**FINANCING HIGHER EDUCATION IN AUSTRALIA:
THE CASE FOR SUPERHECS***

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1. Recommendations

Recommendation One: Operating Grants at 50 percent

As part of an integrated package of reforms to the university sector, the public operating grant should be set at a uniform proportion of average DEETYA determined course costs. An operating grant equal to 50 percent of cost would probably be sufficient to meet perceived government objectives of achieving cost savings and maintaining a viable university sector.

Recommendation Two: Specific Scholarships

Scholarships should be provided to accommodate temporary shortages of specific skills. These scholarships need to be carefully targeted on the skill in shortage. The number of scholarships and the eligible fields should be determined on an annual basis.

Recommendation Three: Implicit Vouchers

The public operating grants to higher education should be paid directly to universities on the basis of actual student load. A minimum standard for entrance to universities will need to be set to effect a control over the budget allocation to the higher education sector. Universities should be permitted to set higher standards for entrance if this is consistent with their mission.

Recommendation Four: SuperHECS

Universities should be permitted to levy HECS-able fees called SuperHECS to supplement the public operating grant to higher education. Universities should have full control over the level of SuperHECS.

Recommendation Five: Unchanged Borrowing Fee

All university fees should be paid through the HECS system and universities should be paid 75 percent of the value of any HECS-able fees levied in the year the SuperHECS is levied. -The 25 percent difference between student payments and university receipts is viewed as a service fee in lieu of interest, risk spreading and administration costs.

Recommendation Six: Non-DEETYA Places

Institutions may offer full-fee places to local students who are not eligible for a publicly subsidised place at their preferred university. The full-fee should be seen as comprising

an 'up-front' payment equal to the public operating grant for their particular course and the SuperHECS fee for the course. The 'up-front' fee should be payable via a funding scheme like the AUSTUDY Supplement operated by the government or the institution.

Recommendation Seven: Taxation

SuperHECS repayments net of the 25 percent service fee and all 'up-front' charges should be allowed as a deferred deduction against taxable income attributable to the investment in human capital. From a practical perspective, we recommend a twenty-year write-off period.

Recommendation Eight: Research Allocation

The appropriate allocation of research monies across broad disciplines is to achieve the equalisation of the marginal returns from the last dollar spent in each discipline. The allocation of research monies within a discipline should be by means of a formula specific to each discipline and/or by peer review.

Recommendation Nine: Research Quantum Raised

The amount of monies available for distribution through the Research Quantum should be reviewed to take account of changes in the 1990s to the emphasis given to research at Australian institutions of higher education and the implications of the reform package outlined for the exclusion from the research quantum of the costs of research activities inextricably linked to higher degree research training.

2. Higher Education Funding in Context

In the Higher Education Budget Statement for 1996-97, Senator Vanstone (1996) suggested that Australian higher education has reached an important crossroad and that a series of fundamental issues needed to be considered if the challenges and opportunities of the next two decades were to be addressed. One of these fundamental issues was funding strategies.

In recent years, and for the immediate future, the Higher Education sector has been required to make a contribution to the government's deficit reduction task. Reductions in operating grants for 1998 and 1999 were outlined in the 1996-97 budget, the cumulative reduction being projected at 4.9 percent. The challenge for the higher education sector is to be able to reorganise its activities and deliver quality programs with fewer resources, or to seek alternative funding arrangements that might expand the resources available. Incentives for universities to charge fees for Australian students were expanded in the recent budget, and a less interventionist role for the government was foreshadowed. We are not convinced, however, that these changes go far to resolve the funding issue satisfactorily.

In this report we provide an examination of the current funding arrangements for higher education in Australia. By appeal to theoretical argument, we establish a logical structure for the setting of fees for places at universities. Implementation of our recommendations for an integrated package of tertiary funding arrangements will provide a framework which will give institutions considerable autonomy with respect to the price set for specific courses and also the quality of the courses; present students with far greater choice than they currently enjoy; enhance quality in teaching and research; encourage more efficient arrangements within the higher education sector; and be fair to all eligible students who wish to enter university and also be fair to the Australian taxpayer. We argue that a funding strategy based on the set of recommendations in this report is a viable alternative that will lead to greater diversity and enhanced performance in the tertiary sector in Australia.

How much diversity will be attained and how much performance will be improved depends on the level of public spending on higher education as well as on how it is spent. Whatever is the level set by government for operating grants to the universities, adoption of our proposals should lead to more efficient and equitable outcomes. As to level itself: the funding arrangements that we suggest are not intended to make it easier or harder for government to reduce federal outlays on university operating grants; and are not designed specifically to reduce these grants. However, our proposals do have some implications for the public finances. The integrated set of proposals have the character that if, having adopted them, governments subsequently reduce the operating grants, there will be some resultant increase in the financing burden on the public sector. This will flow from the system of loans for the payment of tuition fees and from the tax credits for tuition fees paid.

3. A Brief History of Public Funding of Higher Education in Australia

There are three major topics that need to be considered in the context of the public funding of higher education in Australia. The first is the funding provided to tertiary institutions by government. Of central concern here is the funding mechanism. The second is the contribution expected from students towards the costs of higher education, and the means through which this contribution is paid. The third is the financial assistance provided to students in the form of living allowances.

3.1 Funding by Government: The Relative Funding Model

The origin of the Relative Funding Model (RFM) is the 1988 White Paper, *Higher Education: A Policy Statement*. The details are contained in DEET (1990), with the major policy changes being reflected in the determination of institutional operating grants from 1991 onwards. The main theme driving the introduction of the RFM was the establishment of equitable funding arrangements in the unified system of higher education. The model is described in DEET (1990) as being:

- simple;
- designed for use at the system level only; and
- comprised of separate teaching and research-related components.

The teaching component is held to reflect the relative cost of teaching in different discipline cost clusters at different levels. To determine this relative cost structure, three teaching cost studies were commissioned: the INTEREX Ltd. study of four institutions of higher education in Western Australia (the University of Western Australia, Murdoch University, Curtin University of Technology and the Western Australian College of Advanced Education); the Capricornia Institute study of three universities and four colleges of advanced education; and the Melbourne University study of selected Victorian institutions (University of Melbourne, Melbourne College of Advanced Education, La Trobe University, Ballarat College of Advanced Education). The methodologies used in these studies vary appreciably. It is not a productive exercise to provide a critical assessment here. Rather, it can simply be noted that historical rather than ‘ideal’ costs were analysed in the studies.

The cost relativities established by the commissioned studies were sorted by disciplines into groups of comparable costs to form an appropriate matrix. A number of constraints were imposed on the process, including that there should be no significant transfer of funds between the former advanced education sector and the former university sector, and there should be no major distortions in relativities for those institutions with a high proportion of load in a single discipline. A model that had an acceptably low variability of cluster discipline costs at each level and “also satisfied the requirements of simplicity, accuracy, minimisation of distortion” (Relative Funding Model: A Draft Proposal, p.25) was constructed. This was subsequently refined in response to comment.

Ten cells were included in the final cost matrix, five at the undergraduate level, three at the postgraduate coursework level and two at the higher degree research level. The lowest funded disciplines at the undergraduate level are Accounting, Administration/Economics, Law

and Other Humanities (*e.g.*, English, History, Philosophy). The cells in the cost matrix provide the teaching costs relative to the lowest funded disciplines. For example, the highest funded disciplines at the undergraduate level are Agriculture, Dentistry, Medicine and Veterinary Science, with a cost relativity of 2.7. An appraisal of this methodology is contained in DEET (1990, p.9): "...the use of historical costs entrenches past system and institutional decisions about the allocation of resources. The use of such costs also assumes that the aggregation of historical funding decisions can adequately explain current expenditure patterns. It is considered that the historical cost data provide the most reliable indicator of real costs that is presently available."

The research component was intended to support research activities other than for those inextricably linked to higher degree research training (the costs of which were recognised in the allocation of the teaching component of the model). It was estimated to represent approximately six percent of the total operating grant, and the size of the research-related component of the model was not raised as a significant issue by respondents to the RFM draft proposal. No attempt was made to have the distribution of the research quantum reflect inter-disciplinary differences in the cost of generating measurable indices of output. In the first instance, the research component was distributed simply in proportion to an index of performance in obtaining Commonwealth competitive research funds (National Competitive Research Grants index). DEET (1990), however, foreshadowed that a more comprehensive index of funding would be developed.

Changes to the research quantum of the RFM were effected in 1995 when the National Competitive Research Grants index was replaced by a Composite Competitive index. This more encompassing measure incorporates (i) research grants from a wider range of sources; (ii) research publications; and (iii) research degree completions. The weights given to these components were initially 0.9:0.07:0.03 and modifications to these over time were projected, with the weights in 1998 to be 0.775:0.175:0.05.

The RFM was intended as a 'one-off' application for grant adjustment purposes. A tolerance band of plus or minus three percent was stipulated, with institutions within this band being presumed to be equitably funded. For institutions outside the band, adjustments over the 1991-93 triennium and beyond if necessary were anticipated.

An important element of the planning process in higher education since 1988 has been the profile negotiations. The AVCC (1989, p.4) described the profile negotiations as "primarily concerned with determining the discipline areas in which new student intakes will occur, and the price the Commonwealth will pay for those intakes this procedure has generally suited the Government because it has allowed the Minister of the day to demonstrate how the problems of excess demand and equity are being tackled by the provision of additional funded student places". Major changes to the profiles mechanism were foreshadowed in Vanstone (1996, p.19) in order to "simplify the procedures, reduce needless reporting and data collection and move to a process whereby institutions are accountable for the goals articulated in their own strategic plans". Consultations with the higher education sector were planned to put these intentions into effect.

The funding mechanism for higher education in Australia is described in Anderson *et al.* (1996, p.1) as student driven, with funds allocated to universities in “fairly direct relation to the number of students they have and the subjects in which the students have chosen to enrol” (although load variations around profile load do not automatically result in changes in funding) . It is a blunt financing mechanism that provides few incentives for universities to develop in diverse ways. This situation is reinforced by the fact that the RFM, modified by politicking internal to each institution, has been used to distribute monies within institutions, even though DEET explicitly argued against this use.

There is considerable concern over the administrative burden associated with data collection procedures, particularly with the publications output component in the Composite Competitive Index used to distribute the Research Quantum. In 1996 the Research Quantum amounted to slightly less than five percent of the total operating grant, and the desirability of the higher education sector engaging in a costly process of compiling and verifying research publications for a relatively small component of funding is open to debate. Anderson *et al.* (1996, p.56) argue “The publications item is ostensibly the least efficient and reliable element in the composite index because of the high cost involved in data collection and the difficulties of verification it presents. **Its capacity to make an independent contribution to the research quantum is limited by the extent of its correlations with other elements, .94 with income and .91 with completions**” (emphasis added).¹ Finally, the emphasis given to quantity rather than quality in the Research Quantum is held in some quarters to be detrimental to good scholarship.

3.2 Contributions by Students to the Cost of Higher Education

Until 1974 tuition fees were generally charged for university education in Australia. These fees represented about 15 percent of course costs (Committee on Higher Education Funding (1988a, p.3)).

In 1974 the Whitlam Labor Government effectively assumed full financial responsibility for tertiary education and instituted two major reforms: it abolished tuition fees and established a ‘universal’ means-tested grants scheme (the Tertiary Education Assistance Scheme) to replace the merit-based Commonwealth Scholarship scheme.

