

# **HECS AND OPPORTUNITIES IN HIGHER EDUCATION :**

**A paper investigating the impact of the  
Higher Education Contributions Scheme  
(HECS) on the higher education system**

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## Executive Summary

The Higher Education Contributions Scheme (HECS) was introduced in 1989 as an innovative means of financing large scale expansion of the higher education system. At the time, the introduction of income contingent loans was perceived as a more appropriate means of seeking a greater contribution from individuals towards the cost of their education while minimising potential adverse impacts on participation. This paper explores whether HECS has acted as a disincentive to higher education and, in particular, whether particular groups have been adversely affected by HECS and subsequent changes to the system.

The paper first considers the impact of HECS on disposable income. With the introduction of HECS, persons with an annual income of \$30,000 paying off a HECS debt experienced a fall in their disposable income of around \$15 per week. This increased to around \$50 per week for persons with an income of \$50,000. Among the 1996 reforms to the HECS regime, probably the most significant in terms of its impact on disposable incomes was the lowering of the repayment threshold from \$28,495 to \$20,701. Persons within this income range experienced falls in disposable incomes of between \$12 and \$24 per week. The lower repayment threshold is more likely to have deterred persons from combining work and part-time study. Full-time students, given they have lower incomes, were less likely to have been affected by the lower threshold.

The paper investigates the impact of HECS on the demand for higher education as measured by applications through State Admissions Centres. Our analysis found that the demand for higher education among school leavers increases in line with the number of persons completing Year 12. We found only weak evidence that the number of Year 12 school leaver applications responds to labour market conditions (though this is in addition to the impact of labour market conditions on the Year 12 retention rate). However, the introduction of HECS in 1989 did not deter interest in higher education among school leavers. We found that the 1996 HECS changes reduced demand for higher education among school leaver applicants by around 9,000 students per year. These findings contrast with those from an earlier study (Andrews, 1997) showing that the introduction of HECS discouraged school leaver interest in higher education but the 1996 HECS changes had not lowered demand. This suggests the need for caution in interpreting the influence of HECS on the demand for higher education among school leavers

We found that interest in higher education among 'mature age' persons was unrelated to the size of the feeder population, though the evidence suggests there has been a steady upward trend in demand for higher education among this group. Our analysis shows that 'mature age' applications for higher education increase as unemployment rises. The introduction of HECS in 1989 did not deter interest in higher education among 'mature age' persons. Rather, any negative effects from HECS were swamped by other unspecified factors, such as the general expansion of places at the time, increasing demand by around 9,000 persons per year from 1989 onwards. We found that the 1996 HECS changes lowered demand for higher education among 'mature age' applicants by around 17,000 persons per year.

The impact of HECS on different groups in the student population is an important issue. We reviewed the impact of the 1996 HECS changes on patterns of commencing students. It does appear that older persons were more sensitive to the 1996 HECS changes, though it must be said that the evidence is indicative rather than being strongly conclusive on this point. In particular, older persons new to higher education, studying part-time or externally appear to have been more responsive to HECS changes than other groups. However, it is important that these changes are

kept in perspective. For example, the participation rate of 40-44 year-olds fell from 0.38 per cent in 1996 to 0.31 per cent in 2001. Overall, it seems reasonable to conclude that the balance of the student population has changed, with fewer older students, especially those new to higher education or studying part-time or externally, in response to the 1996 HECS changes.

An ongoing concern has been the impact of HECS on persons from different socio-economic status (SES) backgrounds. The evidence suggests that opportunities for higher education among persons from a low SES background have increased in line with the overall expansion of the higher education system, though the share of low SES has been remarkably unchanged over time. Importantly, in terms of the analysis in this paper, the introduction of HECS and its variants since that time, have not discouraged overall participation in higher education among persons from a low SES background. That said, the share of males from a low SES background in HECS Band 3 courses (the most expensive) declined appreciably, by 38 per cent, following the introduction of differential HECS charges. This directly affected a small number, around 100 persons, in comparison with the size of the overall domestic student population.

In summary, the 1996 changes to HECS, as theory would suggest, have had some impact on the demand for higher education. These changes need to be evaluated in the context of the large scale expansion of the higher education system that occurred during the 1990s. Arguably, HECS has played a major role in expanding access to higher education. The lesson from this study is that any future changes to HECS arrangements would need careful design to minimise their impact, particularly among groups more sensitive to student charges.

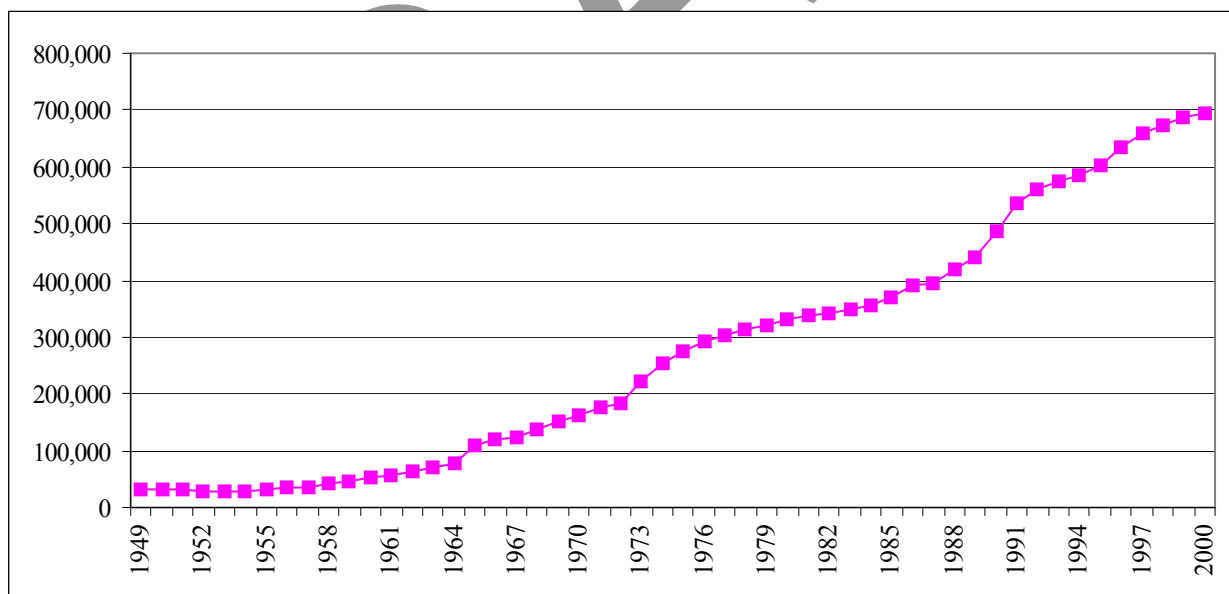
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## I Introduction

The introduction of the Higher Education Contributions Scheme (HECS) in 1989, seeking a greater contribution from individuals towards the cost of their higher education, has continued to attract widespread commentary and interest both in Australia and overseas. At the time, the introduction of a system of income contingent loans was perceived as an innovative means of student financing. That said, there have been concerns raised from time to time about whether HECS has acted as a disincentive to the pursuit of higher education. In particular, an issue frequently raised is whether some groups are more likely to have been dissuaded from entering higher education as a result of the imposition of a student charge.

At the outset, it is important to consider these issues in historical context. Assessment of the impact of HECS needs to be considered in the context of major structural reforms and financing of higher education and the changing balance of public/private funding of higher education over time. While the higher education system has steadily expanded over time, of particular interest are the two periods of very rapid expansion in student numbers in the early 1970s and late 1980s/early 1990s as shown in Figure 1. It is noteworthy that the character of the growth in student numbers was very different in each period. In the early 1970s, expansion was associated with the Commonwealth government assuming a major financing role in higher education and a rapid increase in public funding. By way of contrast, expansion in the latter period was associated with the moves towards a Unified National System of higher education and a shift towards greater private financing of higher education through the introduction of HECS.

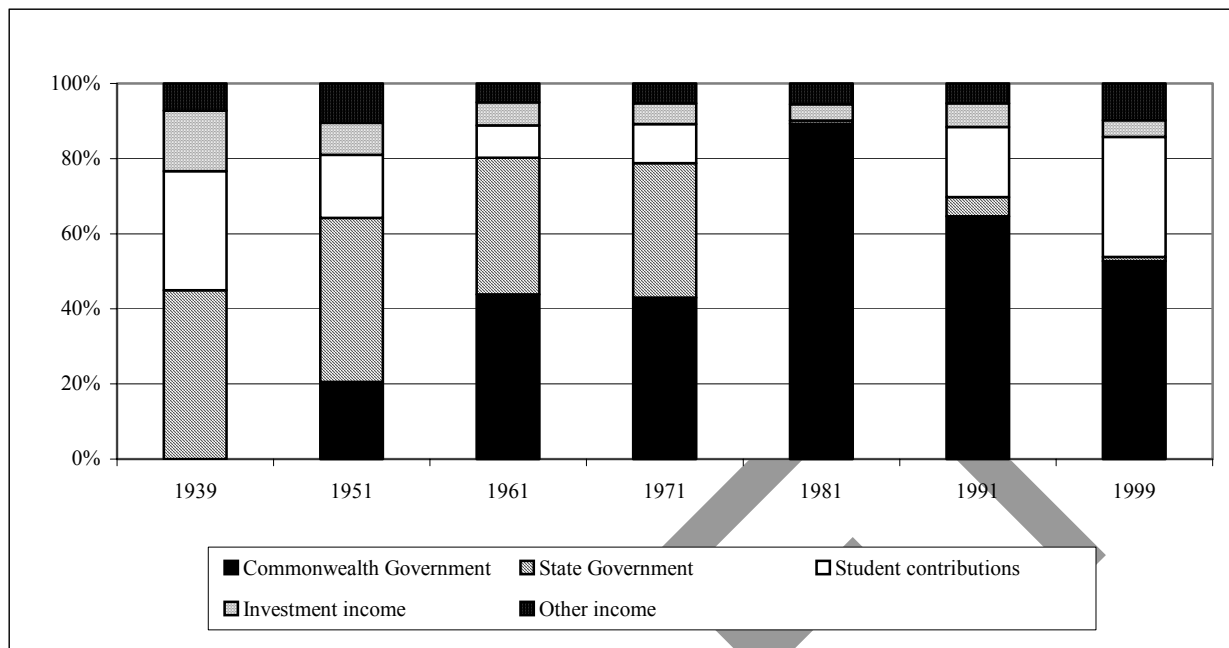
**Figure 1 : Enrolments in Higher Education, 1949 to 2000**



Source: DETYA (2001), Higher Education Students Time Series Tables, 2000: Selected Higher Education Statistics.

A longer run perspective demonstrates that there have been very radical shifts in the balance of public/private funding of higher education over time.

**Figure 2 : Higher education income by source, 1939 to 1999<sup>1</sup>**



Sources : DEET (1993), National Report on Australia's Higher Education Sector, DEET (1991), Selected Higher Education Statistics, DETYA (1999), Selected Higher Education Statistics, Finance 1999

The pattern of university revenues in 1999 is not very different to that of a much earlier era in 1939 before World War II when the character of the higher education system was very different. In 1999, government funding, almost entirely Commonwealth, accounted for approximately half of university revenues. In 1939, universities were similarly reliant on public funding, but in this era State governments were the sole source of public funds. Student contributions accounted for around one third of university revenues both at the beginning and the end of period under review. By way of contrast, following the abolition of fees by the Whitlam government in 1974, the pattern of university revenues over the 1970s and 1980s was markedly different. The Commonwealth was by far and away the dominant source of funds, accounting for almost ninety per cent of university revenues while there were no student contributions.

The purpose of this paper is to examine the impact of HECS, in its various manifestations, on opportunities in higher education. First, did the introduction of HECS in 1989 deter interest in higher education? Did the 1996 changes to HECS have a separate impact? Has HECS had a differential impact on different groups in the student population? In the next section of the paper we present some of the arguments advanced in the late 1980s in support of the introduction of HECS and provide a brief summary of the evolution of the scheme over the last decade. We also highlight key concerns raised from time to time about HECS. In the third section, we review previous studies examining the impact of HECS. The fourth section provides the substantive part of this paper. We present findings of the impact of HECS on disposable income, on the demand for higher education, on patterns of commencing enrolments among different groups in the student population and in particular among persons from different socio-economic

<sup>1</sup> In 1991 and 1999 we nominally source 25 per cent of HECS revenues to the Commonwealth Government rather than student contributions. The Commonwealth Government is, in effect, the source of revenues where students receive a discount on upfront HECS payments or where HECS debts are forgone as a result of students' incomes not meeting repayment thresholds or due to deaths or emigration.

status backgrounds. We then discuss these findings in the context of the evolution of the higher education system. The conclusions form the fifth section of the paper.

## **II HECS – A Short History and Rationale**

The reforms of higher education in the late 1980s from a binary system of universities and colleges of advanced education towards the Unified National System had, as one of their major objectives, the long term expansion of the system. The Government of the day expressed a desire that the benefits of access to higher education be shared more widely and equitably (DEET, 1988, p. 2). Factors perceived to underly the future expansion of higher education were population growth, rapid increases in the feeder group of Year 12 completions (the Government intended that retention rates would increase substantially to 65 per cent, up from around 30 per cent in the early 1980s), increasing participation of disadvantaged groups, increasing mature age participation as a result of workforce demands for adult training and higher labour force participation among women. These factors coincided with a major recession in the early 1990s, which itself increased the attraction of education. Thus cyclical economic factors also contributed to rapid increases in demand for education at about the same time.

