incur a debt which can be paid back through the tax system depending on personal income. In 1993, in part because of the apparent successful operation of the HECS scheme, the Government introduced an option that allows students to trade in income support grants for higher levels of income contingent loans, again to be paid back according to HECS conditions. Clearly, and recently, the system has moved strongly in the direction of income contingent repayment.

This paper explores the bases for these policy directions, and examines the consequences the orientation away from a no charge system is likely to have for aggregate demand for higher education and income distribution. The empirical dimensions of the issues are approached through the estimation of private internal rates of return to higher education and net present values of costs under various scenarios of fees and income contingent charges. The bottom line appears to be that income contingent repayment both has negligible overall effects on the average financial attractiveness of higher education, and can be made progressive within the group targeted.

3 The origin of the scheme can be found in an independent report commissioned by the Australian Government in late 1987 (Wran, 1988). Bruce Chapman served as a consultant to the Wran Committee.

2 The institution of the new scheme came as a result of suggestions made in an independent review of the student support system (Chapman, 1992).

2. Policy and Theoretical Issues

2 (i) The Policy Background

Higher education in Australia is almost exclusively a public sector endeavour. Up-front fees were charged until the end of 1973 - at the uniform rate of about 15-20 per cent of average course costs - but most students had these waived because of extensive scholarship coverage. In 1987 the Australian Government reintroduced (small) up-front fees across the board in a scheme known as the Higher Education Administration Charge (HEAC). HEAC was slightly less than two per cent of average higher education costs, or $250 in 1986. The policy was abolished in 1989 with the introduction of HECS.

The essential goals for the introduction of income contingent repayment charges were three-fold:

(i) to enable the Government to finance an expanding system with assistance from the direct beneficiaries;

(ii) to redistribute income in a lifetime sense, from those considered to be advantaged (university graduates); and

(iii) to have a charge instituted that did not diminish the access of the poor to the economic advantages of higher education.

Of these the second issue, that of income distribution, was crucial to the political economy of the policy change. The view held strongly by members of the committee recommending the change, and by influential Cabinet Ministers promoting the issue, was that a higher education system which did not require some financial contribution from graduates was in essence inequitable. In terms of both the relative socio-economic background of students, and the

3 The major exception is Bond University, a private institution charging up-front fees (with some scholarships) which was opened in 1987.

4 Only around 20-25 per cent of students paid fees in the early 1970s (Wran, 1988).

5 These were two major forms of scholarship: those from the Commonwealth Government, and those from the various State Government education departments, the latter designed to sustain and stimulate the supply of teachers.

6 For further analysis see Chapman (1988).

7 For compelling evidence on this issue, see Wran (1988).
apparently considerable lifetime income advantages of university graduates, it seemed inappropriate to these commentators to have the direct financing costs underwritten by the average tax-payer who was generally less advantaged than the direct beneficiaries of the process.

The third goal presented a significant challenge to the committee set up to investigate the options. It was understood from economic theory that up-front fees schemes, if financed in part by loans from commercial banks, have the potential to erect barriers to the participation of the disadvantaged through two possible related routes: the potential unavailability of the loans to the most disadvantaged from capital market "failure"; and from the possibility that risk-averse prospective students would be reluctant to undertake borrowing for human capital investments not offering default protection. These factors were crucial to the eventual recommendation of income contingent repayment, and matter significantly for the conceptual and empirical analysis in what follows.

The parameters of the scheme in 1992 were as follows. To gain access to higher education prospective students faced the following choice: to incur a debt of $2250 per full-time year of higher education to be paid back according to personal income; or to pay-up front at a rate 15 per cent below the on-paper charge. Students taking the first route have their outstanding debt annually adjusted by the rate of inflation (but there is no additional rate of interest), and begin repayment when their personal incomes reach the current annual average of Australians working for pay, or $27700 per annum. At this threshold the rate of repayment is two per cent of taxable income (that is, $554 per annum), but it increases to three and four per cent of taxable income respectively at thresholds of about $31000 and $41000.