In 1988 the Committee on Higher Education Funding (Wran Committee) proposed a tax debit scheme to help fund higher education. There are three main components of the Wran Committee proposal. First, students incur a tax debit for each year they enrol in a higher education course. The Wran Committee proposed that the amount of the tax debit should vary by type of course, with the recommended levels (in 1988 dollars) being \$3,000 for courses in medicine, dentistry, agriculture, forestry and veterinary science, \$2,500 for

¹ The correlation of publications with research income varies by discipline (Stanley’s (1996, p.15) data suggest the correlation ranges from .54 to .95), and publications may therefore be a useful component of an inter-disciplinary distribution mechanism within an institution. Data on publications may also be a useful component of an inter-university distribution mechanism within a discipline.

engineering and science, and \$1,500 for the remaining courses. These levels were argued to represent about 20 percent of the direct costs of higher education. Second, the tax liability accumulated during tertiary studies would be discharged by payment of a levy of two per cent of taxable income, conditional upon taxable income in excess of the average earnings for all workers. These payments would be administered through the tax system. The obligation to pay the levy would cease once the tax debit had been paid in full. Finally students would be allowed to pay their course fee at the time of enrolment if they desired, and a discount scheme was envisaged to make this an attractive option.

The Wran Committee's proposals have formed the basis for the financing of Higher Education since 1988. The proposals were, however, modified prior to implementation. Thus, when first implemented in 1989 through the Higher Education Funding Act, 1988, the tax debit was at the uniform rate of \$1,800, the repayments were on a graduated scale (no repayment where income was less than \$22,000, one percent repayment rate where personal taxable income was between \$22,000 and \$25,000, two percent repayment rate where personal taxable income was between \$25,000 and \$35,000 and three percent repayment rate where personal taxable income was over \$35,000) and a 15 percent discount was allowed where students paid their annual course charge up-front.

Since it was introduced in 1989, the Higher Education Contribution Scheme (HECS) has undergone a number of changes, including changes to the repayment thresholds, repayment rates, and levels of tax debit. The arrangements for 1997 included differential HECS charges, which were justified on the grounds of differences in both the cost of the course undertaken and the likely future benefits in terms of lifetime earnings (Vanstone (1996, p.8)). Changes announced in the 1996 Budget were:

- HECS contributions vary by course of study, with three levels of HECS, namely:

Humanities, Social Studies, Visual/Performing Arts, Education and Nursing attract a HECS contribution of \$3,300 per year for a full-time student.

Mathematics, Computing, Health Sciences, Agriculture, Renewable Resources, Built Environment, Sciences, Engineering, Processing and Administration, Business and Economics attract a HECS contribution of \$4,700 per year for a full-time student.

Law, Justice, Legal Studies, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science attract a HECS contribution of \$5,500 per year for a full-time student.

- The minimum threshold at which repayments commence is \$20,701.
- Repayment rates vary from three percent of taxable income (income between \$20,701 and \$21,830) to six percent of taxable income (income of \$37,263 and above).
- 25 percent discount applies if the HECS liability is paid up-front rather than as a deferred tax liability.

How successful has HECS been? The general consensus seems to be that “...the impact of HECS has been slight at the point of entry. For undergraduates already in the system, external studies students were affected most. The greatest impact of HECS was on post-graduate students, and in particular on part-time students in the income range where the liability for payment of HECS fell in the current fiscal year” (Robertson, Sloan and Bardsley (1990, p.24)). From other perspectives, however, the situation is less encouraging. Chapman (1988, p.172), for example, describes the Wran proposals as “... the policy prescription is overwhelmingly motivated by issues of equity and access, and only under certain assumptions is weight placed on conventional notions of economic efficiency”. Further, he states (p.182) “...if economic efficiency was the only game in town, HECS would not get a look in”. One area where HECS has been adjudged successful from the economic efficiency perspective is in terms of correcting capital market imperfections, and this has been emphasised in Chapman’s recent work (see, for example, Chapman (1992, p.19) (1996) (1997)). This issue is examined below.

3.3 AUSTUDY

In the 1986-87 Budget the government announced that from January 1, 1987, the three main schemes of community-wide student assistance, the Secondary Allowance Scheme, Adult Secondary Education Assistance Scheme and the Tertiary Education Assistance Scheme (TEAS), would be combined into a single scheme. The new scheme, AUSTUDY, would be age-related, with different rates and conditions to apply to secondary, tertiary and adult secondary students.

The introduction of AUSTUDY was the third major reform of financial assistance to tertiary students in Australia in the post-World War II period. The first form of financial assistance was the Commonwealth Scholarship Scheme, and the second was the Tertiary Education Assistance Scheme. Teacher Education Scholarships are another form of financial assistance that might be considered. These non-means tested scholarships were phased out following the introduction of TEAS in 1974 (see AVCC (1983, p.11)).

The Commonwealth Scholarship Scheme operated between 1951 and 1965.² A primary feature of this scheme was that eligibility was based on academic merit. Two forms of financial assistance were provided: the first to cover compulsory fees and the second a living allowance. Assistance with compulsory fees was not subject to an incomes test while the living allowance was subject to a test on both parental and personal incomes.

In 1966 the Commonwealth Scholarship Scheme was revised, with scholarships subsequently being provided under the Commonwealth University Scholarship Scheme and the Commonwealth Advanced Education Scholarship Scheme. Eligibility under these schemes was also merit based. They continued until the end of 1973.

² This section is based on DEET (1988b) and Hayden (1981).

In 1973 the Whitlam Government abolished the merit-based Commonwealth scholarships and introduced the Tertiary Education Assistance Scheme (TEAS) for full-time students undertaking approved tertiary education courses. DEET (1988b, p.18) suggests that the major aims of TEAS were: (i) “paying eligible students an allowance, which would help maintain them while studying”, and (ii) “lowering barriers to educational participation for students from lower socio-economic backgrounds”.³

A fundamental difference between TEAS and its predecessors was that TEAS was non-competitive. The allowances paid, however, were incomes tested, and were paid subject to satisfactory academic progress. The incomes test was applied to both parental and personal incomes (dependent students) and to personal and (where relevant) spouse incomes (independent students). It was through the use of the incomes tests that the grants were targeted. DEET (1988b, p.55) notes, however, that “Access to the scheme was increasingly restricted...the ‘average’ family for whom TEAS was originally designed to cater was progressively shifted to the margins of the scheme”. Chapman (1992, p.49) argues that it is not credible to make definitive conclusions about the effect of TEAS on the level or mix of tertiary enrolments.⁴

As noted above, AUSTUDY was introduced in 1987. Its aim was to “overcome financial barriers to the continuation of secondary and tertiary education by providing income support to financially disadvantaged students taking full-time studies”⁵. Under this scheme, financial assistance is provided on a non-competitive basis. The level of financial assistance is age-related, and it is subject to satisfactory course progress. Eligibility is also determined by income and assets tests (since 1989). One of the major problems associated with AUSTUDY, at least in its early forms, is that the rules for eligibility were not sufficiently sensitive to the “myriad of personal financial needs of prospective students and thus as a consequence do not offer the right level of assistance to the right people” (Chapman (1992, p.131)).

Currently, AUSTUDY distinguishes between independent and dependent students. Independent status is determined by being aged 25 years or over when the course is commenced in 1997, being married, having a dependent child, having been in the workforce full-time for at least three of the past four years and certain hardship situations (homeless, orphan). There are different payment levels for independent students under 18 years of age, those who are sole parents or who are members of special groups. The amount paid depends on the individual’s and (where relevant) partner’s/de-facto’s income and also on the

³ Reports such as DEET (1988b) have indicated that the aims of TEAS were never clearly articulated in policy documents.

⁴ In 1991 the House of Representatives Standing Committee on Employment, Education and Training issued a report entitled *Student Financial Assistance*. In this they noted (p.5) that “In the absence of proper program evaluation it is not possible to assess the effectiveness of student assistance over the past 15 years other than to observe that the social mix in higher education does not appear to have significantly changed.” Chapman (1993, p.107) offers a similar conclusion that extends to AUSTUDY.

⁵ 1991-92 Budget Papers, cited in Chapman (1992, p.1).

individual's and (where relevant) partner's/de-facto's assets. The abatement rate in relation to both personal and partner's incomes is \$1 for every \$2 earned over the thresholds set.

For dependent students, the allowance varies with age (a simple dichotomy of under 18 years and 18 years and over), varies according to whether the student lives at home or away from home, and according to both personal and parents' incomes. The abatement rate on parents' income is a \$1 reduction in allowance for every \$4 that parents' income exceeds the threshold, while the abatement rate on personal income is \$1 for every \$2 earned beyond the threshold. Eligibility is also subject to a family assets test (covering the assets of both parents and dependants).

Parent's and partner's income is defined wider than taxable income; it includes, for example, fringe benefits over \$1,000 and rental property loss.

An AUSTUDY supplement is available to AUSTUDY recipients and also to those who would have received AUSTUDY other than for the parental income test (and parents' adjusted income falls below a threshold). The supplement is jointly run by DEETYA and the Commonwealth Bank. Under it students can give up between \$250 and \$3,500 of their AUSTUDY and get double the amount in the form of a (real) interest rate free, income-contingent loan.⁶ No repayments on the loan are required for five years, and repayments are then only required where taxable income exceeds average earnings. Voluntary payments within the five-year moratorium attract a discount (15 percent) and after five years the debt is transferred from the Commonwealth Bank to the Government and is repaid through the tax system.⁷

4. The Case for Public Funding of Education

Provision of a subsidy to tertiary students in the order of the 80 percent of course costs suggested by the Wran Committee may be justified on both economic efficiency and equity grounds. From the economic efficiency perspective, the arguments in favour of public assistance to the higher education sector include: there are considerable externalities associated with tertiary studies that benefit the wider community; the cost structures in the tertiary sector prevent the application of efficient pricing schemes and thus result in under-provision; there are imperfections in capital markets that make it difficult for students, or particular groups of students, to obtain loans; and the existence of certain distortions to

⁶ This describes the situation for students in receipt of AUSTUDY. For the second category of students who meet all the criteria for AUSTUDY except the parental income test, an amount of between \$500 and \$2,000 is available through the AUSTUDY supplement.

⁷ The supplement follows an option outlined in Chapman (1992). It is in the tradition of previous studies, for example AVCC (1983, p.35) recommended that "to avoid the possibility that students' choices of courses and careers will be influenced by the need to repay a loan, the principle of income-contingent repayments should be introduced and administration should be through the taxation system."

individual decision making that cannot be corrected more expeditiously by other means require a second-best correction in the form of public funding. Of primary concern in the latter instance is the impact of the tax system on educational choice. The cases for subsidy on the basis of externalities, capital market imperfections or due to tax considerations are independent, and we keep the relevant issues separate in the analysis which follows. The equity considerations are anchored in the case for a redistribution of life chances.

4.1 Efficiency Arguments for Public Funding of Education

4.1(a) Externalities

Externalities are those benefits (or costs) of a transaction that are not received (or paid) by the parties to the transaction. They constitute a form of market failure. For the efficient use of society's resources, external benefits need to be internalised through the payment of an appropriate subsidy to the decision maker generating the externality.

Externalities may be categorised in various ways. They may, for example, be analysed on the basis of incidence. Alternatively, they could be analysed on the basis of source. Where the categorisation is on the basis of incidence, a distinction could be made between externalities that are conferred on an individual and externalities that are conferred on the community in general. This categorisation is useful where one is seeking to determine who should contribute towards any payment for the externality. Where the categorisation is by source, a distinction may be made between externalities generated by students, and externalities generated by the staff of the educational institutions. This distinction is useful where one is seeking to determine the groups that might be subsidised as a result of the externalities. Where the externalities are generated by students, a subsidy of the teaching functions of education providers is called for. But where the externalities are generated by staff, it would be more appropriate to provide a subsidy to the research function of the educational institutions.