The Government stated that it would agree to expand growth in the higher education system in line with rising student demand, labour market conditions but also, importantly, budgetary constraints. It had indicated that it would be difficult for the Commonwealth alone to provide for a significant expansion of the system. In this context, the Wran Committee was established to explore options seeking greater contributions from students, graduates, parents and employers. Prior to this, a Higher Education Administration Charge of \$250 per student per annum had been introduced from 1987. The Committee concluded that, ‘on historical and overseas precedents, it is not unreasonable to expect higher education users to contribute around 20 per cent of the average total costs of incurred by the Commonwealth Government (for higher education)’ (Wran Committee, 1988, p.54).

The Wran Committee rejected options of fees and commercial loans for fees along familiar grounds. Payment of upfront fees might represent a substantial obstacle to access to higher education for those without the immediate resources to finance such access. Granting exemptions from fees for disadvantaged students as a solution to this problem was seen as still creating equity problems for some groups, for example those immediately above the cut off point for fees exemption. An alternative approach considered was fees financed by commercial loans. The key problem with commercial loans is that it is difficult to borrow funds to invest in human capital because that capital cannot be offered as collateral for that loan (Becker, 1993, p.93). Therefore, where other resources must be used as collateral, students and/or parents with lower wealth and income are less likely to invest in education and, in addition, commercial institutions will be reluctant to lend to students from low income families. The Wran Committee suggested that students might be discouraged where they face immediate repayments, even while studying, given relatively fast repayments sought on commercial loans. Another problem with commercial loans is that any default would affect future credit ratings, providing an additional deterrent to undertaking study.

The Wran Committee recommended the introduction of an income contingent student charge with the objectives of raising ‘contributions from direct beneficiaries of higher education to alleviate current inequities, to finance growth and to enhance access to higher education’ (Wran Committee, 1988, p. 79). The Government of the day rejected recommendations that different charges be aligned to courses with different costs, instead introducing a uniform charge for all

courses, equivalent to around 20 per cent of average course costs. Key features of the scheme were that students could elect to pay their contribution up-front receiving a 15 per cent discount. Alternatively, students could defer repayments until their income exceeded a certain threshold. The deferred income contingent repayment vehicle was seen as strong move towards achieving equitable access to higher education. Thus students who did not have the immediate capacity to pay would not be precluded from accessing higher education. HECS debts were indexed by the CPI, but with no additional interest rate attached. This latter feature implied a substantial subsidy in the loan arrangements by the Government and considerably enhanced the appeal of the scheme to students.<sup>2</sup>

In the 1996 Budget, the Government undertook a large scale program of fiscal consolidation to which the higher education sector was required to contribute. In addition to changes in higher education funding arrangements, the Government also announced substantial changes to the HECS regime. Higher and differential HECS charges were introduced on the grounds that the private returns to higher education were substantial and that HECS represented a considerable variation in course costs, ranging from 36 per cent of the costs of an arts course to 13 per cent of the costs of a medicine course (Andrews, 1999).

First, there was a relatively substantial increase in HECS charges, on average, in real terms of 65 per cent from the flat rate HECS contribution prevailing in 1996 of \$2,442. This was the average increase allowing for the distribution of students across the three HECS bands introduced in 1997.

Second, the three HECS bands introduced varied according to course costs and the average earning potential of graduates from those courses. Law, medicine, dentistry and veterinary science were placed in HECS Band 3 with a HECS contribution of \$5,500 (a real increase of 122 per cent), science, engineering, agriculture, architecture and business/economics were placed in HECS Band 2 with a HECS contribution of \$4,700 (a real increase of 90 per cent) and arts, education and nursing were placed in HECS Band 1 with a \$3,300 contribution (a real increase of 33 per cent). Nursing courses were placed in HECS Band 1, though they are high cost, primarily on the basis of their relatively low earning potential.

Third, students were required to repay their HECS debts at a faster rate. The income repayment threshold was lowered from \$28,495 in 1996-97 to \$20,701 in 1997-98. This followed changes in the previous year in 1996-97 increasing the top repayment rate from 5 per cent to 6 per cent with the introduction of additional intermediate repayment thresholds of 3.5 per cent, 4.5 per cent and 5.5 per cent. (The additional repayment rates were announced in 1995, but implemented in 1996-97, and strictly speaking were not part of the 1996 HECS changes).

While the 1996 Budget measures (hereafter referred to as the 1996 HECS changes, though noting from above that their implementation may have occurred at a slightly later date) represent the most significant changes to HECS since its introduction in 1989, there have been a number of ongoing changes to repayments rates and conditions over time. Appendix A provides a comprehensive coverage of changes in HECS arrangements between 1989 and 2000 for the interested reader.<sup>3</sup>

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<sup>2</sup> The arrangements also included an additional implicit subsidy because of the treatment of debts of students whose subsequent incomes meant that the debt would not be repaid.

<sup>3</sup> The introduction of the Postgraduate Education Loans Scheme (PELS) from 2002 represents an important variation on the theme of income contingent loans (see DEST, 2002). The Commonwealth sets the contributions to be paid by students enrolling in postgraduate HECS liable courses. By way of contrast, institutions determine fees

Why should we be concerned with the introduction of HECS and the subsequent changes to the scheme? The introduction of HECS raises the costs of undertaking higher education and this may potentially discourage individuals from participating in higher education. Under a human capital framework, education is viewed as an investment in human capital. Individuals invest time and money in acquiring higher education in the expectation of securing higher incomes in the future. Individuals make decisions to invest in higher education after comparing the expected returns with costs, that is, the profitability or rate of return from investment in higher education. Prospective benefits include the monetary advantages of better labour market prospects, higher earnings and lower unemployment, and non-monetary benefits associated with the acquisition of knowledge. The costs of higher education include opportunity costs of foregone income while studying and not working, extra living expenses associated with studying and direct tuition costs. The introduction of HECS raises the costs of education, whether it is paid up-front or deferred. A priori, increasing the costs of higher education might be expected to discourage some individuals from accessing higher education. The critical issue is by how much and which groups?

Issues for consideration are, by how much do HECS repayments change disposable income and a corollary, how does this change the rate of return to higher education? With the introduction of differential HECS, do different charges for different courses make a difference to subject choices? Since one of the major objectives of the HECS scheme is to overcome problems of equity associated with other student financing arrangements, has the introduction of HECS influenced the pattern of enrolments among different groups in the student population? In particular, has it had a differential impact on persons from different socio-economic status backgrounds? The remainder of this paper will address these issues. Where possible, we will endeavour to focus on orders of magnitude of any changes that may have arisen from the introduction of, or changes to HECS. In the next section of the paper, we briefly summarise findings from earlier research that addresses these issues.

### **III Previous studies**

Evidence on the impact of HECS on the rate of return to higher education, though sparse, is somewhat mixed. Borland (2001), using data from the ABS, 1997 Training and Education Experience Survey (TEES) estimated that the average rate of return to higher education had fallen to 14.5 per cent in the post HECS era. The base case in this study assumed the average individual paid HECS Band 2 contributions up-front, though payment according to different HECS Bands or deferring payment was found to have little impact on the estimated rate of return. Borland reviewed earlier studies of rates of return to higher education and concluded that 'estimates of the rates of return from the post-HECS era are uniformly lower than from studies undertaken in the pre-HECS period' (Borland, 2001, p. 2). Borland estimated that removing HECS payments would have the effect of boosting the average rate of return to 18.5 per cent.

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that students must pay in non-research postgraduate fee-paying courses. From 2002 students enrolled in non-research postgraduate fee-paying courses will have the option of taking out a PELS loan to pay for tuition fees set by their institution. The objective of PELS is to remove potential barriers to investment in postgraduate education arising from the requirement to pay up front fees. The PELS loans will work in exactly the same way as the HECS deferred payment arrangements. Indeed, it is quite likely that students will add a PELS debt on top of their existing HECS debt. In purely administrative terms, amounts of HECS and PELS debts will be added together and treated as one accumulated HECS debt. Where students exceed the relevant income thresholds, they will make one compulsory HECS repayment each year based on the accumulated HECS debt, inclusive of any PELS debt.

Chapman and Salvage (1997) examined the impact of the more recent changes to HECS arrangements in 1997 on the financial rates of return to school leavers undertaking higher education. They found that the changes had not greatly decreased the high rates of return to higher education. Consequently, they concluded that participation in higher education was likely to have remained financially attractive.

These findings are essentially theoretical. Andrews (1997) examined changes in the rate of applications to higher education institutions following the introduction of HECS in 1989 and the major reforms to HECS in 1996. The study concluded that the introduction of HECS in 1989 may have dampened demand for school leavers and the 1996 changes may have had the effect of lowering demand for higher education among mature age persons. Andrews suggested that the introduction of HECS had a small effect on school leaver applications, falling by around 20,000 persons or 14 per cent of applications. Conversely, the level of applications from mature age persons did not appear to have been affected by the introduction of HECS. However, the study found that the 1996 changes to HECS were estimated to have reduced mature age applications by 10,000 persons or 7 per cent. It is important to emphasise in this latter case that the study only analysed the impact of the 1996 changes using applications data in the year that the changes were introduced (students applying to commence study in higher education in 1997). Thus the study concluded that it was too early to tell whether the change in the observed application rate was a permanent effect or a rescheduling of higher education plans. In addition, the study examined applications through admissions centres. Andrews suggested that the observed changes in applications through admissions centres may have been influenced by changes in the behaviour of direct applicants to universities (direct applications might be substituting for applications through admissions centres). In this event it would be difficult to disentangle the impact of changes to HECS with changes in the pattern of applications to universities.

Andrews also examined whether the 1996 changes to HECS impacted on subject choice. The a priori expectation being that demand would have been more subdued for courses in HECS Band 3, and also in HECS Band 2 over HECS Band 1. Once again the findings of this study must be treated with caution given its partial nature, using data for students applying to enrol in 1997 from only 20 out of 37 higher education institutions. Interestingly, Andrews found that there was no consistent pattern in changes in applications by HECS Band. That is, applications for some courses in HECS Band 1 went up (Education) while demand fell in other courses (Arts). Similarly, applications increased in HECS Band 3 relative to HECS Band 1, but this was not a statistically significant difference because of the variability in changes in applications across courses and institutions. Andrews concluded that there was 'little evidence of any systematic pattern in the changes in applications according to the HECS Band in which the discipline was placed' (Andrews, 1997, p. 17).

While the impact of HECS on overall demand for higher education is of concern, possibly of even greater interest is its potential impact on different groups in the student population given the stated rationale for HECS. That is, it is intended as an equitable means of student financing over other methods. A further study by Andrews (1999) examined patterns of enrolments among commencing students from different socio-economic status backgrounds to explore this issue. Unfortunately, it was not possible to ascertain the impact of the introduction of HECS on low SES individuals because of the lack of comparative data from earlier periods. However, the study was able to assess the effect of the introduction of differential HECS charges in 1997 on different groups. Andrews found no change in the share of students from low socio-economic status backgrounds in HECS Band 1 and that their share in HECS Band 2 decreased in 1997 but partially recovered the following year. The share of students from low socio-economic status

backgrounds in HECS Band 3 actually increased in 1997, but this was reversed the following year. Changes in the overall share of students from low socio-economic status backgrounds fluctuated within historical ranges between 1996 and 1998. Andrews concluded, therefore, that the introduction of differential HECS did not appear to have markedly changed the pattern of subject choice among students from different socio-economic status backgrounds. In any case, there is the complicating factor that changes in institutional admission policies towards students from low SES backgrounds may also have had some bearing on patterns of study within the three HECS Bands over this period.

Finally, Andrews (1999) reviewed the findings of a number of attitudinal surveys measuring individuals' views on HECS. The Higher Education Council commissioned a study in 1991 examining the impact of HECS on different groups. For school leavers, HECS was found to be a low ranking factor for those not deciding to go on to higher education and a middle ranking factor, behind academic factors and other economic factors, for those intending to undertake higher education. For adults, HECS was only a middle ranking factor regarding attitudes to undertake higher education. The Council concluded that 'most qualified applicants from across groups in the study would not be significantly deterred by HECS' (Andrews, 1999, p.12). A further study was conducted by Robertson in 1989 immediately after the introduction of HECS. This study concluded that HECS had little effect on the composition of applicants and no effect on the composition of those who accepted an offer. A study by Ramsay in 1998 of students entering the University of South Australia examined the specific issue of the impact of HECS on different groups in the student population. Comparing students from a low socio-economic status background with school leavers in general, the study found that HECS had no more of a negative impact on the decision to enrol of those from a disadvantaged background than on students in general. While attitudinal surveys can shed light on whether HECS has deterred interest in higher education, it is important to acknowledge that, in general, these types of surveys do have limitations in so far as actual behaviour may not necessarily accord with attitudes.

#### **IV Impact**

##### *Impact on disposable income*

To begin our appraisal of the HECS scheme we briefly describe the impact of HECS on disposable incomes. How does the repayment of HECS debts affect disposable incomes and what are the orders of magnitude involved? In particular, we explore the impact of the 1996 HECS changes focusing on the changes in repayment arrangements. The National Union of Students has suggested that the lowering of the income threshold had an adverse impact on mature age participation (NUS, 2001, p.77). First, the lower threshold meant that HECS was no longer a deferred fee for mature age students already in employment. Second, the lowering of the income threshold meant that many more mature age students, when faced with the prospect of combining study, part-time employment and HECS repayments, were unable to manage financially.