The charge, which is uniform, apparently represents about 15-20 per cent of average course costs, implying a continuing large tuition subsidy, of around 80 per cent. This, of course, is the charge on-paper, which is necessarily more than the discounted costs to the student given the existence of an interest rate subsidy and with repayment depending on future incomes for the vast majority of students. The extent of the difference is clarified in the empirical analysis.

HECS reflects only the annual course load undertaken by students. However, there are large cost differences between courses, a fact that led the committee recommending the scheme to suggest three different levels of charge; this suggestion was not taken up by the Government. Academic commentators have consistently argued the case for some account to be taken of the large differentials in the costs of provision of courses, essentially through allusion to the lack of a rationale for the heavy cross-subsidies implicit in current arrangements.

2 (ii) Theoretical Issues

Conceptually HECS is a charging mechanism with an income contingent interest free loan. There are three important points relevant to the effects in theory of schemes like it.

The first is that because there is an interest rate subsidy and the repayment is deferred - for some individuals for a very long time - its impact on contemporaneous decisions will be muted. That is, so long as individuals place a greater weight on the present than on the future, the longer is the perceived deferral of a particular cost the less will it affect current behaviour. Of course, if the rate of interest on a debt is high the present value of the cost will concomitantly be greater, meaning that schemes of this type still have the potential to influence behaviour importantly. But the HECS debt has both a low interest rate and arguably high income repayment thresholds, conditions

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8 A more useful way of exploring the point is through consideration of the investment returns to higher education. This is addressed in the analysis following.

9 The "discount" option is in general not cheaper for typical students because the debt incurred is interest free, implying the prospect of important financial advantages from a deferral of the obligation (Chapman and Chia, 1991).

10 An issue not explored here, but of some importance for the policy debate, is the very high implicit marginal tax rate at the first income threshold and the concomitant possibility of former students "rationalising" their incomes to defer the obligation.

11 Some part time higher education students already earn over the first income threshold, implying the payment of the charge at the same time as the courses are undertaken.

12 For example, Law, Arts and Accounting cost less than a fifth of Veterinary Science, Medicine and Dentistry.

13 For example, see Chapman (1985).

14 To make this possibility extreme, imagine a former student never earning a personal income above the first threshold. In that case there will never be any repayment.

15 In technical terminology, so long as individuals' discount rates are greater than zero.
which in combination imply a low potential for the scheme to affect behaviour in the aggregate.

The second important issue is that the nature of the repayment mechanism of loans of this type protects former students from the prospect of default, which would not be true in the circumstances of a fee being financed with a conventional commercial loan. There is no chance of bankruptcy from HECS-type loans, and thus no chance that in the event of non-repayment individuals will lose access to other credit (such as for housing) as a consequence of a diminished loan rating. The benefit is greater the more averse to risk are prospective borrowers.

Third, an implication of repayment depending on income in the presence of an interest rate subsidy is that the scheme is progressive. That is, those that pay most in net present value terms are those that earn the highest incomes most quickly, because they have fewer years in which the subsidy applies. Thus the discounted costs will be lower for groups which experience labour market disadvantage - at least in terms of annual incomes - such as women and Australian Aboriginals. The possible extent of the subsidy involved is illustrated in section 3.

With the policy details as background it is useful to explore in theory what the impact of the institution of an income contingent arrangement would be on the demand for higher education and the costs for students of different approaches. The method adopted here, first described in Chapman and Chia (1989), is to determine the consequences of different scenarios of charges on the individual investment process in higher education. This is now explained.

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16 It is pertinent to point out the default rates of more conventional student loans in other countries are around 15-20 per cent (Wian, 1988). And because these rates apply to a self-selected group who have undertaken debt, they are probably understatements of the expected proportion if the data were unbiased.

17 This is not to suggest that the scheme is more progressive than any other possible approach; the overall lifetime income distribution consequences of fees and charge mechanisms is a subject not directly addressed.