An individual externality arises where an educated person confers benefits on another. For example, better educated supervisors may raise the productivity of their workers (*i.e.*, from advice given, or where co-workers imitate the skills of better educated workers) and not appropriate the benefit themselves; or educated individuals might assist their siblings; or educated parents might assist their children. The second category of externality is community benefits. Community benefits might be simply associated with the national prestige that is thought to be attached to having a highly educated society, or the improvements in the character of society and the quality of both economic and social decisions. Olson (1996) argues that the boundaries between rich and poor nations are determined largely by the institutional arrangements in countries (legal systems, political structures and the extent of special interest lobbies and cartels). A better educated population is presumably more respectful of property rights, demanding of a democratic political system and less tolerant of extreme interest lobbies. An educated society may therefore be far better placed to deliver national prosperity than an under-educated society. Additional community externalities which are often discussed are the general advances in knowledge that are held to be associated with a more educated population. Clare and Johnston (1993, p.55) pay special attention to the role of human capital as an engine of growth in explanations of some of the recent strong economic performances in Asia. While on-the-job training was felt to be the most important aspect of growth, schooling may be a complementary factor: Acemoglu (1996) has argued that firms will structure their workplace and modify their technology in response to increases in the human capital stock of the workforce.

It will be apparent that some of the externalities mentioned above will be generated by students. These will predominantly be the individual externalities, and the merit good aspects

of education, such as the more favourable attitudes to growth among the better educated, and the improvements in the character of society and the quality of both economic and social decisions. However, while some of the general advances in knowledge associated with education may derive from the student population, by far the greater share of these may derive from staff engaging in scholarly research. Thus, there may be a case for government subsidies to both teaching and research. Fane (1984), for example, suggests that the externalities associated with research provide a rationale for government research grants.

There has been debate over whether the externalities from education vary with the level of education. Many question whether all the externalities will carry over to the tertiary sector. Thus, it has been argued that the improvements in the character of society that appear to be an essential ingredient to economic prosperity are associated with primary and secondary education rather than post-secondary studies. Maglen (1976, p.40) concludes "It would appear, on *a priori* grounds, that there are very few effects of higher education that are not appropriated in some way by its recipient". Likewise, Fane (1984, p.21) asserts that it is "not clear whether the net external effects of education are positive or negative, and we doubt that any great inefficiency would result if policy decisions were based on the assumption that the net external benefits of education are zero". Moreover, it is generally conceded that if externalities in higher education are important, they will flow from the additions to society's stock of general knowledge. These externalities may be more likely to be associated with the research function of universities.

A further issue that needs to be recognised is that efficient use of society's resources requires that the marginal public subsidy is set equal to the marginal benefit generated. From the operational viewpoint, this translates into the average per student subsidy being equal to the marginal external benefit generated. While there may be external benefits of education generated by students, it may not necessarily be the case that there are positive marginal external benefits. To put this proposition bluntly: what value does society gain from the student with the lowest tertiary entrance score over and above any benefit that student might gain from tertiary education?

Placing a value on any of the externalities linked to the higher education sector has, however, proven extremely difficult (see Hope and Miller (1988, p.39)). To proceed one can resort to public finance theory. When the market does not place a value on the good, a political decision-making mechanism can be used. Public preference surveys reveal the electorate is sympathetic towards continued subsidies for the education sector.⁸ The comments by Freebairn, Porter and Walsh (1987, p.115) might provide a useful guide here. They argue for the provision of a 50 percent subsidy for university operations and note that this "should be regarded as a pragmatic exercise which recognises that for any university or college to survive in something like its present form would require a degree of subsidisation; and that universities and colleges do have some public-good attributes which are worthy of public support".

⁸ See, for example, the findings of the Newspan conducted by the Australian Vice-Chancellors' Committee reported in *The Australian* on April 30 1997. According to this survey, six in ten Australians thought that government spending on higher education was too low.

Separation of the subsidy that university research activity might warrant (and accommodating this by direct subsidies in the form of grants) from that for teaching would support a general subsidy below this 50 percent level.

It is apparent, therefore, that there is little direct evidence that can be brought to bear on the magnitude of the externalities of higher education (and hence the value of this parameter). In the discussion on the efficient structure of fees below, the subsidy rate linked to externalities will be treated as a parameter for the government to set within the efficient pricing scheme outlined. A single parameter, as a percentage of DEETYA determined average course costs, is used and calculations are undertaken for a range of possible values. As there is even less evidence that can be brought to bear on the issue of different levels of externalities (the literature does not advance any credible arguments in this regard) and hence subsidies across course types, institutions or students, arguments in this direction are not entertained.

4.1 (b) University Cost Structures and Marginal Cost Pricing

There is a literature in economics that attempts to estimate cost functions for the tertiary sector. Throsby (1986) is an often-quoted example. Other studies in the Australian literature include Lloyd *et al.* (1993) and Throsby and Heaton (1995).⁹ The average cost and marginal cost functions derived by Throsby follow the text-book U-shaped functions. Importantly, Throsby's work shows that the majority of Australian universities are less than optimal size when evaluated using a least operating cost criterion. For institutions operating below optimal size, marginal cost is less than average cost.

Economic efficiency requires goods to be priced at a level that reflects marginal cost. However, in situations where institutions are operating over a range of costs where marginal cost falls short of average cost, the revenues generated under marginal cost pricing will not cover costs. In this instance, to prevent under-provision of the good, the economically efficient pricing scheme will need to be supported by government subsidy (Brennan (1988)). Brennan (1988, p.157) suggests the subsidy might vary from 25 to 50 percent of course costs. The more recent research by Lloyd *et al.* (1993) suggests that the economies of scale are not large and that the value of the subsidy might, therefore, be considerably less than the figures used in Brennan's illustration. Any subsidy justified on the basis of the cost structures of universities would be a subsidy to students rather than to staff, that is, it should be paid in the form of vouchers or reduced fees rather than in the form of research grants. It is to be emphasised, however, that this subsidy is independent of arguments about the existence and value of externalities.

4.1(c) Capital Market Imperfections

Educational investments are embodied in the individual. They cannot, therefore, be offered as collateral for loans. Thus in the event of default, an agency lending for an investment in

⁹ While these studies are now out of date, they provide a useful benchmark for discussion.

education would not have a claim to any asset that could be liquidated to recover their outlay. Consequently, banks would charge a higher rate of interest to compensate for the lower security attached to a loan for educational purposes than is attached to a loan for investment in property, which may be mortgaged.

Moreover, banks will typically have little information on the future income streams of individuals which might enable them to assess repayment probabilities. Consequently, to minimise the cost of borrowing for some groups, they may risk-rate potential borrowers on the basis of observable indicators such as family background. Favourable rates of interest might be offered to students from wealthy families as their parents might be able to act as guarantor for their child's loan. The net result would be that individuals from less affluent families have more limited access to capital markets.

A further factor that has been advanced as indicative of capital market imperfections is the unavailability of insurance against the risk associated with investment in human capital. Although, on average, degree holders do extremely well in the labour market, an individual degree holder is not guaranteed a job, let alone a high paying job. This means the investment in education is quite risky (see, for example, Hope and Miller (1988, p.45)). A market solution in the form of insurance does not arise in this instance because the low-income outcome to be insured against is partly endogenous. Concern about genuinely not being able to repay loans for education purposes, and the effect that default would have on subsequent credit ratings, may deter some human capital investment.

A theoretical solution to these capital market imperfections is income-contingent loans. The Higher Education Contribution Scheme is an income-contingent loans scheme operated through the tax system. It provides default insurance. In addition, the income-contingent nature of the HECS scheme removes concerns that economic minorities will find their tax debits more burdensome to repay than other groups, and as such it provides equal access for all students who have qualified for a tertiary course.

The cost of operating an income-contingent loans scheme can be viewed, in part at least, as the cost of correcting this capital market distortion. The setting of the real interest rate and the determination of liability for administrative charges in the scheme are therefore moot points. It would certainly be inconsistent with efficiency objectives to charge market rates. Equally, it is difficult to substantiate a case for providing students with access to funds at zero real cost. The current practice with HECS is an intermediate situation where the service fee charged is equivalent to the differential between the up-front fee and the tax liability under deferred payment. As is shown below, this service fee is, in some situations, a highly subsidised charge for access to the income-contingent loans scheme.

4.1(d) Correcting Other Distortions: The Tax System

The Australian tax system discriminates against investment in education. Consideration of fairness and efficiency both argue for the removal of the discrimination from the tax law. A country that wants to be rich, in a world where wealth derives from information and

knowledge, should seriously consider why it discriminates against the acquiring of education and knowledge, and against the acquiring of capacity to generate, uncover and use information.

At the basis of the tax discrimination is the decision not to treat self-educational expenses as capital expenditures. Self-education expenses are deductible if they have a necessary connection with the production of assessable income. However, expenses incurred by most undergraduate and many postgraduate students are not deductible. This is because those education expenses are being taken in the hope of a job, or of a better job, and not in order to earn income in an existing job.

How curious. Consider the following example involving two occupations, lawyer and truck operator, which have identical income streams. An individual who uses \$40,000 savings to pay fees upfront for four years of a law degree would not be permitted any tax deduction. This is because there is no necessary connection between the expenses and the income. As the judges see it, the connection between lawyer's income and expenditure on fees is a possibility, not a probability. However, if the individual used the \$40,000 to buy a truck to engage in transport then the outlay could be depreciated. Similarly, if the outlays had been on HECS payment on the one side and a truck on the other. This asymmetric treatment will bias investment away from education towards physical capital.

Thus, it has been the clear intention of tax legislation, interpreted by the courts, to restrict the deductibility, for income tax purposes, of university fees and the like.

With the advent of the HECS system, this clear intention was made very transparent. The treatment of HECS Repayments for tax purposes is contained in Section 82A (Deductions for Expenses of Self-Education) of the *Income Tax Assessment Act 1986* (as amended). This states:

82A(1) [Exclusion of first \$250 from sec 51] Where a deduction is, or but for this section would be, allowable to the taxpayer under section 51 in respect of a year of income in respect of expenses of self-education, the deduction, or the aggregate of the deductions, so allowable to the taxpayer in respect of those expenses shall not be greater than the amount by which the net amount of expenses of self-education exceeds \$250.

82A(2) [Definitions] In this section:

“educational assistance” means amounts (other than amounts in the nature of an allowance for maintenance or accommodation) payable under a scheme for the provision by the Commonwealth of assistance for secondary education, technical or tertiary education, or post-graduate study;

“expenses of self-education” means expenses necessarily incurred by the taxpayer for or in connection with a prescribed course of education but does not include:

(a) a payment made to an institution of higher education to which Chapter 4 of the Higher Education Funding Act 1988 applies in respect of a contribution payable under that Chapter; or....

The operational significance of this is that unless a course of education is required by an employer, education fees are not allowed as deductions from taxable income.

Various arguments have been advanced for allowing HECS repayments and other expenses of self-education as deductions from taxable income. Equally, arguments have been advanced for not allowing HECS repayments as deductions from taxable income.

Arguments for the Status Quo: HECS not deductible; fees not deductible as capital expenses

The first argument is that higher education participants are the recipients of generous public subsidies. This argument, of course, fails in the case of students paying full fees - they receive no subsidy - but it could apply to HECS-liable students. Allowing HECS repayments as a tax deduction would do no more than increase the value of this subsidy.

The validity of this argument depends largely on the extent to which a subsidy is provided to higher education participants. This issue is discussed later. At this point, however, it is pertinent to note that the HECS contribution for a Law degree, at \$5,500 per year for a full-time student, amounts to approximately 85 percent of the notional sum received by a university for this type of student. Similarly, the HECS charge for an economics degree, at \$4,700 per year for a full-time student, amounts to 72 percent of the notional sum received by a university for this type of student.