Our approach is straightforward. We first analyse the effect that the 1996 changes in the HECS regime have had on disposable income. We then consider the likely number of students affected, focusing on the impact of the lowering of the threshold. The 1996 changes in the HECS regime included:

- Introduction of differential bands, based on the cost of the course and expected earnings (as noted earlier, this also implied a significant increase in average HECS charges); and
- Changes in the thresholds determining rates of repayment. In particular, the threshold at which repayments began was reduced.

We also consider the impact of additional repayment bands introduced in 1996-97, though these were announced in 1995 and strictly speaking were not part of the 1996 HECS changes.

In order to assess the impact of the 1996 HECS changes on the disposable incomes of undergraduate students, we consider three factors :

- Whether the student receives Austudy benefit (since changed to the Youth Allowance);
- The taxation regime; and
- Repayments of HECS debt.

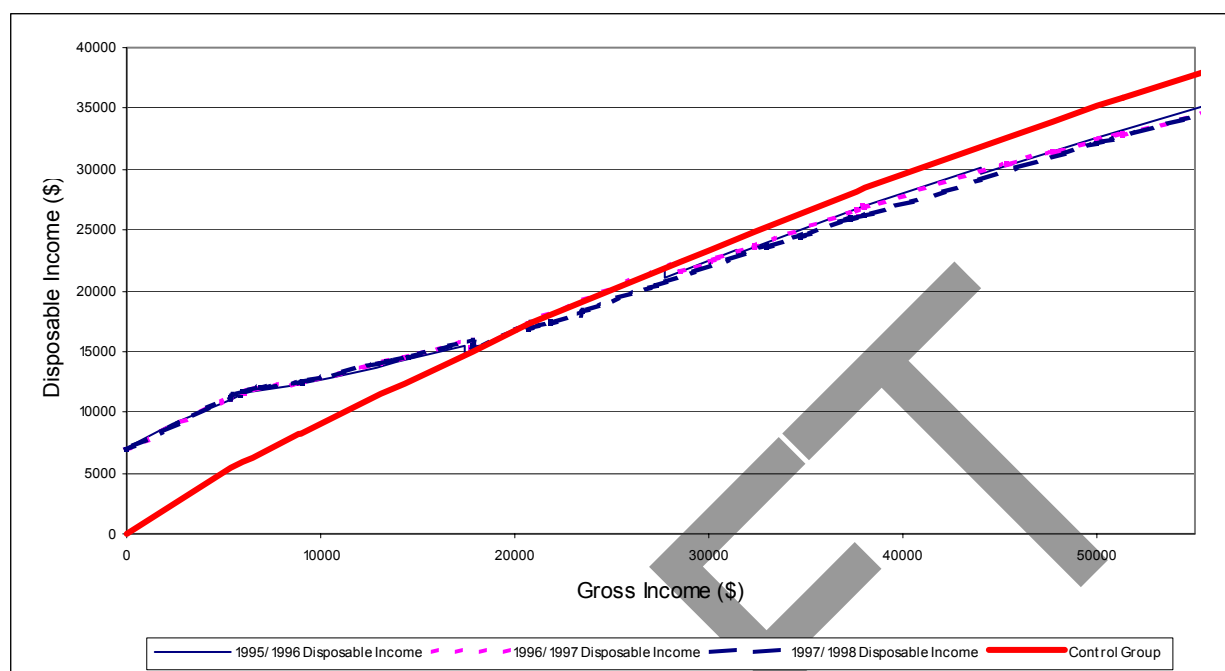
Figure 3 illustrates the relationship between gross income and disposable income. For purposes of comparison we show a control group demonstrating the relationship between gross and disposable income for a person not in receipt of Austudy benefit and without a HECS debt. Next we show the relationship between gross and disposable income for a person in receipt of Austudy benefit (the benefit is over and above gross income) and with a HECS debt under the pre-1996 HECS regime, shown by the line 1995-96 disposable income.

We note at the outset that payment of Austudy benefit phases out at around \$17,000, which is below the lowest income threshold for HECS repayments, either pre or post 1997. Comparing changes in disposable income between the control group and the HECS regime, as it applied in 1995-96, disposable incomes fell by around \$15 per week for persons with incomes of \$30,000 with a HECS debt. This increased to around \$30 per week for persons with incomes of \$40,000 and rising again to \$50 per week for persons with incomes of \$50,000.

In 1996-97, four new intermediate repayment thresholds were introduced with rates of 3.5 per cent, 4.5 per cent, 5.5 per cent and 6 per cent. The relationship between gross income and disposable income following these changes is shown in the line labelled 1996-97 disposable income. The sharpest effect on disposable incomes was experienced by persons with incomes of \$51,293 who had previously repaid HECS debts at the rate of 5 per cent but were now subject to a 6 per cent repayment rate. They experienced falls in disposable income equivalent to \$10 per week. In addition, those newly subjected to intermediate repayment rates of 3.5 per cent, 4.5 per cent and 5.5 per cent experienced falls in disposable income, though of a lesser magnitude.

In 1997-98, the minimum HECS repayment threshold was lowered from \$28,495 to \$20,701. Previously persons within this income range had not been required to make HECS repayments. The relationship between gross income and disposable income as a result of the lower repayment threshold is shown in the line labelled 1997-98 disposable income. With the lowering of the threshold, persons within the income range of between \$20,701 to \$28,495 were now required to make repayments of between 3 per cent and 4.5 per cent of pre-tax income and consequently experienced falls in disposable income of between \$12 and \$24 per week.

**Figure 3 : Impact of 1996 HECS Changes on Disposable Income**



To repeat, individuals in receipt of Austudy benefits (now Youth Allowance) were not affected by the HECS changes since Austudy benefits phase out at incomes of around \$17,000 which is below the lowest HECS repayment threshold of \$20,701 in 1997-98.

Data from the Australian Taxation Office (ATO) permit a partial assessment of reactions to changes in repayment rates and thresholds. Individuals are permitted by the ATO to defer repayment of their HECS debts in exceptional circumstances of serious hardship or other special reasons. Unfortunately, data on applications to defer repayment of HECS debt are not sufficiently reliable over time. However, the number of deferrals granted each year are available.

**Table 1 : Number of deferrals of HECS repayments granted**

<i>Assessment year</i>	<i>Number of deferrals granted</i>
1988-89	34
1989-90	67
1990-91	72
1991-92	72
1992-93	88
1993-94	400
1994-95	1392
1995-96	1188
1996-97	1237
1997-98	1489
1998-99	1215
1999-2000	979

Source : unpublished data, Australian Taxation Office

Data on deferment of HECS repayments granted does not suggest there has been any sustained increase in deferrals granted as a result of the 1996 HECS changes. The number of deferrals granted is broadly similar from 1994-95 onwards. There does appear to have been a sharper increase in deferrals granted in 1993-94 and again in 1994-95, prior to the 1996 HECS changes. The ATO advises that the large increase in deferment of HECS repayments in at this time may have been related to greater awareness of the ability to defer HECS repayments. To the extent that this is the case, then the number of deferrals granted is an imperfect measure of hardship imposed by HECS repayments

Having examined the likely changes in disposable income and reactions to the loss of disposable income, we then pose the question, how many students were likely to have been immediately affected by the lowering of the repayment threshold? Unfortunately data to answer this question are sparse. However, a survey of undergraduate student finances undertaken in 2000 (Long and Hayden, 2001) reveals information about the distribution of student income and employment patterns by various characteristics of students. While obviously this data refers to a period after the changes to HECS, it does serve to give some idea of the broad orders of magnitude of the number of students potentially affected by the changes.

**Table 2 : Distribution of student incomes, 2000, per cent**

Income	Full-time students	Part-time students	Total
Less than \$10,000	65	20	55
\$10,000 - \$19,999	28	19	26
\$20,000 - \$29,999	5	17	7
\$30,000 - \$39,999	1	18	5
\$40,000 or more	1	26	6
Total	100	100	100

Source : Long and Hayden (2001), Table 1.5, pp.21-22.

As can be seen from Table 2, a relatively small proportion of full-time students earn income in the range between \$20,000 - \$29,999 (in the 2000 survey year). According to this source, perhaps around 5 per cent of full-time students might have been directly affected by the lowering of the HECS income threshold from \$28,495 to \$20,701 in 1997-98. The same study reported that average hours worked by full-time students was 14.5 hours per week, so that their level of engagement in the labour market was generally quite low and most would not have been affected by the lower HECS repayment threshold.

The lowering of the HECS repayment threshold is more likely to have had a direct effect on part-time students. Long and Hayden (2001) found that around 17 per cent of part-time students earned incomes of between \$20,000 to \$29,999 in 2000, though this still represents a minority, less than one in six, of all part-time students. Understandably, part-time students engagement in the labour market is more extensive than their full-time counterparts, working on average 32 hours per week and with 54 per cent engaged in full-time employment. Our analysis of trends in participation rates among different groups of commencing students, described later in the paper, shows that part-time and external students were more affected by the 1996 HECS changes.

### *Impact on demand for higher education*

In examining the impact of HECS on the demand for education we essentially revisit the earlier analysis undertaken by Andrews (1997) but with the added advantage of an additional four years of data. The earlier study by Andrews was a preliminary investigation observing the impact of the 1996 changes to HECS on applications to study in higher education in 1997. We observe the pattern of applications to study in higher education up to and including the 2001 academic year. This provides scope for a more definitive assessment of the more recent changes in the HECS regime.

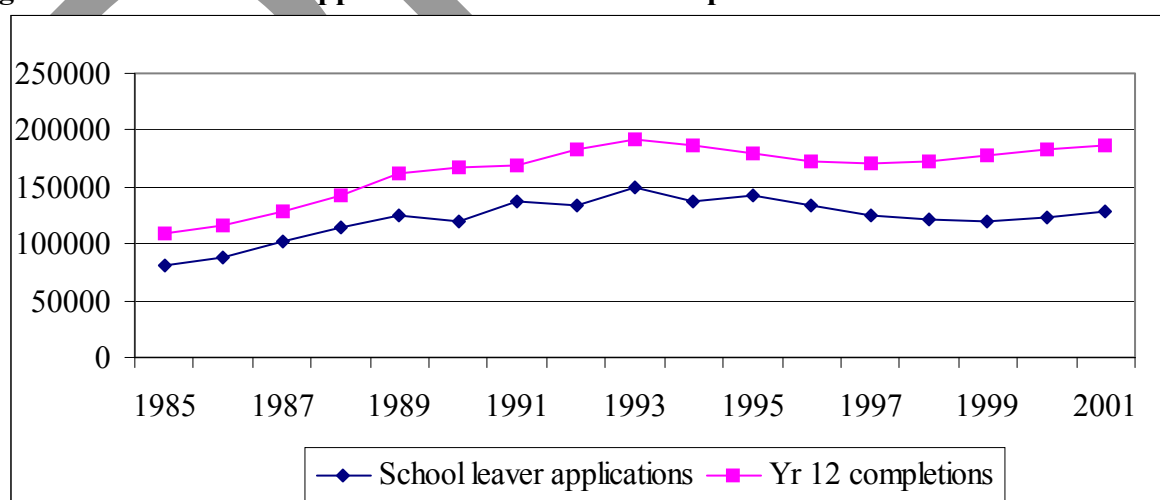
We examine trends in the demand for higher education among two groups in the population defined according to their schooling status on application<sup>4</sup>. School leaver applicants are defined as persons who completed Year 12 in one of the two years prior to applying for university entrance. University applications are counted in April of the academic year, so school leaver applicants are defined as persons who have completed their final year of study in the previous year or the year before that. We refer to the remainder as 'mature age' applicants. However, note that applicants amongst this residual group need not necessarily meet the requirements for university entrance under the mature age entry schemes nor are they necessarily older than the school leaver group.

Unlike the earlier Andrews study, we model directly the number or level of applications for university in each year. This formulation is preferred on the grounds that it is simpler and possibly more intuitively understood than modelling the application rate.

#### School leaver applications

The a priori expectation is that the number of school leavers applying for admission to university is related to the number of persons completing Year 12. Figure 4 shows the relationship between Year 12 completions and university applications. The latter are measured in April of the year of commencing higher education study. Hence the data shown in Figure 4, for example in 2001, university applications in 2001 and the number of Year 12 completions in the previous year.

**Figure 4 : School leaver applications and Year 12 completions**



Sources : Australian Vice-Chancellors' Committee unpublished data, ABS, Schools, 4221.0

<sup>4</sup> Our analysis is restricted to persons applying to enter university through State Admission Centres. Persons applying for entry directly to universities are not included in the analysis since data on such persons are not readily available.

A sizable but variable number of school leaver applications are sourced from students who completed Year 12 two years before they apply. We included in the model the number of students who completed Year 12 two years prior to application<sup>5</sup>.

There are a number of other possible factors that might influence a school leaver's decision to apply for university admission. The state of the labour market is likely to be a factor, with higher (or rising) unemployment encouraging more students completing Year 12 to apply for university admission since higher unemployment decreases the opportunity costs of further study. Our modelling assumes that there is an underlying level of applications from persons completing Year 12 but with changes in the state of the labour market shifting up or down the number of applications from Year 12 completions<sup>6</sup>.