18 This is not unambiguously beneficial, however. Because the repayment unit is that of the individual there is a prospect of adverse selection. Those expecting not to earn high personal future incomes after graduation, such as those expecting not to be in the labour force will be subsidised, with some of this group experiencing high family incomes. The numbers do not appear to be large (Harding and Chapman, 1993).

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2 (iii) The Conceptual Basis for Estimating the Effects of Different Charging Regimes.

An important distinction made by economists is that between consumption and investment. Expenditure on consumption items yields immediate satisfaction or benefits to the consumer but, in contrast, investment items are purchased currently with the benefits accruing only in future periods.

Prior to the early 1960s it was uncommon to regard education as anything more than a consumption item, like food or clothing. But the work of Schultz (1961), Becker (1964), and others dramatically altered the way economists view such expenditures. In his presidential address to the American Economic Association in 1960, for example, Schultz argued strongly for expenditure on education (and, in general, all activities which improve the capacity and productivity of human resources) to be treated as an investment. The essence of the framework is that education provides individuals with an opportunity to acquire "human capital" at a cost (forgone earnings and other direct costs such as fees), with the expectation of higher earnings in the future.

Thought of in this manner, it is sensible to ask how profitable education is relative to other investment opportunities available to the individual. Cost-benefit analysis techniques have been used to demonstrate the private and social profitability of education. From the individual's point of view, profitability (in a wealth maximising perspective) depends on the cost, the expected returns, and the personal discount rate.

Formally, an individual's earning maximisation decision can be expressed as follows. Let the present value associated with the two income streams be denoted by $V_A$ and $V_B$, respectively. Then,

$$ V_A = \sum_{t=0}^{R} \frac{yu}{(1+r)^t} $$

$$ V_B = \sum_{t=0}^{R} \frac{ynu}{(1+r)^t} $$

19 The discussion of this section follows closely that of Chapman and Chia (1989).
where \( Y_l \) and \( Y_u \) are respectively expected net income from higher education use and higher education non-use, \( t \) is time, \( R \) is expected length of time in the work force and \( r \) is the individual's discount rate.

The net present value (NPV) associated with investing in higher education is given by \((V_A - V_B)\). Whenever the NPV exceeds zero, the investment is considered profitable from the individual's point of view, and the rational (assumed to be wealth-maximising) decision would be to enrol.

An alternative way of making the same comparison is to calculate the value of \( r \) which equates \( V_A \) and \( V_B \), which is known as the "Internal Rate of Return" (IRR). The decision rule is that if the IRR exceeds the individual's discount rate the investment is considered profitable, the advantage of this approach being that it presents us with an easily understood summary statistic. More generally, the IRR is a measure of the financial attractiveness of higher education, as changes to its value reflect variations in the private costs and benefits of university graduation. How it might be used to interpret the consequences of different charging regimes is assisted through reference to Figure 1, which shows in a stylised way the financial dimensions of a prospective student's choice using conventionally shaped age-income profiles derived from some of the data used in the analysis following\(^{20}\).

In the first years of the process are the costs - the income forgone from, in this example, four years of full-time study - with the benefits coming later as the additional income of graduates over non-graduates. The IRR associated with the higher education investment process is the rate of interest which equates the present values of the illustrated costs and benefits.

The figure shows also the consequences for prospective students of different charging approaches. An up-front fee effectively increases foregone earnings by reducing student disposable income, in the example to FF. HECS has no effect on student earnings but reduces graduate earnings to the line labelled in the figure 'Graduate Income after HECS'. The empirical implications of various charging approaches are explored later using this framework.

\(^{20}\) The profiles have been drawn from the coefficients estimated from a standard earnings function, a slight innovation being the use of a fourth-order polynomial on potential labour market experience. This explains why the curves are not strictly concave.

\(^{21}\) The issue is considered in the context of the literature and empirically in Chia (1990).
income than will be the case for a 20 year old woman in 1992 observed 40 years later.22

All of the above concerns imply the need for caution in interpretation of results of basic applications of the human capital technique to questions of policy. Empirical adjustments for these problems are left to another day.