Consider what the failure to allow deductions for educational expenditures from taxable income over the period in which they contribute to earnings means. A student who graduates with a three-year degree in economics will have accumulated a HECS debt of \$14,100. The University will have received around \$19,500 from the Government to provide the educational services received by the student. On the face of it there appears to be a public subsidy of around \$5,400. But this is an illusion caused by the discriminatory treatment of educational expenditures under current tax law. The student described above would be, on average, just as well off with a HECS debt of the full cost of \$19,500 and being allowed to deduct this from income on a depreciation schedule at a tax rate of 28 percent.¹⁰ Of course, the typical graduate will face marginal tax rates in excess of 28 percent, implying a preference for paying the full cost with a depreciation allowance over the current arrangements.¹¹ Clearly there is no

¹⁰ Bentick (1997) explores an indirect alternative to tax deductibility, which is to vary the ratio of HECS fees to cost of course. He also stresses the significance of forgone earnings, especially under a progressive tax system.

¹¹ As the fees for the degree are written off according to a depreciation schedule in the future, the present value of the deduction will be less than implied here. In addition, the "service fee" on HECS means that a fee of more than \$19,500 would need to be charged to cover resource costs of \$19,500. We ignore these

real subsidy to many courses provided in the tertiary sector. Indeed, it would appear that, when assessed against the tax treatment afforded individuals who invest in physical capital, and making allowance for the existence of some externalities that warrant a subsidy to higher education, students are being asked to pay more than the cost of their courses in many areas. These students have a right to ask the government of the day why this is so.

The second argument against the deductibility of HECS repayments is that because non-pecuniary benefits from education (*e.g.* the “prestige” associated with being a degree holder, the perks such as travel and a favourable work environment associated with the higher level positions open to the better educated) are not taxed, an adjustment to the tax deductibility of the education expense is required. These pecuniary benefits are difficult to quantify, thereby precluding an effective assessment of the validity of this argument.

A third argument is that, through the payment of pensions and provision of various welfare services, society already recognises the depreciation of human capital. These services are offered to all, however, regardless of the level of educational attainment, making this an argument of dubious value.

A final argument is that the concept of depreciation implies that the asset loses its income-producing potential. Many argue that general skills learned through formal education retain their currency throughout the working life of the individual and that provision for depreciation is therefore inappropriate. An opposite view is that the rapidly changing work environment renders many skills obsolete within a few years of acquisition. Some information on the likely magnitude of depreciation can be inferred from the shapes of age-earnings profiles. As is usually the case when indirect evidence has to be relied upon, there is a high degree of dispersion in the estimates. Trostel (1993, p.335), which is widely regarded as a benchmark study, opts for a base case of 4 percent per annum over the lifetime. In the simulations presented in Section 6 below, a 5 percent rate is used over a 20-year time period in the base case scenario.

Arguments against the Status Quo

Education is an investment enhancing a person’s future earnings prospects. It should be treated for tax purposes in the same way as physical capital. For physical capital, interest charges on borrowings are tax deductible, and the asset may be depreciated over its working life. Because educational expenditures are not treated in a similar manner, the tax system discriminates against individuals whose earned income represents in part a return on investment expenditure in ‘human capital’. As was argued earlier, asymmetric tax treatment will bias investment away from education towards physical capital.

complications here to permit emphasis on the fundamental principle advanced in this section. Calculations that incorporate these considerations are presented in section 6.

The failure to apply the principle that the cost of acquiring an income should be allowed as a deduction from taxable income to income earned through personal exertions is widely viewed as a major inconsistency in the tax system. Goode (1962) is an early writer who gave an extensive analysis of the subject. He argues that “The logic of the net income tax system seems to imply that persons who make expenditures for education that increases their earning power, or that is intended to do so, should be permitted to capitalise these outlays and write them off against taxable income through depreciation or amortization allowances” (p.284). Goode argues that the income tax discrimination is greater the higher the marginal tax rate, is a more compelling argument the higher the course costs, and impacts more on courses of study with lower subsidies. This is a particularly poignant argument in Australia now that the level of HECS has been increased and differential HECS has been introduced.

Goode suggested that educational expenditures should be capitalised and written off against taxable income over the period in which they contribute to earnings (p.292). As this is administratively complex, a shorter period was proposed (Goode suggested 20 years, but 10 years may be more appropriate. That there is already a structure for the recording of HECS liabilities and repayments will reduce the administrative problem). The shorter period can also be justified with reference to the tax treatment of Research and Development expenditure: subject to certain conditions (*e.g.*, thresholds of expenditure) Research and Development expenditure is immediately deductible at the accelerated rate of 125 percent. In addition, as earnings for many graduates are relatively low in the first few years after graduation, Goode suggested that there could be a moratorium before the deduction was applied.

Steuerle (1996) has a related argument for allowing educational expenditures as deductions from taxable income. He argues that on-the-job training and earnings forgone during periods of formal study are immediately expensed, the former by the employer and the latter being implicitly expensed in that the earnings forgone would be taxed if the individual had been working rather than in school. Also, Steuerle argues, there is no taxation on the value of education benefits obtained at cost to the public purse, thereby relatively disadvantaging individuals making direct contributions for education. “The most practical means of moving toward greater equality of tax treatment, therefore, is to allow expensing for other human-capital investments” (Steuerle (1996, p.356)).

The distortions under consideration in recent research also are associated with the progressivity of the tax system. The salient feature of a progressive tax regime is that the marginal tax rate is low when investments are made, and high when returns are received. The implicit expensing of the educational expenditures (in the form of non-taxation of forgone earnings) therefore confers a smaller reduction in cost than benefits are reduced by.

4.2 Equity Considerations

Australian society has generally accepted that no individual who satisfies tertiary entrance requirements should be denied a tertiary education on the grounds that he/she has inadequate access to finance. This is sometimes discussed in terms of individuals having a right to education. It is a principle that has provided the cornerstone of much government policy, and

was fundamental to the recommendations of the Wran Committee (1988a). In practice, this equity consideration means that society is prepared to pay for the education of the poor from taxes imposed on the rich. Means-tested scholarships or vouchers would be appropriate to meet this policy goal. AUSTUDY is an example.

From the economist's perspective, whether there should be redistribution from the rich to the poor in this manner depends on the views society holds concerning distributive justice. These might be appropriately determined in political circles.

There are, of course, other ways of looking at this matter. Consider the system of income taxation in Australia. This taxes wages when realised. An accrual-based income tax system would tax income when it accrues, that is when the potential is created. An accrual-based system is sometimes termed an "ideal" income tax (see, for example, Kaplow (1996)). What is important for the present argument is that the human capital (or life's chances) that one is born with is income that is taxed at birth under the ideal, accrual system (while there are obvious practical problems with taxing human capital at birth, proxy accrual taxation systems can be constructed). Comparison with a realisation system where the returns to human capital are taxed when realised reveals an imputed interest component under the latter system due to the different time profiles of tax payments, implying a favourable treatment under the realisation system of individuals with greater initial human capital due to their richer socio-economic backgrounds. Subsidies to education that are (inversely) related to family income are a means of equalising life's chances where an accrual-based income taxation system is politically unacceptable or infeasible (or both).

There is concern that subsidies to tertiary education provide a transfer from the average taxpayer to tomorrow's rich; and that they therefore are inconsistent with distributive justice based on lifetime incomes. This would be the situation where across-the-board subsidies were paid (in excess of those needed for efficiency reasons). However, it appears that, if it is politically unattractive to re-distribute life chances by taxing initial human capital, a case can be made for subsidies targeted on low-income groups.

4.3 Public Provision of Education?

Economists contend that in cases like education where there are both private and public components of a good (*i.e.*, a mixed good) efficient provision of the good requires either public provision with a private contribution to cover the private component of the good, or private provision with a public subsidy to cover the public component. The funding system described above is essentially the former, while the voucher scheme advocated by Peter Karmel (see below) essentially converts the education system to one governed by all the forces associated with private provision.

Public provision is often argued to be insensitive to changes in patterns of consumer demand. It is also argued to be associated with cost inefficiencies. In the market place, competition forces market participants to produce at the most cost efficient levels. In the tertiary sector, while there are often pressures to reduce costs (*e.g.*, efficiency dividends, unfunded salary

increases), the cost of education is not technologically determined. Rather, it is simply the aggregation of historical funding decisions, tempered by current government policy. Hence, to have the university sector correspond more closely to a competitive market would require:

- (i) a superior means through which student preferences are reflected in the types of courses offered and the numbers of students enrolled in each sector;
- (ii) incentives for cost centres to provide courses in a cost efficient manner.

Under the current system, these objectives cannot readily be achieved. Consider a student who wants to study law but cannot gain a DEETYA-funded place at institution A, regarded as offering a superior law degree, but can at institution B which is regarded as offering a law degree of lesser quality than the rival institution. If offered a fee-based course at institution A, the subsidy available if the study is undertaken at institution B is not transferable. The current system places restrictions on the student mobility that is fundamental to the achievement of a competitive solution.

Moreover, the provision of the DEETYA-funded place at institution B may cause a reduction in the total level of education acquired. Peltzman (1981) questions the presumption that national expenditure on higher education would be lower if students were required to pay full-cost fees; lower, that is, than under the usual arrangements for publicly-subsidised places. The key to the argument is that public education subsidies have an all-or-nothing character, as was illustrated in the previous hypothetical example. Another example illustrates the point that public subsidies can decrease the quantity of higher education. Consider a student who, by attending either public institution, B or A, receives education costing, say, \$6,500 and of a particular quality. Some students attending the public institution, including this student, would have been willing to pay a full-cost fee of more than \$6,500 for this education. In particular, if the subsidised public place had not been offered, this student would have attended a private university and paid a fee of \$7,500, which is \$1,000 more than the cost of the public alternative. However, the student accepts the offer of the subsidised public place because the extra \$1,000 of education at the private institution, although worth \$1,000 to the student, would in fact cost the student a full \$7,500, because she would lose the public subsidy. In consequence, the total resources allocated to higher education has been reduced by the offering of this subsidised place.¹²

Symmetrically, there are students in public institutions who would prefer to receive a less-costly education if only they were given a cash grant equal to the cost savings. These 'low' demanders can offset, more or less, the 'high' demanders, and so the overall effect of subsidisation of public education is an empirical matter.

The argument does not depend on the presence of private universities. The student with the high demand is willing to pay for extra education; and pay an amount at least equal to the extra cost. That extra education could be offered at the public institution in which she has

¹² In technical terms, all-or-nothing offers distort the marginal price schedule away from marginal cost, by introducing a discontinuity. Our proposals remove that discontinuity.

enrolled. However, Australian public universities are currently not permitted to make such offers of extra value for extra money to publicly-subsidised Australian students.¹³ The package of reforms we advocate would eliminate the economic inefficiency caused by the all-or-nothing character of the offers of public higher education, without losing the advantages of equity and efficiency available through public policy in public higher education.

Public provision of education in Australia has historically been associated with concerns over the accountability of the education system to the taxpayer. This concern has heightened in the recent decade, and there has recently been a surge of contributions on 'performance in higher education'. A theme of these contributions has been that governments and universities can and should devise ways of assessing whether departments are delivering quality programs. This is reflected in moves within some institutions to reward quality teaching in their inter-disciplinary allocation of resources. Various possibilities have been suggested, including peer review, course evaluations by students and departmental teaching portfolios. All are administratively burdensome and contentious.