Expected financial returns from acquiring post-school qualifications compared to those available from joining the workforce straight from school may also influence school leavers' decisions to apply for university. We use the ratio of graduate starting salaries to average weekly earnings as a measure of the expected financial returns from higher education. We also examine whether there are peer group or cohort effects in operation. That is, Year 12 completers might be encouraged to apply if they observe more of their peers applying in the previous year. We included a lagged dependent variable to measure this effect. Increasing HECS charges, all other things being equal, would be expected to lower the demand for higher education.

Alternative models were tested in an attempt to measure the influence of each of the factors described above. Our preferred model is shown below :

$$\text{Year 12 applications} = B_0 + B_1 * (\text{Year 12 completions}) + B_2 * (\text{Year 12 completions} * \text{Full-time teenage unemployment rate}) + B_3 * (\text{1989 effects}) + B_4 * (\text{1997 effects})$$

As expected, Year 12 completions from the preceding year were a significant factor in determining university applications.

We find that changes in labour market conditions do have the expected effect. That is, an increase in the 15-19 teenage full-time unemployment rate raises the number of Year 12 completers applying for university and vice-versa. However, this effect was found to be small and insignificant – a one percentage point increase in the 15-19 teenage full-time unemployment rate is estimated to lead to an additional 80 applications (out of a total of approximately 100,000 school leaver applications). Note that this measures only the direct effect of labour market conditions on the number of Year 12 completers applying for university. In addition, changes in labour market conditions indirectly affect applications through influencing the Year 12 retention rate and thereby the number of Year 12 completions.

We found no evidence to suggest that the level of school leaver applications was significantly influenced by peer group effects or changes in relative graduate starting salaries<sup>7</sup>.

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<sup>5</sup> A separate variable showing the number of students completing Year 12 in the two years prior to application was not found to be a significant influence on the level of school leaver applications. A weighted average of Year 12 completions in the year before and two years before, measured as a single variable, was also insignificant.

<sup>6</sup> That is, we interact Year 12 completions with the state of the labour market. A number of alternative measures of the state of the labour market were included in the analysis, but none were found to be significant.

<sup>7</sup> It is worth observing at this point that we have few degrees of freedom and therefore it is difficult to discern any but the most obvious factors influencing school leaver applications.

The inclusion of 1989 effects and 1997 effects ‘dummy variables’ is an attempt to capture the effect of significant (and permanent) changes to conditions commencing in 1989 and 1997 respectively that might influence university applications. However, dummy variables have a number of inherent weaknesses, some of which are detailed below, using the 1989 dummy variable as an example.

The introduction of HECS in 1989 was a real and permanent change to the higher education system, but was its effect constant over time and would it still influence student decisions now ? It is possible that the introduction of HECS would have had a greater effect on potential university applicants in the early years following 1989, due to students having to factor in their own contributions, rather than in the current period where HECS has been a fact of life for all of their schooling. In the absence of other data the dummy variable methodology cannot replicate a gradual reduction in the ‘intensity’ of its effects in any meaningful way.

In summary, the introduction of HECS in 1989 is one among many possible factors that may have influenced application numbers. These factors are all subsumed into the 1989 effects ‘dummy variable’ and cannot be separately identified.

Our preferred model suggests that the 1997 effects variable, attempting to capture the impact of the 1996 changes in the higher education system (implemented from 1997 onwards), was significant and indicated that approximately 9,000 fewer school leavers a year applied for university from 1997 onwards. The 1997 effects variable coincides with the introduction of higher and ‘differential rates’ of HECS, changes in repayment rates and repayment thresholds. However, noting the comments above, it may also incorporate other, as yet unspecified influences. Table 3 shows the regression results for the chosen model. We find no evidence that the introduction of HECS in 1989 had a negative influence on school leaver applications. Rather, other unspecified factors acting at the time appear to have had the effect of increasing school leaver applications by around 1,300 persons, though it must be emphasised the 1989 effects variable did not add significantly to the regression model.

These findings contrast with those of the earlier Andrews (1997) study that found the changes in 1989 (including the introduction of HECS) had lowered school leaver applications by around 20,000 persons but the 1996 changes had had no significant impact. One reason that might underly the different findings between this study and the earlier Andrews study is that the model specification is different in each case. This study estimates the *level* of school leaver applications whereas the Andrews estimated the *rate* of school leaver applications. Another reason is the longer time frame used to evaluate the impact of the 1996 HECS changes in this study. Given the divergence between the earlier findings by Andrews and those of the present paper, this does suggest the need for some caution in interpreting the influence of HECS on the demand for higher education among school leavers.

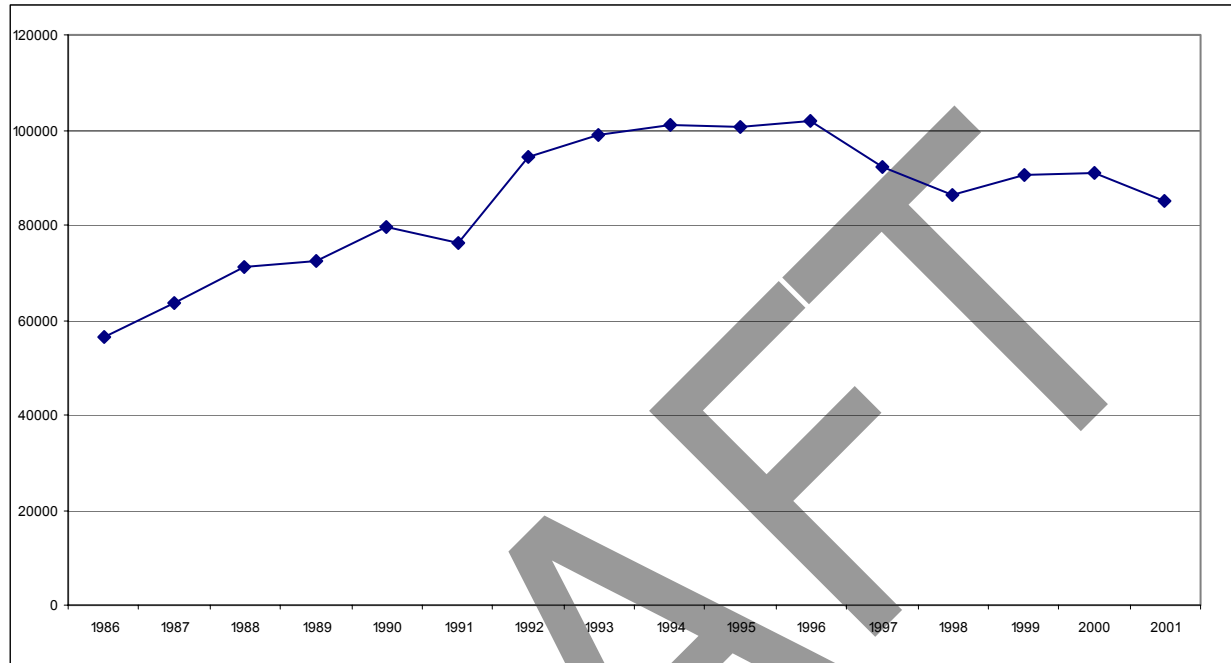
**Table 3 : Regression results for school leaver applications**

Variable	Coefficient	Standard Error	t value
Intercept	14387	20837	0.69
Year 12 completions	.6168	0.1926	3.20#
Year 12 completions*	.0080	.0084	0.95
15-19 full-time unemployment rate			
1989 effects	1319	8969	0.15
1997 effects	-9126	4192	-2.18#
# significant at 95% level			
Regression statistics R-square .9043 Adjusted R-square .8695 Durbin-Watson 2.737			

## Mature age applications

Figure 5 shows the path of 'mature age' applications for university entrance over time.

**Figure 5 : 'Mature age' university applications by year**



Source : Australian Vice-Chancellors' Committee, unpublished data.

A priori, the level of 'mature age' applications might be expected to increase in line with the size of the mature age population (we include the 25-44 year-old population as an explanatory variable in our model). As before, changes in labour market conditions, as measured by the overall unemployment rate, might be expected to lead to more persons among the mature age population applying to enter university. There also appears to be a general upward trend in 'mature age' applications, as shown in Figure 5, which could be driven by a number of factors such as increasing tastes for education, 'cohort effects' and the like. Finally, we test whether changes introduced in the higher education system in 1989 and 1996 (noting once again these were implemented in 1997) influenced the level of mature age applications.

Our preferred model is shown below :

$$\text{Mature age applications} = B_0 + B_1 * (\text{Trend}) + B_2 * (\text{Unemployment rate}) + B_3 * (\text{1989 effects}) + B_4 * (\text{1997 effects})$$

Our earlier analysis of school leaver applications showed that the size of the feeder group of Year 12 completions was a significant influence on the demand for education. Our analysis of 'mature age' applications contrasts with this earlier finding in that we find there is no significant influence of the size of the feeder group of mature age persons, variously measured, on demand for higher education. We find that the size of the mature age population (25-44 years) is not a significant factor influencing the level of mature age university applications. Several alternative specifications of the population variable were tested including weighted variables incorporating data on the age structure of university applicants but none of these were found to be statistically

significant. The fact that the number of ‘mature age’ applications represents only about one per cent of the 25-44 year-old population which might explain why there is no strong link.

**Table 4 : Regression results for ‘Mature Age’ university applications**

Variable	Coefficient	Standard Error	t Value
Intercept	30478	6914	4.41#
Adult unemployment rate	3545	874	4.06#
Trend	2867	611	4.69#
1989 Effects	9464	4324	2.19#
1997 Effects	-16882	4935	-3.42#

# significant at 95% level

#### Regression statistics

R-square .9330

Adjusted R-square .9086

Durbin-Watson 2.504

In the absence of any significant influence from changes in the size of the population, we examined whether the overall unemployment rate independently influenced the level of mature age applications. We find that a one percentage point increase in the unemployment rate raises the level of mature age applications by around 3,500 persons.

We found no evidence of a significant cohort effect influencing the level of mature age applications (as measured by a lagged dependent variable). Rather, the preferred model suggests that the level of mature age applications is increasing by around 2,900 persons each year due to factors unspecified (as measured by a time trend).

We find that the 1996 changes to the higher education system had a significant negative influence on the demand for higher education among mature age person. However, we find no evidence to support the proposition that the introduction of HECS in 1989 adversely impacted on the level of mature age applications. We repeat our earlier caveat that the 1989 and 1997 effects dummy variables are capturing all factors that may have influenced mature age applications in each period. Therefore we cannot readily conclude that changes in the demand for higher education among mature age persons can be attributed to changes in HECS arrangements alone.

The coefficient of the 1997 effects variable shows that nearly 17,000 fewer mature age applications were lodged each year from 1997 onwards. Again, we compare our findings with those of the earlier Andrews (1997) study which suggested that the 1996 changes had had the effect of reducing mature age applications by around 10,000 persons each year.<sup>8</sup>

The coefficient of the 1989 effects variable suggests that approximately 9,500 more mature age applications were received each year from 1989 onwards. Thus, the evidence is not consistent

<sup>8</sup> Andrews (1997) suggested that the finding that the 1996 changes to HECS had dampened demand for higher education among mature age applicants may have been confounded by changes in applications procedures. However, subsequent research by Li et al. (2000) suggests that applications through admissions centres are a reasonable proxy for the pattern of student demand.

with the view that the introduction of HECS in 1989 dampened demand for higher education among mature age persons. Rather, other factors coinciding with the 1989 changes must have acted to encourage demand for higher education among mature age persons. For example, the increased availability of places might be one reason why mature age persons were encouraged to apply for university. However, we have to acknowledge our modelling is relatively imprecise so that it is difficult to accurately identify the factors accounting for increasing demand. These findings are consistent with the earlier Andrews (1997) study in the sense that the introduction of HECS in 1989 was not found to have had a negative impact on demand for higher education among mature age persons.

In summary, the findings of this study and the earlier Andrews study are consistent with the view that the 1996 changes to HECS have dampened the demand for higher education among mature age applicants. Our results do not support the proposition that the introduction of HECS in 1989 had an adverse impact on mature age applicants. Rather, if there were any negative price effects, then these were clearly outweighed by the effect of the general expansion of higher education places.

### *Impact on different groups*

In the previous section, we examined the influence of HECS on the higher education system at the aggregate level. We now conduct a more disaggregated analysis, examining changes in the pattern of commencing students to assess whether the 1996 HECS changes had a different impact on different groups within the student population.

We draw on the concept of *elasticity of demand* to predict possible changes in behaviour in response to the 1996 HECS changes. The *elasticity of demand* is a measure of responsiveness of consumer demand to changes in price. It takes into account a number of factors including personal preferences. The greater the *elasticity of demand* of a good the greater the effect on the quantity consumed for any given price change. For example, goods which are necessities are price inelastic because the quantity consumed does not vary greatly as price increases or decreases, while the consumption of luxuries is very sensitive to price changes and highly elastic. If the *elasticity of demand* varies across different groups in the population, then the impact of the 1996 HECS changes is likely to vary accordingly across different groups.

The relationship between changes in prices, student demand and enrolments is not clear cut. The Commonwealth government essentially constrains the overall number of places or enrolments through budget decisions. Therefore there is no direct relationship between student places and student demand. If different groups have a different elasticity of demand for higher education, then for a given price change, groups will respond in different fashion. As higher education institutions adjust to changes in the demand for higher education from different groups, then we would expect this to be reflected to some degree in changes in the pattern of enrolments of different groups. In this sense there will be an indirect relationship between price changes and enrolments. Therefore we look at the relative outcomes of different groups by examining changes in the pattern of enrolments of commencing students as a percentage of the relevant population, that is, commencing participation rates.