3. Empirical Analysis

3 (i) The Questions Asked and the Methods Used

The basic questions to be addressed are: whether or not HECS-type schemes are likely to have significant effects on the demand for higher education; and the extent to which the Australian policy cross-subsidises students who turn out to be relatively less advantaged after graduation (in a personal income sense). The issues are approached through applications of the empirical methods suggested above.

Specifically, IRR calculations are undertaken under various scenarios of fees and charges to illustrate the likely consequences of different policies for the aggregate private financial attractiveness of investment in higher education. As well, to show the extent of the cross-subsidies involved with the current parameters of the scheme, net present value calculations are presented of the costs of HECS for individuals experiencing very different expected lifetime income profiles. The precise approach adopted and the different data sets used are described in the relevant sections.

3 (ii) The Use of the IRR Technique to Show the Effect of Charging Scenarios on the Private Rate of Return to Higher Education

The IRR comparisons are based on the following hypothetical scenarios for typical (defined as statistically average) male and female high school graduates who end up in full-time work. They are aged 18 in 1992 and have to make one of the following choices: to attend university full-time for four years after which employment is undertaken resulting in an expected lifetime income profile of current full-time employed graduates; or to undertake employment expecting to receive the lifetime income profile of current non-graduates who also completed high school.

Three different scenarios of student charges are considered:

(i) zero;

(ii) the 1992 HECS scheme, as explained in section 2; and

(iii) an up front fee of $2250 per year, the on-paper HECS debt.

The following questions may then be addressed. Does the HECS scheme have the potential to have a significant effect on the average return to higher education (compare the IRR associated with scenario (i) with that from scenario (ii))? If the system was instead an up-front fees policy with the same on-paper parameters, would this have discernible effects on the average return to higher education (compare the IRR associated with scenario (i) with that from scenario (iii))? Are the conclusions similar for men and women?

Before proceeding with the reporting of the calculations, it is worth pointing out what may and may not be inferred from the IRR results. As is illustrated in the next part of the empirical analysis, income contingent repayment schemes have the potential to have markedly different effects on the financial attractiveness of higher education between individuals, with expectations of future income being extremely important to this calculation. It follows that strong conclusions on the possible composition of the student body after the imposition of HECS cannot be drawn from an analysis of likely changes to the average; of interest, but not pursued here, is that the scheme seems to benefit those at most risk of pursuing other activities given the institution of charges.

The income information is drawn from the sample file of the Australian 1985/86 Income Distribution Survey. These are extremely good quality data and the number of observations is adequate for a useful analysis.24 The income profiles are for both males and females and have been inflated to 1992 dollars

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22 This issue is explored, and the point substantiated strongly, in Beggs and Chapman (1988).

23 This point is explained and confirmed in Chia (1990).

24 After defining the samples to suit the scenarios, there were around 630 male and 420 female graduates, and respectively around 770 and 760 male and female non-graduates who completed high school but received no additional formal education.
(using increases in average weekly earnings by sex)\textsuperscript{25} and adjusted for single person tax rates.

The survey contains data on age, sex, school-leaving age, and details of post-school qualifications. The amount the individual received in 1985/86 from many different sources is known, including: wages and salary; own business or farm; own partnership; and unemployment benefits. Only earned income for those working full-time and year-round was used in the analysis\textsuperscript{26}.

For the hypothetical individuals described below a graduate is defined as anyone with a Bachelor or higher degree or post-graduate diploma, and a high-school leaver is defined as anyone who finishes school at age seventeen or above and does not possess any post-school qualifications. The data do not permit us the luxury of more disaggregated analysis.