An alternative is to resort to market forces. Market forces provide both an incentive to develop competitive edges (*i.e.*, an incentive to succeed in the form of additional students or higher prices and hence more resources) and a disciplinary device against poor performance (*i.e.*, a sanction in the form of declining enrolments and hence fewer resources). If students have some freedom to move across institutions (prior to enrolling and also during later years of study) and are offered a range of programs differentiated by price and quality, then they will choose the program that offers the best value for money. Institutions/departments that face a loss of students will need to address the problem by either lowering price or raising quality (or both). Institutions that face an excess demand for their courses would soon realise that as competitors will be reacting to the shift in student demand, the circumstances that gave rise to the competitive edge will be only temporary and that further innovations will be necessary to maintain their advantage. A high level of performance monitored automatically by the market is an outcome of allowing competition. The market can certainly provide this service far cheaper and more effectively than university or government administrators in a regulated environment.

There is also the possibility that the current system of public provision of higher education provides the wrong mix of graduates. This possibility was raised by Clare and Johnston (1993, p.79). One of the main reasons for this is that the market signals that would attract students to disciplines that are in demand in the market place are distorted by governments and university administrators. There are two main and related distortions. First, higher earnings for a skill in excess demand are the market signal required to attract students to acquire that particular skill. To differentiate HECS charges on the basis of expected labour market earnings is to dilute that signal.

¹³ From 1997, Australian public universities will be able to charge publicly-subsidised students for some extra services. This only goes part way to remove the distortion outlined, because they are restricted to 'ancillary' services, excluding any 'compulsory requirements' of courses.

Second, rates of subsidy differ enormously across disciplines. Students in some higher cost courses (*e.g.*, Science with a weight of 2.2 in the RFM) currently pay the same HECS as students in Administration, Business and Economics (weight of 1.0). Hence, if the subsidy per year to an economics student was of the order of \$1,800, then that to a science student would be over \$8,800. Such a large subsidy to the latter student would serve to attract more students to science and subsequently depress salaries for science graduates. Given this scenario, there will likely be pressure in the future to increase the subsidy even further.

Providing a subsidy to each student that is a set percentage (*e.g.*, 50 percent) of course costs is one way of correcting the current anomalies. A uniform percentage subsidy is the form of public contribution advocated by the Wran Committee in 1988. It also underlies the voucher proposal recently proposed by Karmel (1996) and the recommendations of the Productivity Commission (1996).

If there are emerging national priorities (*e.g.*, a shortage of trained scientists) then these can be addressed by the provision of scholarships or cadetships. These scholarships could be funded by government, industry or universities, singularly or in partnership. To be cost effective, however, the scholarships should be carefully targeted on particular fields: scholarships tenurable in broad fields of study would serve no useful purpose.

Vouchers, or the competition that would emerge from a SuperHECS proposal, are possible solutions. Under SuperHECS, the margin is exposed to competition, and this is sufficient for the benefits of a competitive system to emerge.

5. Proposals

5.1 Determining the Level of Public Subsidy

The most frequently encountered justification for public funding of the higher education sector is that education is a mixed good with both private and public benefits. Taking account of the public benefits (*i.e.*, the positive externalities) requires a contribution from the public purse. The Productivity Commission (1996, p. 98), for example, concludes that a significant public contribution to the cost of higher education is warranted on account of the spillover benefits to the community. Our review of the literature lends support to this conclusion. However, we doubt whether the differential subsidy across discipline types that characterises current funding arrangements can be justified on the basis of differential rates of production of externalities across disciplines. Such subsidies have a significant potential to lead to the production of a mix of graduates inconsistent with the needs of the economy. Unfortunately, the very nature of the externalities prevents the market placing a value on them, and therefore makes the setting of the level of subsidy difficult. We are left with the proposition of Mark Blaug (1966, p.538) “We can subsidise what we like to subsidise. But we must make sure that we are subsidising for the right reason”.

At a time when the government is engaged in a major savings task while wishing to build a strong, internationally reputed university sector, we doubt that the existing levels of subsidy to the tertiary sector are given for the right reason. There are, however, few benchmarks to guide the setting of the level of subsidy. The current subsidy to an economics degree is under 25 percent. The current level of subsidy to a science degree is over 60 percent. We are prepared to assert that there is no evidence to suggest that the externalities generated in these two disciplines depart significantly from each other or from the externalities generated in other disciplines. We believe that setting the level of subsidy to all courses at a uniform rate (as a percentage of average DEETYA determined course costs) would be consistent with the primary reason for providing subsidies, namely to cover the value of externalities associated with the teaching functions of universities. It would, under the integrated package outlined here, provide the basis for a viable tertiary sector. An integrated package that modifies the direct public subsidy to the teaching functions of universities to remove the distortions associated with the current differential subsidy, extends the HECS charge scheme, introduces deferred tax deductibility for HECS repayments and expands research funding, has merit.¹⁴

It would appear that a uniform operating grant subsidy equal to 50 percent of average DEETYA determined course costs would permit the introduction of competitive pressures into the tertiary sector and its survival, in the words of Freebairn, Porter and Walsh (1987, p.115), “in something like its present form”. Within limits, the costs of teaching at a university are a matter of choice, not necessity; savings might be made in some courses of study as institutions react to the changed circumstances. A subsidy of less than 50 percent of the current average DEETYA determined course costs may be possible.

A consequence of this proposal is that the existing extremely high rates of subsidy to high-cost courses will be moderated more than the rates of subsidy to low-cost courses (which would actually be increased) and, consequently, there will be shifts in the relative attractiveness of various courses of study. As the total costs of a tertiary education will still, for the majority of students, be dominated by forgone earnings, the impact of the reduction in the level of public subsidy will not be as dramatic as it may first appear. But changes in the relative attractiveness of courses of study will occur, and such changes will always be the case when existing distortions are being corrected. If these changes result in a supply of graduates inconsistent with market needs, then we would expect to see adjustments in salaries for the various occupations in order to counter-balance the changes. The anticipated objections from some quarters will reflect no more than concern over the erosion of “favoured status” under current financial arrangements.

If there are emerging national priorities (*e.g.*, a shortage of trained scientists) then these can be addressed by the provision of scholarships or cadetships. These scholarships could be funded by government, industry or universities, singularly or in partnership. To be cost effective, however, the scholarships should be carefully targeted on particular fields: scholarships

¹⁴ Our recommendations would seem to satisfy the desiderata outlined by the Productivity Commission (1996, p. 97), that the funding scheme should “... give students signals about the relative costs of courses, and thereby make costs, as well as future benefits, a consideration in course choice. It would also provide better information to universities on students’ valuation of courses in the light of those costs.”

tenurable in broad fields of study would serve no useful purpose. The number of scholarships and the eligible fields should be determined on an annual basis.

Recommendation One: Operating Grants at 50 percent

As part of an integrated package of reforms to the university sector, the public operating grant should be set at a uniform proportion of average DEETYA determined course costs. An operating grant equal to 50 percent of cost would probably be sufficient to meet perceived government objectives of achieving cost savings and maintaining a viable university sector.

Recommendation Two: Specific Scholarships

Scholarships should be provided to accommodate temporary shortages of specific skills. These scholarships need to be carefully targeted on the skill in shortage. The number of scholarships and the eligible fields should be determined on an annual basis.

5.2 Vouchers?

If there is to be a public operating grant subsidy to universities equal to 50 percent of average DEETYA determined course costs, the mechanism through which this is paid needs to be determined. There are two candidates for consideration here: vouchers allocated to students and funds allocated directly to universities.

A voucher is a government grant that can only be spent on a particular good. The basic ideas behind educational vouchers are that education is a mixed good, that is it has both private and public good aspects, and a voucher can take care of the public good aspect. Voucher schemes differ on three broad counts: finance, regulation and information.

In terms of finance, the major issues are the value of the voucher and the flexibility of institutions to charge more than the voucher. The voucher could be the same absolute value for all students, so that students who enrol in high-cost courses may be required to pay the additional cost. The voucher could be compensatory, in that it is (parental) income related. The voucher could also be cost-based. In this situation, a student enrolling in an English course would get exactly the same voucher as a student enrolling in an Economics course (according to the RFM). However, a student enrolled in a course that DEETYA assessed as costing more to teach would receive a higher valued voucher. From a practical perspective, the value of the voucher could be set at a fixed percentage (*e.g.*, 50 percent) of DEETYA assessed course cost. The voucher could also be achievement based, in that the value of the voucher is related to academic achievement. This could be a graduated scale, with higher values for each decile in the tertiary entrance examinations or for grade performance beyond the first year of tertiary studies. Achievement-related vouchers might also simply mean that

the vouchers would be available to the “x” best students, where “x” is the total number of places that governments decided to fund.

Institutions might be given permission to charge more than the voucher. Discounts might be applied to the voucher, however, in this situation. For example, Parish (1987) argued that secondary schools that charged fees would only receive a fraction of the face value of the voucher (he suggested 70 percent of the face value). Karmel (1996) suggested that tertiary institutions charging fees above a threshold might be excluded from the HECS collection mechanism for the extra-marginal fees. In a situation where institutions were expected to charge more than the value of the voucher to cover average operating costs, such a discount scheme would be inappropriate.

Regulation may be necessary in a voucher scheme to ensure equality in society and to ensure that the public good aspect of higher education funded via the subsidy is actually delivered. Ratings along the lines of the Committee for Quality Assurance in Higher Education or the approach developed by the Higher Education Funding Council in England (see Anderson (1996, p.7-9)) might be suitable.

Information is generally held to be important to voucher schemes in that the schemes are supposed to give students greater choice, and students require an appropriate information set on which to base their choices. Levin’s (1991, p.144) remarks provide a useful guide here: “For example, a reading of college catalogs suggests that from the largest state universities to the smallest liberal arts colleges there is a common descriptive vocabulary that includes references to ‘academic excellence, outstanding faculties and facilities, and concern for the individual student’”. Where institutions respond to market forces by offering a wider variety of courses, students may have difficulty in assessing quality where there are promotional distortions.

Against this background, a recent suggestion for vouchers may be examined. Thus, in a paper entitled ‘Policy Perspectives on Higher Education Financing: An Alternative Mechanism’, Peter Karmel proposed a scholarship/voucher scheme for higher education in Australia. He envisaged the number of vouchers either being set by government as a fixed number (and being allocated largely on the basis of merit, but with special cases being accommodated) or being available to all students above a given percentile in the ability distribution, with the number taken up being determined by conditional demand. The scholarships would be for a limited tenure (such as five or six years of full-time study or the equivalent of part-time study), and vary in value according to the course undertaken. The RFM could be used as a basis for establishing the relative value of the vouchers. Institutions would be free to charge a fee above the scholarship value, and HECS arrangements would be available for the collection of the fee (subject, however, to a maximum on the margin imposed). Individual institutions could admit full fee-paying local students, subject to satisfying the institution’s entrance requirements. Individual universities would decide the total student intake and the mix across courses of the intake.

Karmel argued that his scholarship package is market-oriented. Given that students rather than institutions were being funded, institutions would have to compete for students by

offering quality products at attractive prices. Students would be able to compare products and fees charged across institutions. The outcomes predicted under this proposal include (Karmel, 1996, p.9) diversity among institutions in terms of the nature of courses, the levels at which they are pitched, the size of the institutions, the facilities available, the emphasis and ethos of the institution; and greater autonomy to management.

Karmel's scheme was built around students receiving a voucher for a fixed percentage (say 50 percent) of course costs, regardless of the course. For a Law student, the funding might be HECS of \$3,250 and a Voucher of \$3,250; for a Mathematics student, HECS of \$4,000 and a Voucher of \$4,000; for a Science student, HECS of \$6,750 and a Voucher of \$6,750.