As a starting point, different age groups are likely to respond in a different manner to changes in the costs and benefits of higher education. Obviously the older the individual, the shorter the flow of expected benefits and the lower the net value of higher education. This simplified view would suggest that the elasticity of demand increases as age increases and that the 1996 HECS changes are likely to have had a greater impact on older age groups.

Second, the 1996 HECS changes might be expected to have a different impact on persons with different levels of prior experience in higher education. Persons contemplating starting an award after 1996 fell into three categories of previous higher education experience. These categories were: a prior incomplete award; a prior completed award; and no previous university experience new to higher education. The elasticity of demand is likely to be different for each of these groups.

Persons with a prior incomplete or complete award are probably more likely to gain credit for earlier study, will study for a shorter period and incur a lower HECS debt. Also, given these persons have undertaken previous study, they may have developed a taste for further study. On the other hand, persons without prior experience of higher education probably face the highest expected debt and uncertainty about expected outcomes. For these reasons, it is predicted that persons without prior experience and are new to higher education will have a higher elasticity of demand and are more likely to be discouraged from attending university.

Third, the impact of the 1996 HECS changes might be expected to vary by mode of study. Full-time students, on average, take less time to complete their studies and would have a longer time, all other things being equal, to recoup the costs of higher education. Part-time and external students, on the other hand, are likely to have a more marginal attachment to studying (Urban et al, 1999) which means that their demand for education is likely to be more elastic and they are more likely to be responsive to changes in the costs of education.

This speculation leads to the view that the increased cost of attending university due to the 1996 HECS changes would lead to fewer older people participating in higher education. In particular, it would affect those wanting to study part-time or externally and those new to higher education. It is important to acknowledge at the outset that there may be an interaction between these factors. That is, for example, older students are also more likely to study part-time. Therefore, a partial analysis of the influence of age may be confounded by the influence of mode of study. In this situation it becomes difficult to isolate the independent effect of age over and above other factors. While this does limit the value of any partial analysis of the influence of age, prior experience or mode of study, we nonetheless adopt this approach to demonstrate in some approximate sense, how sensitive different groups are to changes in price.

#### Changes in participation by age group

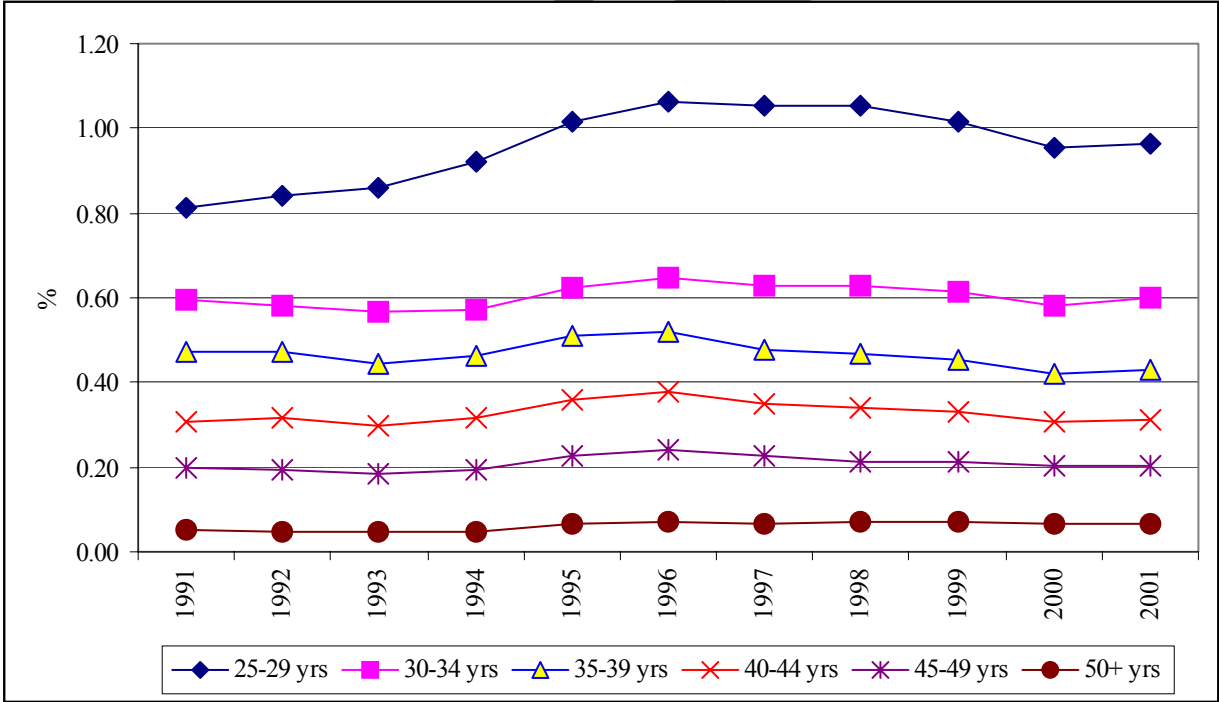
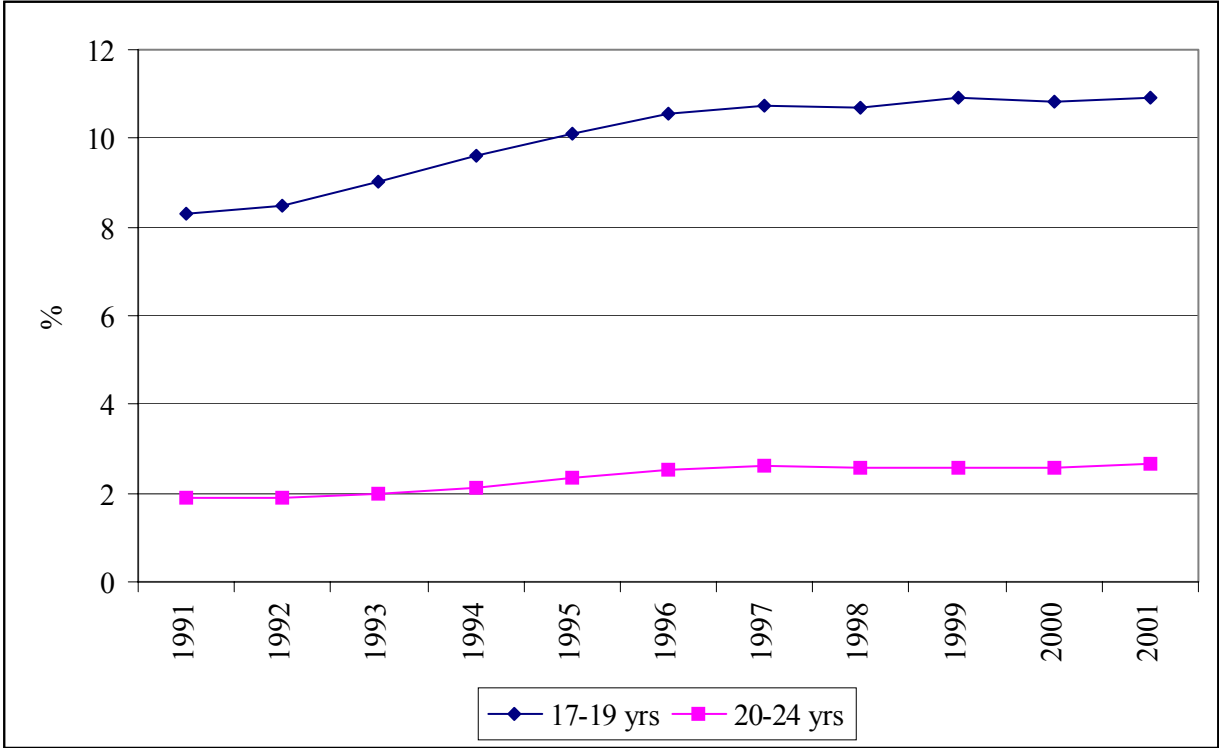
We begin by examining age participation rates in commencing Bachelor level courses<sup>9</sup>. It is readily apparent that participation rates among older age groups have fallen coinciding with the 1996 HECS changes. Examination of Figure 6 shows that participation of persons 25 years-old and over peaked in 1996 and fell thereafter. For example, the participation rate of 40-44 year-olds peaked at 0.38 per cent in 1996 and then steadily declined to 0.31 per cent by 2001.

It is difficult to discern the precise effect that the 1996 HECS changes may have played in explaining trends in participation among older age groups since there are a number of other confounding factors. First, the overall level of higher education places is constrained by

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<sup>9</sup> That is we examine the number of non-overseas students commencing study in Bachelor's Graduate Entry, Bachelor's Honours and Bachelor's Pass students expressed as a proportion of the relevant age group. For example, the 17-19 year-old category shown in Figures 6, 7 and 8 includes all students aged less than 20 divided by the 17-19 year-old population. Likewise the participation rate of 50-64 year-olds represents all students aged 50 and over divided by the 50-64 year-old population.

**Figure 6 : Participation rates of commencing Bachelor level students by age group**



Source: DEST, Higher Education Statistics Collection

government funding levels. Second, with a steady improvement in unemployment over the latter part of the 1990s, older persons may have been more attracted to participation in the labour market over higher education, given the shorter period over which they can recoup the benefits of a higher education.

In this section we model changes in shares of commencements in an attempt to try and discern the impact of the 1996 HECS changes on different age groups<sup>10</sup>. This is different from modelling overall demand or participation rates because the overall number of commencements is constrained, primarily by the number of government funded HECS places.

Denote by  $X_i^*$  the demand for places by the  $i^{th}$  age group.

We posit  $X_i^* = \alpha_i P_i U^{B_i}$  where  $P_i$  is the population of the  $i^{th}$  age group and  $U$  are some environmental variables.

We assume places  $X$  are allocated proportional to demand.

$$\text{Then } X_i = \frac{\alpha_i P_i U^{B_i}}{\sum_j \alpha_j P_j U^{B_j}} \cdot X$$

$$\text{or } \frac{X_i}{X} = \frac{\alpha_i P_i U^{B_i}}{\sum_j \alpha_j P_j U^{B_j}}$$

We take percentage changes to see what happens if  $P_i$  or  $U$  changes.

$$\begin{aligned} \text{Then } \% \Delta \frac{X_i}{X} &= \% \Delta P_i + B_i \% \Delta U - \% \Delta \sum_j \alpha_j P_j U^{B_j} \\ &= \% \Delta P_i + B_i \% \Delta U - \sum_j \frac{X_j}{X} [\% \Delta P_j + B_j \% \Delta U] \\ &= \% \Delta P_i - \sum_j \frac{X_j}{X} \% \Delta P_j + \% \Delta U \left[ B_i - \sum_j \frac{X_j B_j}{X} \right] \end{aligned}$$

Now if  $\% \Delta P_i = \% \Delta P_j \forall i, j$  then the first and second terms cancel. Similarly, the third and fourth terms cancel if  $B_i = B_j \forall i, j$ .

If this is not the case we see that  $\% \Delta P_i$  is dampened by changes in other groups, weighted by their importance. So it makes little difference if the older age groups change population size. Similarly, changes in shares of commencements in response to environmental changes depend on the differences between a group's elasticity and the overall weighted elasticity.

<sup>10</sup> Specifically, we examine each age group's share of total non-overseas Bachelor level commencements.

We conduct the following regression.

We calculate  $\% \Delta \frac{X_i}{X} - \% \Delta P_i + \sum_j \frac{X_j}{X} \% \Delta P_j$  as the dependent variable.

We regress the dependent variable on percentage changes in environmental variables, which in this study include the aggregate unemployment rate and a dummy variable representing the changes in HECS arrangements introduced in 1997<sup>11</sup>. The regression coefficients then give the differential elasticities of change in demand.

Overall, it does appear that labour market conditions and the 1996 HECS changes influenced changes in shares of commencing students among different age groups.

**Table 5 : Regression results for changes in shares of commencing Bachelor level students**

Age group	Unemployment rate (t value)	1996 HECS changes (t-value)
17-19	<b>.045</b> (1.49)	<b>1.274</b> (0.93)
20-24	<b>-0.068*</b> (-1.88)	<b>2.219</b> (1.36)
25-29	<b>0.058</b> (1.12)	<b>-1.513</b> (-0.65)
30-34	<b>-0.097</b> (-1.28)	<b>-2.773</b> (-0.81)
35-39	<b>-0.045</b> (-0.46)	<b>-8.358*</b> (-1.86)
40-44	<b>-0.044</b> (-0.41)	<b>-8.706</b> (-1.81)
45-49	<b>-0.133</b> (-1.27)	<b>-4.863</b> (-1.02)
50-64	<b>-0.279</b> (-1.67)	<b>-4.813</b> (-0.63)

\* significant at the 95 per cent level or better

We find that age groups' share of commencements do appear to respond to changes in labour market conditions.<sup>12</sup> Though many of the coefficients of the unemployment rate variable for the individual age groups are not statistically significant, as shown in Table 5, nevertheless the pattern of results suggests that older workers' share of commencing students falls as the unemployment rate deteriorates. Conversely, younger persons tend to struggle to gain a foothold in the labour market as unemployment rises and they increasingly dominate entry to enter higher education as an alternative pathway. This is consistent with 17-19 year-olds and 25-29 year-olds

<sup>11</sup> Given we are modelling percentage changes, the HECS dummy variable takes a value of 1 in 1997 and 0 otherwise. That is, we examine whether there is a once and for all change in shares of commencements as a result of the 1996 HECS changes.