The net income received whilst studying has the potential to have a major impact on calculations of the IRR to higher education. The Commonwealth Department of Employment, Education, and Training (1987) estimated that in 1984 the average course-related expenses (union and general service fees, cost of books, stationary equipment, materials, etc.) for a university undergraduate amounted to $595. Also, the data reveal that university students not on student assistance schemes averaged $1,483 in income from employment during the year\textsuperscript{27}. Converting these figures into 1992 annual dollars and rounding off, it is assumed that the direct cost to the individual of studying amounts to $900, earnings are $2270, leaving adjusted student income at $1370.

These data make up part of the average income profiles for full-time year-round workers derived directly from the IDS, which are presented in pre-tax form in Figures 2 and 3. The data illustrate what is very familiar to students of Australian (and other countries') age-income profiles: a clear cost and benefit associated with investment in higher education; and a relative steepness in the more highly educated profiles.

The question for university attendance is whether or not to incur the discounted cost of the forgone earnings in order to derive the investment return in the form of higher future earnings. The approach allows useful comparisons of the likely consequences for aggregate student demand given that no fees, income contingent charges and up-front fees will have different effects on the time stream of the costs and benefits in the investment process. As noted, inferences drawn to the marginal responses to policy change are being made on the basis of the variations calculated at the average.

Figure 2
Full-time and Year-round Male Graduate and Non-Graduate Average Age Income Profiles (before tax)

\begin{figure}
\begin{center}
\includegraphics[width=\textwidth]{figure2.png}
\end{center}
\caption{Full-time and Year-round Male Graduate and Non-Graduate Average Age Income Profiles (before tax)}
\end{figure}

Figure 3

\begin{figure}
\begin{center}
\includegraphics[width=\textwidth]{figure3.png}
\end{center}
\caption{Full-time and Year-round Male Graduate and Non-Graduate Average Age Income Profiles (before tax)}
\end{figure}

\textsuperscript{25} Under the assumption that the average male and female graduate incomes increased by the same percentage as did the respective average weekly earnings for males and females.

\textsuperscript{26} This is defined as the sum of the pre-tax incomes from wages and salaries, and from own business, trade or profession. No adjustments have been incorporated for investment income or superannuation. This is likely to mean an understatement in calculated rates of return to higher education.

\textsuperscript{27} Those on student assistance, on the other hand, received an average of $2,565 in income support during the year (1984 dollars) and earned an average of $865 during the year.
The results are presented in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>IRR (% p.a.)</th>
<th>Percentage point difference to 1</th>
<th>Proportion of 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario (i): No Charge</td>
<td>7.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario (ii): HECS</td>
<td>7.30</td>
<td>-0.55</td>
<td>0.93</td>
</tr>
<tr>
<td>Scenario (iii): Up Front</td>
<td>7.00</td>
<td>-0.85</td>
<td>0.89</td>
</tr>
<tr>
<td>Charge of $2250 p.a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario (i): No Charge</td>
<td>8.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario (ii): HECS</td>
<td>7.67</td>
<td>-0.47</td>
<td>0.94</td>
</tr>
<tr>
<td>Scenario (iii): Up Front</td>
<td>7.31</td>
<td>-0.83</td>
<td>0.90</td>
</tr>
<tr>
<td>Charge of $2250 p.a.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table should be read as follows. For each scenario the first, second and third columns show respectively the average IRR to higher education, the percentage change to the IRR from the first scenario, and the IRR as a percentage of that associated with the first scenario.

The following four points are of most interest. First, as is usually found, the average IRRs are high (in real terms) and relatively so for females. Males and females receive on average respectively around 7.8 and 8.1 per cent return per annum to the investment in higher education. In a qualitative sense the results are similar to those revealed in a host of other Australian studies.

By way of qualification is that there are several factors at work here which imply biased upwards estimates of the return to higher education. One is from the data used in that the returns to a four year degree have been calculated using the broad category of "graduates", which includes a small proportion of higher degree holders. Another concern, which is well known, is that the so-called returns to educational investments include also the returns to "ability" and "motivation", variables which are often argued to be positively correlated with both levels of education and earnings (Grilliches, 1976).