This cost-sharing arrangement plays a pivotal part in Karmel's scheme as well as our own. Thus, Karmel argues (p. 12) that imposing a higher liability on students in more expensive courses would reduce the chance of a blow-out in the costs to the Treasury from a shift to more expensive courses (which often have quotas). In addition, Karmel notes "That fees should reflect costs is sometimes disputed on the grounds that it would discriminate against students wishing to enter expensive courses like science and engineering and reduce the output of graduates in these fields. However, a shortage of such graduates would be reflected in their remuneration; this would make the fields attractive in spite of their higher fees" (Karmel, 1996, p.12). This is the way the market works, a fact that is, unfortunately, not recognised under current arrangements for Commonwealth funding of universities.

Under current arrangements, some high cost, low income courses, such as 'other languages' are in the lowest band for HECS, presumably because of the low income prospects. But by having low current costs to students, the government is effectively encouraging an artificially high number to graduate in the area. This relatively high supply will, other things being equal, further depress graduate salaries in the area. Under Karmel's scheme, students will respond to the higher actual costs by moving to other areas of specialisation. The fewer graduates for language programs will lead to a bidding up of salaries for language graduates. If these salaries are bid high enough, additional students will be attracted to languages.

An advantage of Karmel's scheme not considered by Karmel is that it makes the subsidies to different courses of higher education quite transparent. And presumably this would bring pressure to bear on governments to justify the extraordinary subsidies to some courses of study if these were to continue (a prospect argued against by Karmel who advocated a uniform percentage of cost subsidy). At the same time, it would make tertiary financing arrangements more transparent to academics, and hopefully force university administrators to be accountable for the cross-subsidisation that occurs across courses within institutions.

Under Karmel's scheme and ours, institutions that believed they had popular courses could charge a higher fee for these courses. Hence, there appears to be little reason why the current level of HECS of \$5,500 for law could not be maintained, or even increased, by some institutions (provided suitable equity scholarships were offered if up-front fees were required). An institution that wanted to attract students to a science program could charge a HECS lower than \$6,750, and either provide a lower-cost science program, or cross-subsidise using endowment income or base monies from other programs. Such a lower cost science program

may be possible as costs of courses are, within limits, a matter of choice within the university funding environment.

There are some similarities in outcome between Karmel's voucher scheme and ours to fund universities directly on the basis of actual student load. Under the voucher scheme, a student will attempt to gain a place in a particular course at an institution and the student is funded at 'x' percent of current average course cost. This amount is then passed onto the institution, notionally by the student (but in the form of a voucher that is redeemed by the government). Eligibility for the voucher is pre-determined. For example, the government might issue 100,000 vouchers. The voucher scheme relaxes the controls on student numbers at particular institutions effected through profiles negotiations and in this sense permits a greater role for market forces.

Funding universities directly on the basis of actual student load rather than planned student load can be regarded as an *implicit voucher scheme*. With this implicit arrangement, a mechanism through which the total number of government subsidised places is determined needs to be devised. One possibility, raised by Karmel (1996), is that all students above a given percentile in the tertiary entrance exams (or their equivalent) could be funded at the university of their choice (subject to satisfying the entrance requirements of the institution). Under this alternative, institutions could be directly funded on the basis of actual student load at (say) 'x' percent of standard average course costs (as per the RFM). The difference between the contribution by the government and average course costs would need to be made up in the same way as under a voucher arrangement (see the next section).

If the voucher scheme and the implicit voucher scheme provided by direct funding of universities on the basis of actual student load deliver the same outcomes, is there any basis for choosing between them? We suggest that there are three main matters that need to be considered.

First, there is the issue of budget predictability for the government. With a voucher scheme, government controls the total number of vouchers issued, and with reasonable projections on the distribution of student preferences across disciplines, has control over the total funds required for the higher education sector. With the alternative of funding on the basis of actual load, the implicit voucher scheme, there is less certainty about the numbers enrolling in any given year and hence less control over the funding required. On this basis, therefore, one might favour the direct, explicit voucher arrangement.

The second issue is the costs of administration under each of the funding mechanisms. It would appear that the transactions costs of the voucher scheme will be larger than that of direct funding to universities. On this ground, therefore, there is preference for the implicit voucher scheme.

Third, how will the value of a voucher be set so as to enable students to choose subjects? If a particular student is provided with a \$3,250 voucher for an Arts degree, will his or her choice be restricted to the low-cost courses? Any reasonable answers to these questions quickly lead us back to funding on the basis of actual student load.

It would appear that the control over the claims on the public purse under an implicit voucher scheme would be easier to implement than it would be to reduce the (higher) transactions costs under an explicit voucher scheme.

Recommendation Three: Implicit Vouchers

The public operating grant to higher education should be paid directly to universities on the basis of actual student load. A minimum standard for entrance to universities will need to be set to effect a control over the budget allocation to the higher education sector. Universities should be permitted to set higher standards for entrance if this is consistent with their mission.

5.3 SuperHECS

If the subsidy to higher education is to be set at no more than 50 percent of average DEETYA determined course costs, the question needs to be answered of how the balance of course costs will be met. For publicly funded students, an extension of the current HECS charges, termed SuperHECS, is recommended.

SuperHECS is a method of supplementary funding for universities advocated by Pincus (1996). Under Pincus' original SuperHECS proposal, each university would be able to add its own amount of HECS-able fees to the government-determined charge. Pincus noted that "The scheme need not give carte blanche to the universities. For example, the government may insist that the level of fees not exceed some nominated amounts or nominated fractions of HECS; it may insist that merit scholarships be put into place by any university choosing to impose SuperHECS fees; government may wish itself to institute an equity scholarship scheme".

In the current package of reforms to tertiary education funding, SuperHECS charges could be seen as encompassing HECS charges. Hence, HECS would disappear and the level of fees for each course would be set by the university itself. For each publicly subsidised student the institution would have two sources of funds: the public subsidy and the revenues generated by SuperHECS.¹⁵

¹⁵ The National Commission of Audit (1996, p. 33) recommended that "The Higher Education Contribution Scheme (HECS) should be available to students attending universities, TAFEs or other accredited institutions. It should continue as an income contingent loan scheme, with students applying through their institution. HECS should be available to cover the difference between course fees and scholarship grants." A similar set of recommendations came from the Productivity Commission (1996, p. 99): "... giving universities the power to set fees, and at the same time moving away from funding through block grants, to more use of portable, direct student subsidies. The per capita subsidy could be a fixed dollar amount or a percentage of course cost. ... up-front fees and assistance to disadvantaged students through targeted fee rebates and/or means tested scholarships or loans".

The advantages of this approach are considerable. First, the fees levied by the institution for publicly subsidised students are collected in the form of an income-contingent loan. They therefore satisfy the efficiency and equity criteria addressed previously. On the basis of Australian experience with HECS, SuperHECS should have minimal equity implications. Second, SuperHECS allows university administrators substantial freedom to set fees that reflect student demand for the quality of product that is produced. Third, SuperHECS will provide university administrators with incentives to tailor the quality of products to student demand.

The consequences of the introduction of SuperHECS should include: (i) a range of prices across institutions for the same type of degree; (ii) variations across institutions in the quality of any given degree; (iii) students having choice in terms of the price-quality combinations they wish to purchase.

The quality differences that are possible would be of two types. First, there are existing quality differentials that are reflected in queues. These arise from the quality and quantity of existing academic staff, locational advantages and the advantages bestowed by history. Second, there are changes that might be made to course offerings, student services or facilities as a consequences of universities having control over prices. For example, some universities might promote a higher level of computer usage in their degrees, others might focus on ancillary services like study skills support and essay writing workshops, while basic changes to class size, contact hours and course content might be the focus of other universities. What is important is that these need not be a re-allocation within a given budget as is the present situation: rather the budget can be expanded through a higher level of SuperHECS if this is considered desirable and feasible by the particular institution. Alternatively, if a 'no-frills' education is being demanded by the market, then a university could structure its degree programs to cater for this need.

SuperHECS allows universities to respond to market opportunities and to attempt to lead the market by developing new products that will give the institution a competitive advantage. Decisions on fees are decentralised to a level that is close to the market.

Recommendation Four: SuperHECS

Universities should be permitted to levy HECS-able fees called SuperHECS to supplement the public operating grant to higher education. Universities should have full control over the level of SuperHECS.

An issue that needs to be addressed when using the HECS mechanism to collect SuperHECS is the amount of revenues that universities could expect to collect from each dollar of fees levied, and the time period in which the revenues would be collected. The main reason why collection of fees for higher education has been through the HECS mechanism to date is to meet various equity objectives (Chapman (1996)). The same motivation applies to SuperHECS. Equity should not be the primary responsibility of universities. (Each university has responsibilities in this regard, but the government has the overall responsibility.) Hence, the cost of operating an income-contingent loans scheme should be viewed as a cost of

meeting an equity objective and should be borne partly by the pool of borrowing students (as is proposed in Barnes and Barr (1988)), and partly by government (as is the case with the current HECS system).¹⁶

Currently, any student paying their fees up-front pays only 75 percent of the HECS charge. It would be appropriate, therefore, to give universities an amount similar to this 75 percent figure for all fees levied.

Recommendation Five: Unchanged Borrowing Fee

All university fees should be paid through the HECS system and universities should be paid 75 percent of the value of any HECS-able fees levied in the year the SuperHECS is levied. The 25 percent difference between student payments and university receipts is viewed as a service fee in lieu of interest, risk spreading and administration costs.

Some local students may not be eligible for a voucher or publicly funded university place and yet meet the entrance requirements for a particular university. This situation might arise where the government limits vouchers or publicly funded places in some courses. Such students would obviously have to pay the full cost of their education. We feel, however, that while they should be required to pay an amount equivalent to the public subsidy 'up-front', they should have access to the HECS system for payment of the additional fees levied by the university in the form of SuperHECS.

We are not convinced that there is any great need to provide equity scholarships simply because some local students are admitted to an institution on a 'full-fee' basis. There would, however, be merit to allowing these students access to a scheme like the AUSTUDY Supplement should the required 'up-front' payment be inhibiting.¹⁷

Recommendation Six: Non-DEETYA Places

Institutions may offer full-fee places to local students who are not eligible for a publicly subsidised place at their preferred university. The full-fee should be seen as comprising an 'up-front' payment equal to the public operating grant for their particular course and the SuperHECS fee for the course. The 'up-front' fee should be

¹⁶ We endorse the proposal of the National Commission of Audit (1996, p. 33) that consideration be given to securitising HECS (and SuperHECS) debt. If the service charge is not sufficient to make the debt saleable, then there is still a case for additional public subsidy on equity grounds (on the adequacy of the service charge, see Section 7 below). Note, however, that the adoption of an accrual-based accounting system by government would reduce the advantages to the Treasury of securitisation of these debts.

¹⁷ According to Clotfelter (1996, p. 266, n. 5), in 1991/92 the average ratio of scholarships and fellowships to all tuition and fee revenues was 15.3 percent for U.S. private universities and colleges, and 8.7 percent for public institutions. These are the differences between listed fees and fee collections, and not between costs and fee collections, particularly for the public institutions receiving public grants.

payable via a funding scheme like the AUSTUDY Supplement operated by the government or the institution.

5.4 Tax Deductions for Educational Expenditures

Under the integrated package of reforms to higher education outlined, the subsidy to tertiary education is set at a level that may appropriately reflect the externalities generated by the higher education sector. Students will be liable for fees amounting to 50 percent or more of average course costs. As repayment of these fees is income contingent, equity considerations and the inefficiency aspects of capital market imperfections are addressed. There is also the matter of whether the fees will discourage individuals from attending universities.