<sup>12</sup> We tested the null hypothesis that labour market conditions have no overall effect on age groups' share of commencing students. Using a Seemingly Unrelated Regression (SURE) approach with the 45-49 year-old age group omitted, we find  $p=0.0000$  and therefore we reject the null hypothesis that the unemployment rate has no effect on age groups' share of commencing students.

share of commencements increasing as unemployment increases, though the results for these age groups presented in Table 5 are not statistically significant. The finding that 20-24 year-olds share of commencements falls in response to rising unemployment is not consistent with this hypothesis and is a little difficult to explain.

The 1996 HECS changes do appear to have influenced age groups' share of commencements. We reject the null hypothesis that the 1996 HECS changes had no effect on age groups' share of commencements.<sup>13</sup> In addition, there appears to be a distinct pattern in age groups' response to the HECS changes. The older age groups' share of commencements fell as shown by the coefficients on the HECS variable in Table 5. Also, the magnitude of falls was larger among the oldest age groups. While it is difficult to place too much reliance on the results for individual age groups, given most of the HECS coefficients are not significant, nevertheless the aggregate results and the distinct pattern in the results for individual age groups suggests that the 1996 HECS changes do appear to have influenced age groups' share of commencements. In particular, older persons have a higher elasticity of demand for education and appear to have been more affected by the 1996 HECS changes.

Our analysis above suggests that older persons may have been more responsive to the 1996 HECS changes. In the following sections we review whether the 1996 HECS changes had a differential impact on other characteristics of students. For example, does HECS have a differential effect on students with previous education experience or on students choosing different modes of study ?

#### Changes in participation by prior education experience

In this section we review patterns of participation among commencing students by age and prior higher education experience. The pattern of commencements among older students new to higher education group changed noticeably after 1996 as shown by Figure 7. For example, following the 1996 HECS changes, the participation rate of 25-29 year-old commencing students declined from 0.49 per cent in 1996 to 0.39 per cent in 2001. Similarly, the participation rate of 40-44 year-olds declined from 0.18 per cent to 0.13 per cent over the same period. Had the 1996 participation rate of these groups prevailed in 2001, there would have been an additional 1,500 and 600 persons new to higher education respectively. The evidence of the impact on the 1996 HECS changes on persons with a prior complete award or an incomplete previous award is less clear cut. Among the latter group, there is no readily discernible fall in participation. Among persons with a prior complete award there is evidence of declining participation rates among middle age persons. However, closer inspection shows that participation rates of 35-49 year-olds peaked in 1995 and actually began falling in 1996 prior to the 1996 HECS changes.

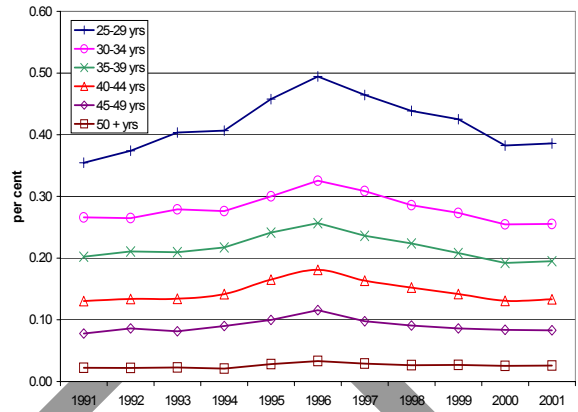
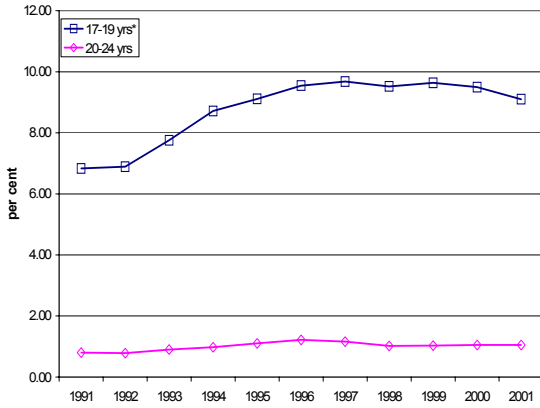
Overall, the conclusion must be that older persons new to higher education have relatively high elasticity and older persons with a previous complete award or previous incomplete award have lower elasticity. In other words, persons with no previous higher education experience, as predicted, responded most to the 1996 HECS changes with there being a less noticeable impact on other groups.

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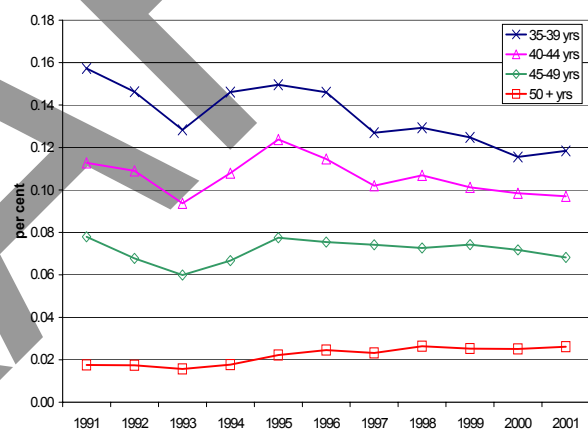
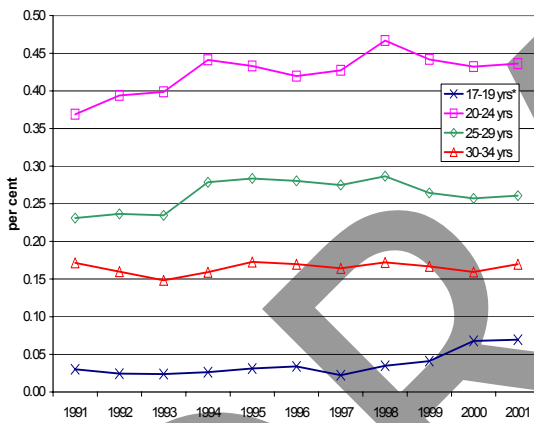
<sup>13</sup> As above, we tested the null hypothesis that the 1996 HECS changes had no overall impact on age groups' share of commencing students using a SURE approach. Since  $p=0.0014$  we reject the null hypothesis that HECS has no effect on shares of commencements.

**Figure 7 : Participation rates of commencing Bachelor level students by age group and prior education status**

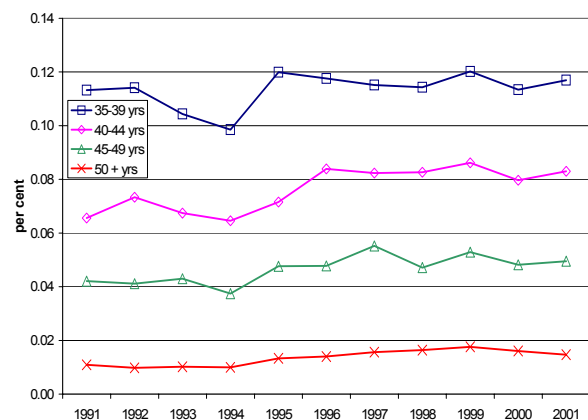
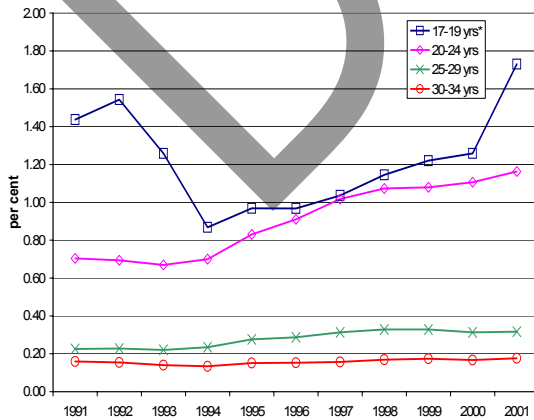
New to higher education



Completed higher education



Incomplete higher education



Source: DEST, Higher Education Statistics Collection

## Changes in participation by mode of study

In this section we review patterns of participation among commencing Bachelor level students by age and mode of study. Beginning with full-time students, there are no apparent declines in participation among any age groups post the 1996 HECS changes as shown by Figure 8. That said, the rate of growth of participation among younger students aged 17-24 years-old does appear to have plateaued after 1996.

Examination of Figure 8 shows that participation rates among older part-time and external students aged 25 years and over fell noticeably after 1996 following the HECS changes. In particular, the declines were more marked among part-time than external students. For example, the participation rate of 25-29 year-olds commencing part-time declined from 0.34 per cent in 1996 to 0.25 per cent in 2000.<sup>14</sup> Once again, to demonstrate the orders of magnitude involved, had the 1996 participation rate prevailed, then there would have been an additional 1,200 25-29 year-olds commencing part-time study in 2000. By way of example, the participation rate of 35-39 year-olds studying externally fell from 0.17 per cent in 1996 to 0.14 per cent in 2000. Had the 1996 participation rate prevailed in 2000, there would have been an additional 500 35-39 year-olds commencing higher education externally. Overall, it would appear reasonable to conclude that older part-time and external students were more responsive to the 1996 HECS changes than were older full-time students.

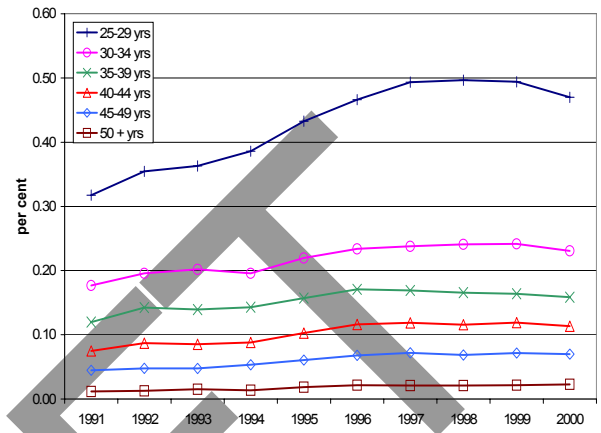
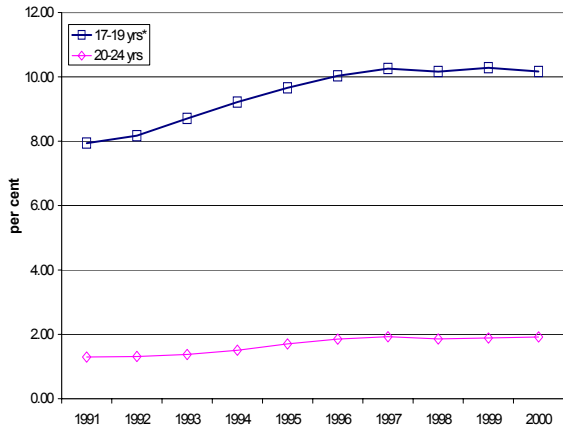
In summary, changes in the pattern of commencing students after 1996 are consistent with expectations of the likely elasticity of demand across various groups. In response to a real average increase in HECS charges of 65 per cent, it appears there has been a relatively muted response from young people. Older age groups appear more responsive to changes in HECS. In particular, older persons new to higher education or studying part-time or externally appear to be more sensitive to HECS changes than their counterparts. At this point, it is worth reiterating once again that these are only approximate partial effects of the response to the 1996 HECS changes. For example, it would be mistaken to simply add these partial effects and conclude that this was the sum total of responses to the 1996 HECS changes. Rather, the purpose here has been to demonstrate those groups most likely to be sensitive to changes in the HECS regime and to give an approximate sense of the relative orders of magnitude of those changes.

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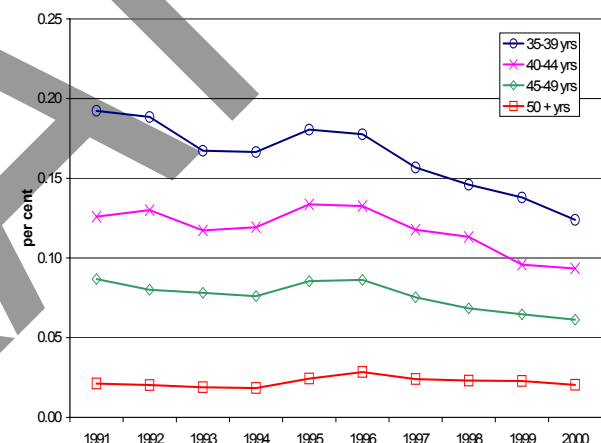
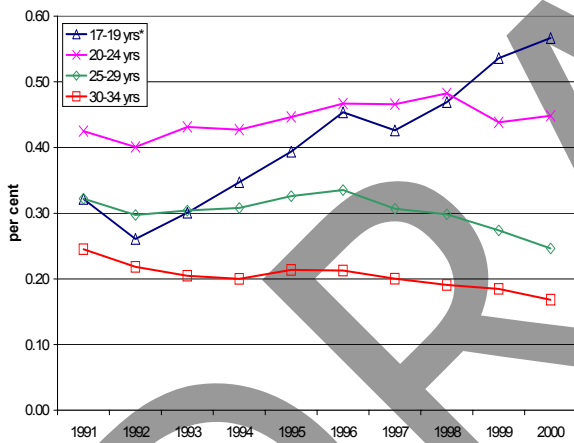
<sup>14</sup> Data for 2001 are not shown due to changes in the classification of mode of study.