The second result of note is that the imposition of HECS (necessarily) reduces the average financial attractiveness of higher education (comparing scenario (i) with scenario (ii)), but the extent of the decline is low, of the order of around 0.5 of a percentage point for the average of males and females. The small decline helps explain why the policy has had no obvious effects on the overall demand for higher education places (Chapman, 1992).

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28 A reasonable approximation of the real long run rate of interest in Australia would be about 5 per cent per annum.
29 The latter point, due to the difference between female graduate and non-graduate income, is mainly because female graduate labour force participation and hours worked are high relative to those of non-graduate females (Beggs and Chapman, 1988). In the sample this means that the women observed participating fully as graduates will have a higher level of labour market experience and thus income than the non-graduate women observed participating fully.
30See, for example, Blandy and Goldsworthy (1975), Miller (1982) and Chapman and Chia (1989).
31 Relatedly, the estimates do not correct for the self-selection process in which those involved in higher education are more likely to be individuals with a comparative advantage in this activity (Vella and Gregory, 1992).
32 The story is a bit more complicated than this, however, because at the same time as the Government introduced HECS it abolished the Higher Education Administration Charge, a relatively small up-front fee. This action by itself would have increased the internal rate of return to education.
Three, as must be expected from the presence of an interest rate subsidy, the HECS arrangement has a smaller effect on the average returns from higher education than does an equivalent on-paper up-front fee. For both males and females a conventional fee reduces the private return by about 0.8 per cent per annum, or about 35 per cent more than does the pay-later approach. This is consistent with a theme of this paper: with HECS there is a subsidy from the lack of a real interest rate and the pay-later provisions of the scheme, a point explored differently in the section following.

In theory the above comparisons of the change in the IRR from higher education between up-front and pay-later charging regimes will understate the benefits to students of the latter, so long as students are risk averse. This is because some students will attempt to finance the up-front fee payment through borrowing (if available) from a commercial bank, loans which will have repayment conditions that are time and not income contingent. The essential point from this is that normal loans do not offer insurance against default, implying the possibility of future financial stress and a poor credit rating. But because HECS debts offer default protection, there is no prospect of former students facing bankruptcy or the need to sell assets to meet the repayment obligation.

Finally, the comparisons between the sexes reveal that the HECS system compared to up-front fees relatively advantages women, albeit slightly for the

33 That is, in proportionate terms the IRR fell to about 9 of the no charge scenario compared to about 34 from HECS.

34 Of interest is that the Government offers a 15 per cent “discount” for up-front payment of HECS. The above result, confirmed by Chapman and Chia (1989), suggests that the average full-time student is probably better off paying back later.

35 For strong empirical support of this proportion through the calculation of risk-adjusted returns, see Chia (1990).

36 Of course, as is well known, financial markets with respect to borrowing for human capital investments may not allow students the opportunity to borrow in any case (Chapman, 1992). The existence of such a liquidity constraint increases considerably the effects of up-front fees on student access to higher education.

37 However, it would be possible to design an income contingent scheme that offered little protection by having a very low income threshold and/or very high rates of annual repayment. In New Zealand, for example, an income contingent student loans scheme was instituted in 1991 which is less likely than HECS to offer default protection in that the first income threshold for repayment is about a third of that applying to HECS. Even so, in that country there is no evidence of deleterious effects, in part presumably because the annual rates of repayment are smaller than the lowest levels.

sample considered. This comes about essentially because groups with lower expected lifetime incomes receive greater subsidies from schemes of this type. It should be stressed that the data used here - for full-time year-round workers - biases downwards the relative advantages for the average female graduate of the income contingent mechanism. This is because the average woman will earn much less relative to the full-time woman than will be the case for men, given that the labour force participation rates and thus the average incomes of women are relatively low.

The bottom line is fairly clear. HECS has little effect on the average private investment returns to higher education and the average IRR is reduced by a higher amount from an up-front fee of equivalent on-paper magnitude. Importantly, the calculations are likely to underestimate the extent to which the HECS arrangements relatively advantage prospective students. This is because with an up-front fee some students will require commercial bank loans, which will be less attractive for the risk-averse because of the possibility of default, a prospect which doesn’t exist under HECS.