As noted previously, the direct costs of education are for most students less than one-third of the total cost of acquiring a university degree, and hence the effect of changes to university fees should not be exaggerated. Still, the changes to fees that would emerge under the revised public subsidy of no more than 50 percent of course costs would be considerable in high-cost courses. Because of the presence of other distortions in the labour market, the fee structure outlined would have some adverse consequences on enrolments in higher education. A major reason is that investment in education is discouraged by the current tax system that dramatically favours investment in physical capital to the detriment of investment in human capital.

Permitting educational expenditures to be allowed as a deferred deduction against assessable income is an essential component of the reform package advocated. This would place investment in human capital on the same footing as investment in physical capital (Goode (1962); Kaplow (1996); Steuerle (1996); Trostel (1993)). On a level playing field, investment in human capital will not be discouraged relative to investment in physical capital.

The main basis for this reform to the tax treatment of expenses for self-education is that by setting the public contribution to tertiary education to no more than 50 percent of average course costs, the public subsidy will most likely do no more than cover only the externalities associated with tertiary education, thereby removing the primary reason for not allowing education expenses as a tax deduction. It follows, therefore, that not all expenses for self-education would then be permitted as tax deductions: only those for courses of study where there is no public subsidy other than those necessary to internalise externalities.

It can be noted that our advocacy of the removal of the discriminatory treatment of educational expenditures is not without precedent. The matter was part of a series of proposals advanced in the U.S. by President Clinton in 1996. His proposals had two arms. First, he suggested a \$1,500 refundable tax credit (*i.e.*, if the family paid no tax it would receive a \$1,500 tax refund) for the first two years of post-secondary education. Second, a \$10,000 per year tax deduction was suggested for the cost of college and vocational education for families with incomes up to \$100,000.

This scheme was criticised by Gary and Aldona Robbins (1996) on the grounds that it “delivers very little bang for the buck”. Thus the problem according to these critics was that the President’s proposals gave tax relief to individuals who would have gone to college even without the tax relief. This comment is valid in general, but is not argued from a theoretical ideal. It has been argued above that the current treatment of educational expenditure is discriminatory and that equality with the treatment afforded investment in physical capital calls for a reconsideration of the present situation.¹⁸

Recommendation Seven: Taxation

SuperHECS repayments net of the 25 percent service fee and all ‘up-front’ charges should be allowed as a deferred deduction against taxable income attributable to the investment in human capital. From a practical perspective, we recommend a twenty-year write-off period.

Allowing education expenditures as a deduction against taxable income is a major change, and many fine details will need to be debated. We are advancing our recommendation to promote this debate in Australia. The issues that require further consideration will include the following. First, is the deduction to be allowed for the student or to the student’s family as under Clinton’s proposal? This becomes a practical matter where fees are paid ‘up-front’ by the student’s family. We suggest that the deduction should always be for the student.

Second, the issue of whether the deduction should be confined to SuperHECS repayments or extended to other educational expenses (books, service charges, required field trips) needs to be considered. An extension of the current \$250 limit to a higher value (in line with medical expenses) for these other expenses might avoid the record keeping complexities that would arise if all items were to be allowed as deductions.

Third, our nomination of a twenty-year write-off period is arbitrary. The pros and cons of alternative arrangements for amortisation need to be fully worked out. Our comparison of the effects of ten-year and twenty-year amortisation periods indicate that this aspect of the reform package is not crucial.

Fourth, there is the matter of whether fees paid at educational institutions other than universities be allowed as tax deductions. This may require the government to establish a list of registered providers of education services, with payments to all registered institutions qualifying for amortisation as outlined above.

Fifth, if education expenses are allowed as a deferred deduction against taxable income and the government reduces its direct subsidy to the higher education sector to yield a reform package

¹⁸ The point here is that all practical forms of assistance ‘subsidise’ infra-marginal as well marginal individuals or organisations. Attempts to confine assistance to the marginal responses have their own problems of equity and efficiency (*e.g.*, that they can produce sharp rises in effective tax rates; or stimulate wasteful, ‘subsidy-seeking’ behaviour).

that is neutral in its fiscal impact, it may appear that the objectives of the reform package outlined above will be thwarted. This is not the case, however, as the value of the tax deduction will vary across course types and according to the enrolment characteristics (full-fee versus holder of a publicly subsidised place) of the student. Our suggested treatment of educational expenses is a preferred alternative to attempts to overcome the distortions associated with this aspect of the tax system through adjustments to the rate of subsidy to higher education.

What is required at this stage is acceptance of the basic principle.

5.5 Research

The Research Quantum is currently slightly less than five percent of the total operating grant. Its distribution is via a performance oriented mechanism. Change to the Research Quantum is required for several reasons. First, while that was no major concern expressed at the relative size of the Research Quantum when the Relative Funding Model was introduced, the sum involved was calculated to reflect past practice, and so the Research Quantum does exactly that: it reflects the practices of the late 1980s. Expenditure allocation in an institution will respond to incentives. If there are incentives for research, cost centres will allocate a relatively greater share of their budget to research. If the research ethos in Australian universities has changed since the 1980s, as we suspect it has, then a revision to the amounts allocated under the Research Quantum is in order.

Second, the Research Quantum was initially constructed to support research activities other than those inextricably linked to higher degree research training, the costs of which were recognised in the teaching component of the Relative Funding Model. As there are increasing moves towards the provision of post-graduate education on a fees basis, there is an urgent need to revisit the joint product of teaching and research and devise an appropriate allocation of funding for all research activities. This task is beyond the scope of the current paper.

Third, there is a need to consider whether the type of university structure that might emerge under alternative levels of funding for research might be superior to the current situation in Australia. Of interest in this regard is the level and means of allocation of research funding in the United Kingdom. In the United Kingdom, approximately 20 percent of base funds is distributed for performance-based research funding (Anderson *et al.* (1996), p.59)). The criteria used to allocate research monies include the numbers of research students, research grant income and peer review of departments.

At this stage, what needs to be adopted is a set of principles. We propose the following.

1. The performance criteria suitable for each discipline may be unique due to circumstances peculiar to the discipline.
2. It is not appropriate to use performance criteria devised for one discipline to allocate monies to other disciplines.

3. The allocation of research monies to broad disciplines should be done by DEETYA so as to equalise the marginal returns from the last dollar spent in each discipline. The twelve major Fields of Research currently recognised by DEETYA would be an appropriate level at which this principle could be applied.¹⁹ This may sound impractical, but output indicators are already part of the Composite Competitive Index. If they are regarded, in principle, as an acceptable quantitative indicator of output for the purpose of distributing the Research Quantum, then they should be regarded as an acceptable quantitative measure for the purpose of the research-output maximising allocation of research monies suggested here.
4. The allocation of research monies within a discipline should be by means of a formula specific to the discipline and/or by peer review. This formula might be a variation on the Composite Competitive Index.

Recommendation Eight: Research Allocation

The appropriate allocation of research monies across broad disciplines is to achieve the equalisation of the marginal returns from the last dollar spent in each discipline. The allocation of research monies within a discipline should be by means of a formula specific to each discipline and/or by peer review.

Recommendation Nine: Research Quantum Raised

The amount of monies available for distribution through the Research Quantum should be reviewed to take account of changes in the 1990s to the emphasis given to research at Australian institutions of higher education and the implications of the reform package outlined for the exclusion from the research quantum of the costs of research activities inextricably linked to higher degree research training.

6. A Feasibility Study

The integrated package of reforms to the financial arrangements for universities outlined above involves three major departures from the status quo. First, it has been argued that educational expenses should be allowed as a deferred deduction against taxable income. At present education expenses are not usually permitted as a deduction against taxable income. Second, it has been recommended that the public operating grant subsidy be set at a fixed proportion of average cost. At present the public subsidy as a proportion of average costs varies appreciably by type of course. Third, unlike the current arrangements, the fees levied in the proposed system are not linked to the income prospects in the various courses. We view

¹⁹ The twelve Fields of Research are: (01) Mathematical Sciences; (02) Physical Sciences; (03) Chemical Sciences; (04) Earth Sciences; (05) Information, Computer and Communications; (06) Applied Science and Technologies; (07) General Engineering; (08) Biological Sciences; (09) Agricultural Sciences; (10) Medical and Health Sciences; (11) Social Sciences; (12) Humanities.

the current situation where there is such a link as no more than a poorly disguised progressive income tax. It is more appropriate that income redistribution objectives of this nature be achieved through changes to the marginal tax rate. The fees actually paid under the proposed system, however, are related to incomes realised, as is appropriate under an income-contingent loan repayment scheme.

To determine the impact of our recommendations on the average student, various simulations were conducted. These simulations are based on the income profiles of employed graduates derived from the 1991 Census of Population and Housing. Age-income profiles for males and females were constructed from this source. The profiles for 1991 were adjusted for secular real income growth by applying a two percent compound growth factor. The 1997 repayment rates for HECS are used. In the simulations where depreciation of the capitalised value of the educational expenses is permitted, a straight-line write-off of the capitalised amount is allowed, with the write-off period being 20 years. A discount rate of five percent is used throughout.

The simulations are conducted for a three-year degree. Three costs levels are examined: a degree costing \$6,500 per year (\$19,500 for three years) which approximates the course types in the lowest-funded undergraduate cell in the Relative Funding Model (Accounting, Administration/Economics, Law and Other Humanities), a degree costing \$8,000 per year (\$24,000 for three years), which approximates the course types in the second undergraduate cost cluster in the Relative Funding Model (Behavioural Sciences, Education, Mathematics/Statistics, Other Social Studies) and a degree costing \$13,500 (\$40,500 for three years), which approximates the course types in the fourth undergraduate cost cluster in the Relative Funding Model (Engineering, Science and Surveying).

Table 1 presents the present values of payments under three models. The first model is where a student is charged an annual HECS fee of \$4,700 per year, or \$14,100 for the three-year degree. This is the HECS payment that a student doing Accounting, Mathematics/Statistics or Science would be required to pay. That is, the current arrangement imposes a uniform charge on these groups even though the cost of provision of the courses differs by a factor of more than two. We know of no other publicly provided or subsidised good where the consumption of the highest cost alternative is encouraged to the extent that it is in higher education.

The HECS fee may be paid on a deferred, income-contingent basis. Consequently, the typical student will attach a lower value to the repayments than the \$14,100 tax debit. When evaluated using the discount rate of five percent, the present value of the HECS repayments is \$11,900 for males and \$11,500 for females.²⁰ The lower value for females arises because the lower incomes of females imply a slower rate of repayment compared to males, and so the present value is reduced. Hence, the status quo may be described as follows: the typical

²⁰ The present value of the repayments is approximately 85 percent of the tax debit of \$14,100. In other words, a student would be indifferent between paying the \$14,100 according to the HECS repayment schedule, or paying \$11,900 up-front. This suggests that with the repayment schedule introduced in the 1996-97 budget, payment up front at a discount of 25 percent should be an attractive option for the average student with the cash and who has a five percent rate of time preference.

student outlays the equivalent of slightly less than \$12,000 in income-contingent payments. In return they gain access to an income-contingent loans scheme and are educated in a course costing \$19,500 if enrolled in the lower-cost group of subjects, \$24,000 if enrolled in the medium-cost group of subjects, and \$40,000 if enrolled in the higher-cost group. The rate of subsidy, therefore, is sizeable in the latter group of subjects.

The second model is termed a “Neutral” taxation model. This model mirrors what we consider would be a practical compromise on an ideal financing/taxation arrangement for higher education expenses. In this model, students are required to pay a fraction of the cost of their degree (varying from all the cost to only one-quarter in the scenarios presented here), and the fees must be paid ‘up-front’. To achieve this we permit the student to borrow from the government at a five percent rate of interest. This rate is relatively low, but is a practical level. The educational expenses, but not the interest on the debt, are deductible against incomes according to the depreciation schedule noted above. The interest payments are not allowed as a tax deduction in recognition of the relatively low rate of interest charged on the debt.