**Figure 8 : Participation rates of commencing Bachelor level students by age group and mode of study status**

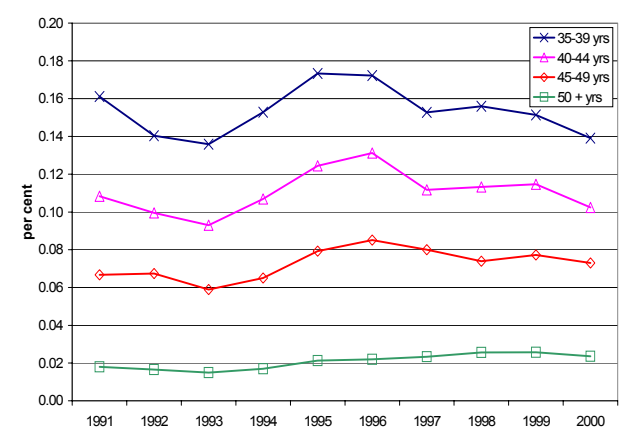
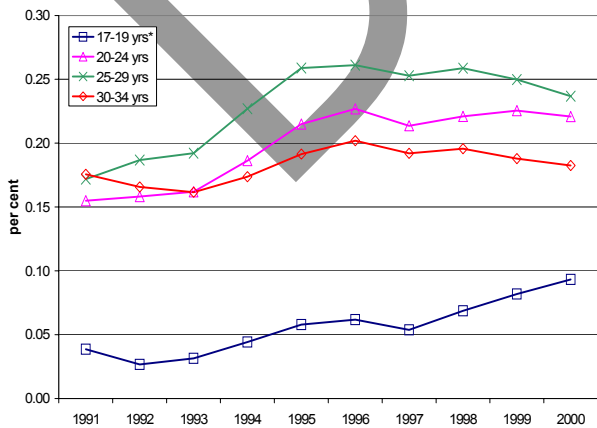
Full-time



Part-time



External



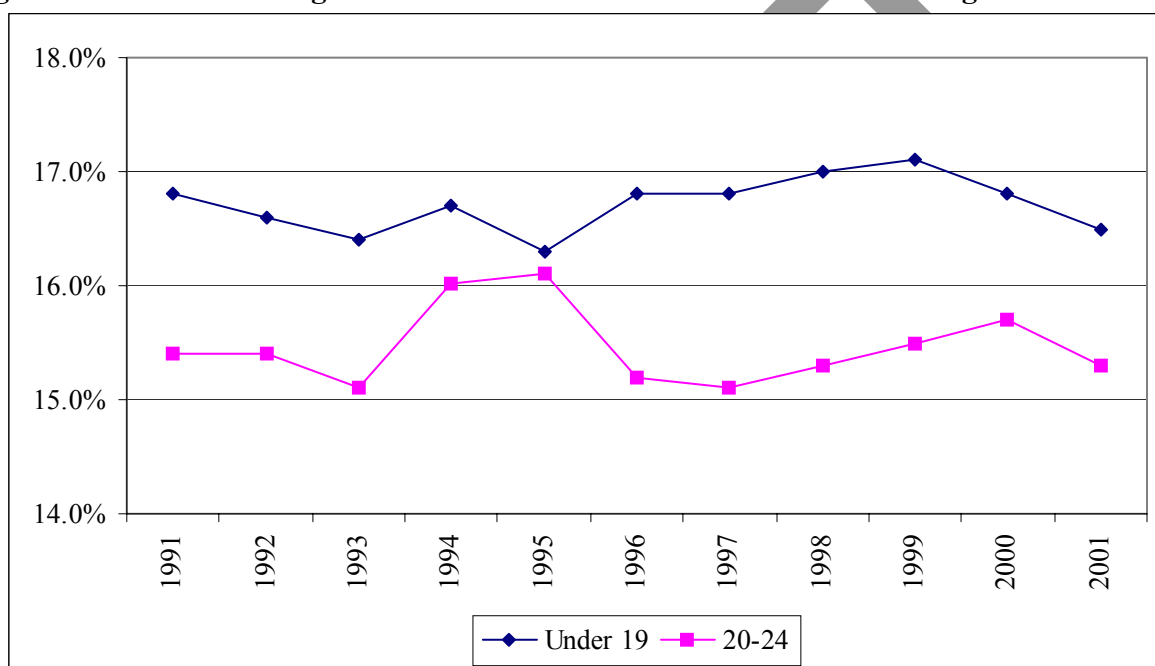
Source: DEST Higher Education Statistics Collection

### *Impact on socio-economic status groups*

Following on from the earlier Andrews (1999) study, we examine patterns of commencing students among socio economic status (SES) groups to discern whether the 1996 HECS changes adversely affected persons from more disadvantaged backgrounds<sup>15</sup>. This study has the advantage of a longer run of data and also analyses trends at a more disaggregated level.

The share of commencing students from a low SES background has fluctuated over the decade as shown by Figure 9. It is not apparent that the 1996 HECS changes have had an adverse impact on the share of commencing students from a low SES background<sup>16</sup>.

**Figure 9 : Share of undergraduate commencements from a low SES background**



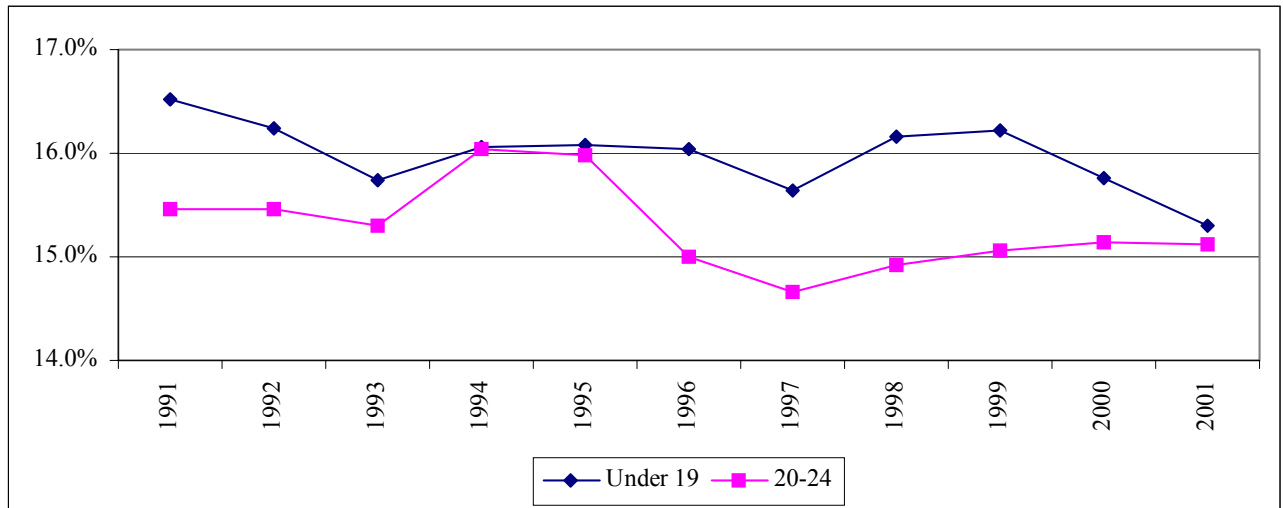
Source: DEST, Higher Education Statistics Collection

There have been changes in access among certain sub-groups of low SES students over the last decade, most noticeably among males. The share of male low SES 20-24 years-old commencing students has declined in recent years, but this decline predates the 1996 HECS changes as shown by Figure 10. The share of male low SES students under 19 years-old commencing higher education decreased slightly in 1997, though recovering in 1998 and 1999, before falling again in 2000 and 2001. Thus it is not readily obvious that the 1996 HECS changes have adversely affected males from a low SES background either.

<sup>15</sup> Students SES status is determined according to their home postcode and the education and occupation structure of households within each postcode. Students from a low SES background are drawn from postcodes that form the lowest socio-economic quartile of the population.

<sup>16</sup> We examine persons from a low SES background from the Under 19 and 20-24 year-old age groups since we are interested in the issue of intergenerational mobility. Accordingly, all references and figures relating to undergraduate commencements in this section actually refer to the subset of the student population aged 24 years-old or under.

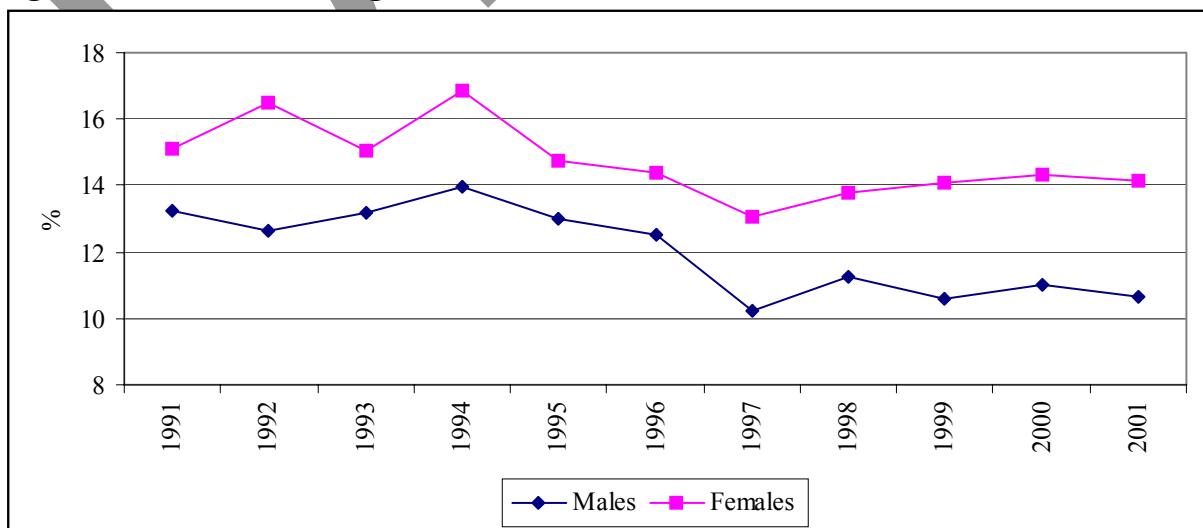
**Figure 10 : Share of male undergraduate commencements from a low SES background**



Source: DEST, Higher Education Statistics Collection

Finally, we observe whether the introduction of differential HECS has had an impact on subject choice among persons from a low SES background by examining the pattern of commencing students in HECS Band 3 courses, the most expensive courses. There has been an appreciable fall, 22 per cent, in the share of HECS Band 3 students among commencing students (non-overseas undergraduates aged under 24 years-old) between 2001 and 1996. This appears to have affected males more than females. Figure 11 shows that the share of male students in HECS Band 3 from a low SES background has fallen by 15 per cent between 1996 and 2001. Over the same period, there has been relatively little change among females. This is in response to charges for HECS Band 3 increasing by 122 per cent in real terms in 1997. Thus, patterns of commencing students are consistent with the 1996 HECS changes having had some impact on subject choice among males from a low SES background. It is important to keep the orders of magnitude involved here in perspective. While the number of males from a low SES background in HECS Band 3 courses declined appreciably by 38 per cent, this amounts to a fall of around 300 to 200 students. This is a relatively small number of students by way of comparison with the total number of 614,000 domestic students in higher education in 2001.

**Figure 11 : Share of undergraduate commencements from HECS Band 3**



Source : DEST, Higher Education Statistics Collection

## Conclusion

Simple economic theory suggests that increasing student charges will diminish the attractiveness of higher education over other pursuits. However, analysis of the impact of HECS is not straightforward because of the general expansion in the provision of places and the vagaries of the economic cycle that affect the demand for education. Our findings are:

- There is no evidence that the introduction of HECS in 1989 did have an effect on demand, at least as measured by applications through State Admissions Centres. Any theoretical dampening in demand was clearly swamped by the general expansion of opportunities at the time of its introduction;
- There is some evidence that the changes introduced in the 1996 Budget had an impact :
  - Our analysis is consistent with the view that demand among prospective school leaver and mature age applicants declined;
  - Examination of patterns of commencing students suggests older persons appear to be more sensitive to HECS changes. In particular, older persons new to higher education or studying part-time or externally appear more responsive to HECS changes;
  - There is no apparent adverse effect on the overall share of commencing students from a low SES background. That said, the introduction of differential HECS charges may have deterred a relatively small number of males from a low SES background from enrolling in the more expensive HECS Band 3 courses.
  - The lower repayment threshold is more likely to have deterred persons from combining work and part-time study. Full-time students, given they have lower incomes, were less likely to have been affected by the lower threshold.

It is important that the changes described above are kept in perspective. In absolute terms, the 1996 HECS changes are likely to have affected more persons in middle age groups, in the 25-39 year-old age range, since participation generally declines with age. We estimate that around 100 males from a low SES background are likely to have been deterred from entering HECS Band 3 courses.

Notwithstanding the likely impact of HECS, there has been a very substantial expansion of opportunities in higher education over the last decade. Remember, at the outset that this was one of the major goals of the 'Dawkins' reforms. Participation in higher education climbed appreciably by 25 per cent between 1989 and 2000<sup>17</sup>. HECS has played a major role in facilitating greater access to higher education: HECS charges constitute a significant part, 25 per cent, of teaching revenues<sup>18</sup>. In the absence of HECS, the sector would be appreciably smaller than it is today. Nevertheless, the 1996 HECS changes did have some effect on demand and any further developments to the scheme must be mindful of this.

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<sup>17</sup> The participation rate of non-overseas 15-64 year-olds in higher education increased from 3.7 per cent in 1989 to 4.7 per cent in 2000.