3 (iii) Examining Present Values of HECS Repayments: An Illustration of Cross Subsidies

One implication of the nature of the HECS policy is that there are cross-subsidies between both individuals and the courses undertaken because of the nature of the conditions of charges and repayment. An interest rate subsidy determined by the profile of lifetime expected incomes must mean very different (net present values) of the HECS charge for individuals. The point now examined relates to the potential for HECS to mean a lower charge for individuals whose future personal income circumstances are relatively poor.

To address this issue it is possible to illustrate the potential differences in the prices faced by calculating the present value of a HECS-type charge for different assumptions concerning fairly extreme expected future incomes. Three possibilities are offered: for average Australian male lawyers, New

38 This point is illustrated empirically in Chapman and Chia (1989).

39 For many, of course, these will not be forthcoming anyway, given the inherent financing problems associated with investments in human capital (Chapman, 1992).
South Wales (NSW) Teachers, and NSW Teachers who spend five years out of the paid labour force from age 25 to 30 (thus repaying none of their interest free debt at that time). The different scenarios and data have been chosen to show a range of possible experience, from the very high personal incomes of male lawyers to the fairly low personal incomes of teachers who intend to spend a period outside the labour force (and thus not repaying any of their debt for that period).

Figure 4 shows the (before tax) income profiles for 1992, with that of male lawyers being derived from Blandy et al (1992) and the teachers' being constructed from current legally binding award wages.

Figure 4
(Smoothed) Male Lawyer and Teacher Award Age Income Profiles ($1992)

Since both education and law are courses of similar duration, the experiment can be simplified by assuming that the charges are equal to the 1992 HECS for a four year degree, or $9,000 in total. The present value of the charges are calculated at age 18 and, because there is no generally acceptable discount rate, the calculations are presented for rates of both 5 and 10 per cent.

Table 2 presents the results, with columns (ii) and (iii) respectively being for teachers spending 5 years out of paid work from 25 to 30, and teachers remaining in full-time work until the debt is completely discharged.

<table>
<thead>
<tr>
<th>Discount Rate (per cent)</th>
<th>Male Lawyers (i)</th>
<th>4 yr NSW Teachers (a) (ii)</th>
<th>4 yr NSW Teachers (b) (iii)</th>
<th>(ii)/(i)</th>
<th>(iii)/(i)</th>
<th>(ii)/(iii)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>$6020</td>
<td>$4317</td>
<td>$5282</td>
<td>71.72</td>
<td>87.74</td>
<td>81.73</td>
</tr>
<tr>
<td>10</td>
<td>$4140</td>
<td>$2237</td>
<td>$3231</td>
<td>54.03</td>
<td>78.03</td>
<td>69.24</td>
</tr>
</tbody>
</table>

(a): For teachers who spend five years out of the paid work force, from ages 25 to 30; (b): For teachers who remain continually in full-time employment.

Several significant points follow from the data of Table 2. The most obvious is that the cost to the individual of repaying the HECS debt depends very much on the expected future income stream. For example, at low and high rates of discount respectively, those expecting to be employed as full-time continuous teachers and spending five years not in the labour force after beginning their careers will pay about 70 and 55 per cent of the debt that will be incurred by those expecting to earn the incomes of male lawyers participating fully in their careers (see column (iv)). In other words, and as suggested in the conceptual discussion, the HECS scheme subsidises those who are least likely to be personally advantaged from the investment process.

Second, it is clear that those former students progressing to a low income occupation, NSW teachers, will be given a significantly higher HECS subsidy if they spend time outside the full-time labour force. In present value terms its extent seems to be between 20 and 30 per cent (see column (vi)). Thus

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40 NSW is Australia's most populous state.
41 This a fairly realistic example at least for women, given that estimates based on 1986 data suggested that the labour force participation of women falls to about 20 per cent between the ages of 25 and 30 (Beggs and Chapman, 1988).
42 The Australian award wage system means that a large majority of workers are in occupations with legally set pay. The profile used here is that of the minimum given levels of seniority.
HECS offers financial advantages to those who intend to spend periods away from paid work, an example being through the full-time rearing of children.

As well, and obviously from the above, for those expecting to participate fully in the labour market, there is clearly a cross-subsidy relative to the highest income recipients. Column (v) suggests that this is between 12 and 22 per cent.

A further point is worth making on the calculations. It is that the charge facing the student under HECS is likely to be influenced considerably by the zero real rate of interest applying to the debt. If a market rate was charged - which would be up to 5 per cent (in real terms) higher - the redistribution and cost differentials of having different expectations of future income would probably fall significantly. There is a trade off here for policy: putting a real rate of interest on income contingent loans means that the charge is more likely to reflect the opportunity cost of the debt, but in so doing the policy is less likely to offer progressive lifetime income redistribution within the graduate group.

4. Conclusions

There are sound reasons - at least in terms of lifetime income distribution - for charging students for the use of publicly-funded higher education institutions. The clearest of these is that those with access to the system seem to be advantaged in socio-economic terms, and the evidence is strongly consistent with the notion that there are positive lifetime income consequences from the investment. But in international terms until recently there seemed only to be one way of doing this - with up-front fees, an approach arguably associated with less access of the financially disadvantaged to higher education than is desirable.

Australia has recently done it differently. Student charges for the use of higher education were instituted in 1989, but they have to be paid when and only if the former students' personal incomes are relatively high - above the annual incomes of all those working for pay. For the first time there is a income contingent repayment scheme for the use of higher education.

The analysis presented has attempted to put into historical, theoretical and policy perspective the development of Australia's income contingent charge scheme. As well, several empirical questions related to the effects of HECS have been addressed. They are the likely consequences of a scheme on the average private return to higher education, and the potential for policies of this genre to redistribute disposable income within the affected group. The latter exists because of the presence of an interest rate subsidy sensitive to the expected future income prospects of students.

The results are fairly clear, even if the data and methodology used are limited. One is that schemes like this are unlikely to affect markedly the overall demand for higher education, a point implied by the similarity between internal rates of return from the investment of having no charge compared to HECS. As well, a comparison presented of the differences between income contingent charges and up-front fees, which certainly favours the former in terms of the implications for student demand, probably understates the advantages to students of the Australian approach; the reason is that there is default protection inherent in non-commercial loan mechanisms of the HECS type.

The second major point from the conceptual and empirical analysis is that - so long as there is an interest rate subsidy - income contingent repayment mechanisms are progressive within the (personal) lifetime income distribution of those affected. That is, former students who earn relatively low incomes pay less in present value terms than those who receive high incomes. The extent of the subsidy involved can be fairly high, as has been illustrated through reference to several extreme possibilities.

In short, the exercise highlights the obvious fact that income contingent higher education charges can and do exist, and demonstrates some of their possible consequences. Schemes of this type can be designed to limit the effects on student demand from the institution of a charge, as seems to be the case with HECS. At the same time income contingent approaches mean that financial resources can be derived from the direct beneficiaries of higher education in a

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43 The internal rate of return calculations presented above support this proposition.

44 The evidence on enrolments in the 1989-93 period is consistent with the prediction in that they have increased considerably. Not too much should be made of this however, because actual demand responses are not observable, given that the system is typically one of excess demand.
progressive way that protects the future disadvantaged of those undertaking higher education.

In theory, and now apparently in practice, there are good reasons for considering the adoption of income contingent charges in other countries. The Australian approach might form a useful framework for analysing the implications of such policies, particularly with respect to issues of access and the effects of income contingent repayment on income distribution. Even so, judgements of the desirable parameters of similar schemes would need to give due weight to the exigencies of different institutional environments.\footnote{For a possible application of similar ideas in the British context, see Barr (1989).}

References


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