<sup>18</sup> We define teaching revenues as Commonwealth grants pursuant under the Higher Education Funding Act (HEFA), HECS charges and 50 per cent of superannuation charges.

## APPENDIX :

### A HISTORY OF THE HIGHER EDUCATION CONTRIBUTION SCHEME (HECS)

**1987**

#### **Higher Education Administration Charge**

- A Higher Education Administration Charge of \$250 per annum was introduced as a contribution towards the administrative costs of institutional budgets. The Charge applied equally to all Australian students undertaking award courses and was indexed annually. The Commonwealth general grant to universities was reduced by an amount equivalent to 90% of the revenue estimated to be derived from the charge. The Charge was discontinued in 1989 when the Higher Education Contribution Scheme (HECS) was introduced.

**1988**

#### **Committee on Higher Education Funding**

- The Government established the Committee on Higher Education Funding (chaired by Neville Wran) at the end of 1987 to investigate ways of funding growth in the higher education system. In its report of April 1988 it recommended the establishment of HECS. The Committee recommended a three tier contribution rate so that those taking high cost courses paid more than those taking lower cost courses. The Government announced the introduction of HECS in August 1988. One contribution rate was to apply, regardless of the course. All funds raised by the Scheme were to be used to help finance the expansion of the higher education system.

**1989**

#### **HECS was introduced on 1 January 1989.**

The Scheme had the following key features:

- There was an annual course contribution of \$1800 (approximately 20% of average course costs) for a full-time student undertaking a standard program. The contribution level was to be adjusted each year in accordance with the Higher Education Operating Grants index.
- Students could choose to pay the contribution as a lump sum with a 15% discount or to defer their payment and repay through the taxation system when their taxable income reaches an indexed minimum threshold for a particular year.
- Repayment rates for the 1988-89 financial year were as follows:

For taxable incomes in range	% rate to be applied to taxable income
under \$22,000	nil
\$22,000-\$24,999	1%
\$25,000-\$34,999	2%
\$35,000 and above	3%

**1990**

- After indexation the HECS contribution rose to \$1882.

- Repayment rates for the 1989-90 financial year were as follows:
 

For taxable incomes in range	% rate to be applied to taxable income
under \$23, 583	0
\$23,583-26,798	1%
\$26,799-37,518	2%
\$35,519 and above	3%

### **1991**

- After indexation, the HECS contribution rose to \$1993.
- Rates of repayment increased to be applied to each of the income thresholds from 1 per cent, 2 per cent and 3 per cent to 2 per cent, 3 per cent and 4 per cent, effective from the 1991-92 income year.
- Repayment rates for the 1990-91 financial year were increased were as follows:
 

For taxable incomes in range	% rate to be applied to taxable income
under \$25,469	0
\$25,469-28,941	2%
\$28,942-40,519	3%
\$40,520 and above	4%

### **1992**

- The Contribution was increased to \$2,250, an increase of \$144 above normal indexation.
- Repayment rates for the 1991-92 financial year were as follows:
 

For taxable incomes in range	% rate to be applied to taxable income
under \$27,098	0
\$27,098-30,793	2%
\$30,794-43,112	3%
\$43,113 and above	4%

### **1993**

- After indexation, the HECS contribution rose to \$2,328.
- The discount for up front payers was increased from 15 per cent to 25 per cent with the aim of lifting the number of up front payers.
- Compulsory up front payments were introduced for New Zealand citizens resident in Australia continuously for less than two years and permanent residents whose term address is overseas for a reason other than a requirement of the course.
- Repayment rates for the 1992-93 financial year were as follows:
 

For taxable incomes in range	% rate to be applied to taxable income
under \$27,748	0
\$27,748-31,532	2%
\$31,533-44,146	3%
\$44,147 and above	4%

## 1994

- After indexation, the HECS contribution rose to \$2,355.
- PAYE repayment arrangements were introduced from July 1994. Employers were required to deduct additional tax instalments, to cover HECS repayment on a PAYE basis if students' incomes exceeded the minimum level of average weekly earnings.
- Rates of repayment increased to be applied to each of the income thresholds from 2 per cent, 3 per cent and 4 per cent to 3 per cent, 4 per cent and 5 per cent, effective from the 1993-94 income year.
- Minimum HECS repayment thresholds were rebased to reflect current Average Weekly Earnings. The indexation of thresholds changed from CPI to AWE from the 1993-94 financial year.
- Repayment rates for the 1993-94 financial year were as follows:

For taxable incomes in range	% rate to be applied to taxable income
under \$26,403	0
\$26,403-30,004	3%
\$30,005-42,005	4%
\$42,006 and above	5%

## 1995

- After indexation, the HECS contribution rose to \$2,355.
- Repayment rates for the 1994-95 financial year were as follows:

For taxable incomes in range	% rate to be applied to taxable income
under \$26,853	0
\$26,853-30,516	3%
\$30,517-42,722	4%
\$42,723 and above	5%

## 1996

- After indexation, the HECS contribution rose to \$2,442.
- The following changes were introduced for non-citizens to take effect from the beginning of 1996:
  1. removal of 25 per cent discount for compulsory up front payments
  2. up front payment for all New Zealand citizens commencing a course of study on or after 1 January 1996
  3. up front payment for permanent residents, both granted permanent resident status and commencing their course of study on or after 1 January 1996 once they have satisfied the residency requirements for Australian citizenship and first satisfied those requirements more than 12 months previously. (No permanent resident will be in such a position until 1999 at the earliest.)
- From the beginning of 1996 a 15 per cent bonus for voluntary payments over \$500 was introduced. Voluntary payments can be made at any time to the ATO, when a payment of \$500 or more is made the students HECS debt is reduced by the amount of the payment plus a

further 15% of that payment. That is, for every \$1 paid a \$1.15 is taken off the students HECS debt.

- A voluntary repayment threshold with a 10 per cent discount on the debt at the time of the first voluntary repayment was introduced for the 1995-1996 financial year. From 1 January 1996 a student could make the commitment to repay their HECS debt at 2% of their HEC repayment income when that income is above the voluntary threshold (\$20,000 in 1995-96) but below the first compulsory threshold.

Under this option when the student's HEC repayment income reached the voluntary threshold for the first time, the Government deducted 10% from the student's outstanding HECS debt as a once off discount. Upon receiving the 10% discount, the option was irrevocable, with the 2% repayment was to apply to every year the student's HEC repayment income fell between the voluntary threshold and the first compulsory threshold.

- Repayment rates for the 1995-96 financial year were as follows:
 

For HEC repayment incomes in range	% rate to be applied to taxable income
under \$27,675	0
\$27,675-31,449	3%
\$31,499-44,029	4%
\$44,029 and above	5%

#### Changes for the 1996-97 financial year

- People repaying their HECS debt were required to include any amount their taxable income had been reduced by a net rental loss from the 1996-97 income year.
- Four intermediate repayment thresholds were introduced from the 1996-97 financial year at rates of 3.5 per cent, 4.5 per cent, 5.5 per cent and 6 per cent, effective from the 1996-97 income year. .
- Repayment rates for the 1996-97 financial year were as follows:
 

For HEC repayment incomes in range	% rate to be applied to taxable income
\$20,594-28,494 (voluntary threshold)	2%
under \$28,495	0
\$28,495-30,049	3%
\$30,050-32,381	3.5%
\$32,382-37,563	4%
\$37,564-45,335	4.5%
\$45,336-47,718	5%
\$47,719-51,292	5.5%
\$51,293 and above	6%

#### 1997

- Differential HECS contributions were introduced for students commencing a new course of study. Units of study are allocated to three bands and the amount paid for a unit of study depends on the band and its weight within a course. In 1997 the full-time full year contributions for each band were \$3,300 (Arts, Humanities, Legal Studies and Justice, Social Studies, Visual/Performing Arts, Education, and Nursing), \$4,700 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture,

Sciences, Engineering, Processing and Administration, Business and Economics) and \$5,500 (Law, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).

- Students who commenced or deferred, but did not complete, their course before 1997, may be regarded as continuing students. In 1997 the HECS contribution for continuing students was \$2,478 for a full time full year.
- The 2% voluntary repayment arrangements were abolished.
- Repayment thresholds were introduced from the 1996-97 financial year.

- Repayment rates for the 1997-98 financial year were as follows:

For HEC repayment incomes in range	% rate to be applied to taxable income
under \$20,701	0
\$20,701-21,830	3%
\$21,831-23,524	3.5%
\$23,525-27,288	4%
\$27,289-32,934	4.5%
\$32,935-34,665	5%
\$34,666-37,262	5.5%
\$37,263 and above	6%

### 1998

- Students who make a partial up front payment of \$500 or more of their HECS liability for a semester were given a 25% discount.
- Remission arrangements were simplified by replacing the two-tier application period with a single period of 12 months.
- After indexation, the full-time full year contributions for each band in 1998 are \$3,356 (Arts, Humanities, Legal Studies and Justice, Social Studies, Visual/Performing Arts, Education, and Nursing), \$4,779 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture, Sciences, Engineering, Processing and Administration, Business and Economics) and \$5,593 (Law, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).
- After indexation, the HECS contribution for continuing students is \$2,520 for a full-time full year.

- Repayment rates for the 1998-99 financial year are as follows:

For HEC repayment incomes in range	% rate to be applied to taxable income
Below \$21,334	0
\$21,334-\$22,498	3%
\$22,499-\$24,244	3.5%
\$24,245-\$28,123	4%
\$28,124-\$33,942	4.5%
\$33,943-\$35,726	5%
\$35,727-\$38,402	5.5%
\$38,403 and above	6%

## 1999

- After indexation, the full-time full year contributions for each band in 1999 are \$3,409 (Arts, Humanities, Legal Studies and Justice, Social Studies, Visual/Performing Arts, Education, and Nursing), \$4,855 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture, Sciences, Engineering, Processing and Administration, Business and Economics) and \$5,682 (Law, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).
- After indexation, the HECS contribution for continuing students is \$2,560 for a full-time full year.
- Repayment rates for the 1999-00 financial year are as follows:

For HEC repayment incomes in range	% rate to be applied to taxable income
Below \$21,984	0
\$21,984-\$23,183	3%
\$23,184-\$24,982	3.5%
\$24,983-\$28,980	4%
\$28,981-\$34,976	4.5%
\$34,977-\$36,814	5%
\$36,815-\$39,572	5.5%
\$39,573 and above	6%

## 2000

- The Guidelines for the Merit-based Equity Scholarships scheme are still current, however, the Government has announced a decision to phase out the scheme and no new scholarships will be available from 2000. Revised guidelines for continuing scholarship holders will be available in 2000
- After indexation, the full-time full year contributions for each band in 2000 are \$3,463 (Arts, Humanities, Legal Studies and Justice, Social Studies, Visual/Performing Arts, Education, and Nursing), \$4,932 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture, Sciences, Engineering, Processing and Administration, Business and Economics) and \$5,772 (Law, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).
- After indexation, the HECS contribution for continuing students is \$2,600 for a full-time full year.
- Repayment rates for the 2000-2001 financial year are as follows:

For HECS repayment incomes in range	% rate to be applied to taxable income
Below \$22,346	0
\$22,346-\$23,565	3%
\$23,566-\$25,393	3.5%
\$25,394-\$29,456	4%
\$29,457-\$35,551	4.5%
\$35,552-\$37,420	5%

\$37,421-\$40,223  
\$40,224 and above

5.5%  
6%

## 2001

- After indexation, the full-time full year contributions for each band in 2001 are \$3,521 (Arts, Humanities, Legal Studies and Justice, Social Studies/Behavioural Sciences, Visual/Performing Arts, Education, and Nursing, Justice and Legal Studies), \$5,015 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture, Sciences, Engineering, Processing and Administration, Business and Economics) and \$5,870 (Law, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).
- After indexation, the HECS contribution for continuing students is \$2,600 for a full-time full year.
- Repayment rates for the 2001 - 2002 financial year are as follows:

<i>For HECS repayment incomes in range</i>	<i>% rate to be applied to taxable income</i>
Below \$23,242.....	nil
\$23,242 - \$24,510 .....	3.0%
\$24,511 - \$26,412.....	3.5%
\$26,413 - \$30,638.....	4.0%
\$30,639 - \$36,977.....	4.5%
\$36,978 - \$38,921.....	5.0%
\$38,922 - \$41,837.....	5.5%
\$41,838 and above.....	6.0%

## 2002

- After indexation, the full-time full year contributions for each band in 2002 are \$3,598 (Arts, Humanities, Legal Studies and Justice, Social Studies/Behavioural Sciences, Visual/Performing Arts, Education, and Nursing, Justice and Legal Studies), \$5,125 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture, Sciences, Engineering, Processing and Administration, Business and Economics) and \$5,999 (Law, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).
- After indexation, the HECS contribution for continuing students is \$2,702 for a full-time full year.

## 2003

- After indexation, the full-time full year contributions for each band in 2003 are \$3,680 (Arts, Humanities, Legal Studies and Justice, Social Studies/Behavioural Sciences, Visual/Performing Arts, Education, and Nursing, Justice and Legal Studies), \$5,242 (Mathematics, Computing, Other Health Sciences, Agriculture, Renewable Resources, Built Environment/Architecture, Sciences, Engineering, Processing and Administration, Business and Economics) and \$6,136 (Law, Medicine, Medical Science, Dentistry, Dental Services and

Veterinary Science).

- After indexation, the HECS contribution for continuing students is \$2,764 for a full-time full year.

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