The present values of the payments for this fee regime are listed in the right-hand section of the table. Consider the first course that costs \$19,500. If students were asked to pay the full cost and they could borrow at a five percent real rate of interest to facilitate this, were allowed to depreciate the \$19,500 over 20 years and repay their debts according to the current HECS repayment schedule, the present value of the payments required (including the debt repayment, interest charges and the depreciation offset) would be \$14,700 for males and \$15,300 for females. If the government provided a 25 percent subsidy of the operating grant, the fee that the student would be charged would be reduced to \$14,600. The present value of the payments under the “Neutral” taxation regime would be \$11,100 for males and \$11,500 for females.²¹ The higher present value of the payments for females is due to their lower average income which implies a lower value of the tax deduction, and higher interest charges due to the slower repayment of the tax debt. These matters can be easily overcome if required: the lower value of the tax deduction by using a tax rebate scheme and the higher interest charge by replacing the interest charge with a service fee as under the proposed SuperHECS system.

Examination of the other sections of the table for the “Neutral” taxation arrangement reveals that as course costs rise, the present value of the payments by students rise. This is in stark contrast to many course comparisons under the current HECS arrangements, where the student contributions are invariant to changes in course costs (see the column headed HECS repayments). Introducing a system whereby demand may be affected by cost considerations

²¹ An interpretation can be made of the lines of Table 1 for zero operating grant. For most private investments, the cost is shared by the public sector and the private sector through operation of the depreciation provisions of the tax system. We have attempted to calculate that division of cost for an unsubsidised private investment in higher education. Therefore, for the calculation of the rate of subsidy, the appropriate comparison is between what the student pays under HECS or SuperHECS and what the student pays under “neutral” taxation. Thus, the subsidy under HECS for a male graduate of Table 1 in the cheapest course is \$2,800 (*i.e.*, \$14,700 - \$11,900) or 20 percent of \$14,700; for SuperHECS, the rate of subsidy is less than 9 percent. Turning to the most costly course illustrated, the subsidy under HECS is \$19,100 (*i.e.*, \$30,600 - \$11,500) or 62 percent; and 27 percent under SuperHECS.

seems to be a vital first step to transforming the university sector from a public to a private market.

Comparison of the net present values under the “Neutral” taxation regime and the current HECS system reveals major discrepancies at all levels of uniform public subsidy. In other words, a uniform HECS payment will be associated with distortions compared to the “Neutral” taxation system. It is apparent from the simulations presented below that the differential HECS system currently in place will tend to accentuate rather than ameliorate these distortions. From the perspective of achieving the efficient use of society’s resources, the current HECS system is not closely aligned with a neutral taxation system. Changes to the current arrangements are thus required.

The third model is our preferred model, SuperHECS. Under this model, students are required to pay an amount to the government equal to the fee charged plus a service fee of 33.3 percent of the fee charged. Hence, if the total liability of the student is \$26,000, this should be viewed as comprising a course fee of \$19,500 and a service charge of \$6,500 in lieu of interest, costs of administration and so on. The service charge is 25 percent of \$26,000, or 33.3 percent of \$19,500. Alternatively, if the university sets a fee of \$19,500, the student would incur a total debt of \$26,000. Only the course fee component of the total charge is permitted as a depreciation allowance. Repayments are made via the current HECS schedule, with the real rate of interest being zero.

Consider the values in Table 1 for this model for a course costing \$19,500. In the situation where the student is required to fund the full cost of the degree, the present value of the SuperHECS repayments (inclusive of the service fee and depreciation offset) would be \$14,100 for males and \$13,400 for females. Where a public subsidy equal to one-half of the cost of the degree is provided, the present value of the payments that a student would make under this arrangement is \$8,200 for males and \$8,100 for females.

The values for the other two course costs, \$24,000 and \$40,500, can be read in a similar manner.

The main points of note from Table 1 can be summarised as follows.

1. It is apparent from comparison of the present values of the repayments for the current HECS regime (of \$11,900 for males and \$11,500 for females) with those for the “Neutral” taxation regime that the share of operating costs that the government is actually paying at the present time is slightly less than 25 percent for the lowest-cost course, slightly more than 25 percent for the medium-cost course, and more than 50 percent for the highest cost course in the Table.
2. The current HECS system is not closely aligned with the neutral taxation system. As a result, there will be distortions to students’ choice of subject and the labour market.
3. For students in the two lower-cost courses, SuperHECS is a reasonable approximation to the “Neutral” taxation benchmark at all rates of public subsidy. For subsidy rates of

50 percent or more for the highest cost course, SuperHECS is also an adequate approximation of the “Neutral” taxation benchmark.

4. If a SuperHECS scheme with a uniform subsidy of operating costs of 50 percent was adopted as recommended above, there would be minimal distortions as compared to the “Neutral” taxation regime. Students in the lower-cost courses would be slightly better off, and students in the higher cost courses would be slightly worse off than under the current HECS arrangements.
5. The fact that students in the lower-cost courses are better off under this arrangement reflects the removal of the unfavourable relative treatment under current arrangements.
6. Many institutions might wish to maintain the fees for these (lower-cost) courses at their current levels. The premiums gained could be used to enhance the quality of the courses, or to subsidise other courses or research. Some institutions, however, might attach merit to offering courses at a price lower than the current HECS payments of (in net present value terms) \$11,900 for males and \$11,500 for females. This would be a competitive response to the changed circumstances, and would be a strategy that would lead to diversity and choice in the higher education sector in Australia.
7. Institutions that wish to offer high-cost courses have several options under the reforms outlined in this report. First, they could charge a SuperHECS fee sufficient to cover the current costs. Second, they might use surplus funds from other courses or endowment income to cross-subsidise the high-cost course. Third, they may offer a course that costs less to teach - recall that the costs of teaching any given course are endogenous rather than being technologically determined. Fourth, they might advance a case to the government or industry that scholarships covering the full-cost of the degree are required. In this setting, universities will be forced to be innovative.

All the simulations in Table 1 are for a benchmark case with the average income of graduates, a \$4,700 per annum HECS fee in the current differential HECS system, and a 20-year write-off period for any education expenses permitted as deferred deductions. The following sections examine the sensitivity of our findings to some of these assumptions.

Table 2 lists the net present values of payments by students for the three types of courses on the assumption that the operating grant subsidy is 50 percent of cost. The only parameter being altered in this table is the HECS fee charged: the three levels of fees under the differential HECS regime are each examined. The first of these is \$3,300 (which is the fee charged for Humanities, Social Studies, Visual/Performing Arts, Education and Nursing), the second is the \$4,700 fee that was the basis of the Table 1 calculations, and the third is \$5,500 (which is the fee paid by Law, Justice, Legal Studies, Medicine, Medical Science, Dentistry, Dental Services and Veterinary Science).

Table 2 has three sections, each dealing with a course of different cost. The operating grant subsidy in each section is set at 50 percent of cost, and the net present value of payments for

the “Neutral” taxation scheme and SuperHECS are extracted from Table 1. Hence the interest in this Table centres on the net present value of the HECS repayments for the three alternative levels of HECS, and the comparison of these with the repayments under SuperHECS and “Neutral” taxation.

Consider the three-year course costing \$19,500 to mount. If a HECS charge of \$9,900 is levied, the net present value of the average student’s payments is \$8,700 for males and \$8,500 for females. At a three-year charge of \$14,100, the net present value of the average student’s payments is \$11,900 for males and \$11,500 for females, while the present values of the typical student’s payments when a HECS fee of \$16,500 is levied is \$13,700 for males and \$13,100 for females. As there are no links between the HECS fee and the cost of the course in Table 2 (which is basically the case in practice) these net present values carry across to other sections of the table.

In comparison, the “Neutral” taxation and SuperHECS payments amount to between \$7,000 and \$8,000 in the first section of the table, implying that the only HECS fee structure for the low-cost course consistent with the principles of economic efficiency is, given the assumed level of public subsidy, one of a little less than \$9,900. Many courses in the lowest cost cell in the Relative Funding Model that the \$19,500 course cost represents, however, are priced at considerably more than \$9,900 in current values.

In the case of the medium cost course and the 50 percent subsidy used in Table 2, comparison of the net present value of payments under the current HECS regime and the “Neutral” taxation system shows that the appropriate HECS charge will be between \$9,900 and \$14,100. Finally, for the high-cost course, a HECS charge of \$16,500 is the one that yields the closest outcome to that obtained under a neutral taxation system.

These comparisons show, therefore, that in order to obtain an economically efficient outcome, it is inappropriate to levy relatively high HECS charges in relatively low cost courses, or, conversely, to levy low HECS charges in high-cost courses. The departures from the “Neutral” taxation scheme that such a pricing practice involves will be associated with distortions to students’ choices and the labour market, and thus result in an inefficient use of society’s resources. Requiring students to contribute towards the cost of their education along the lines of the SuperHECS proposal outlined above will overcome the adverse consequences of the current fee regime, while introducing much needed diversity and innovation into Australia’s higher education sector.

The second factor considered in this sensitivity analysis is the impact on the repayments of a below-average income. Two preliminary comments are in order here. First, it needs to be stressed that all the repayment schemes considered are income contingent. If the student never earns more than the minimum threshold for repayment (\$20,700 in 1997) then no repayment of the debt incurred will be required. If the student dies without ever having made a repayment on the debt then the debt obligation is extinguished. Moreover, an individual is not responsible for their spouse’s repayments. As the repayment rates are graduated, from three percent of taxable income (for income between \$20,701 and \$21,830) to six percent of taxable income (income of \$37,263 and above), the repayments should never constitute an

undue burden on an individual. Where the repayment would cause serious financial hardship or there are other special circumstances, repayment can be deferred under the current HECS system (application to the Deputy Commissioner of Taxation is required) and we envisage this arrangement continuing under SuperHECS.

Second, examination of the sensitivity of our calculations to variations in incomes serves two purposes. It provides information on the present values of the repayments of students with incomes below the average for all graduates. This is a useful exercise, as the income-contingent nature of the repayment schedule means that the schemes are asymmetric around the mean: students with incomes consistently above average will discharge their tax debits more rapidly than the average student, and for the levels of debt considered here will always pay their debts in full; students with incomes consistently below average, however, will discharge their tax debits more slowly than the average student and, in cases where incomes are sufficiently low, may not fully discharge their debts. The second purpose served by the current set of simulations is that it allows the impact of an assumption made in the construction of the age-income profiles to be indirectly assessed. In the 1991 Census of Population and Housing, information on income is collected in broad categories, the upper one of which is the open-ended interval of \$70,000 or more per year. We have followed the usual practice of assigning this open-ended income interval a mean value of one and one-half of the upper threshold (*i.e.*, \$105,000) when we compute the means for the age-earnings profiles.

The calculations in Table 3 are for an operating grant subsidy of 50 percent of standard course costs. For the three course costs of \$19,500, \$24,000 and \$40,500, the net present values of debt repayments under three income scenarios are presented, namely the standard income given by the mean income for graduates, an income stream which is always ten percent lower than the standard, and an income stream that is always 20 percent lower than the standard. All HECS debts are accumulated at \$4,700 per year (\$14,100 for a three-year degree).

Examination of the set of data for the HECS repayments reveals that each ten percentage points that a student's income is below the mean income of graduates reduces the net present value of the HECS repayments by between two and eight hundred dollars. This diminution of the present value of the HECS repayments arises because the lower incomes are associated with lower repayments in each year, and hence with repayments over a longer time period. Repayments which take place in a later year have a lower present value attached to them than repayments made at the start of a person's career.

The column for HECS clearly shows the income-contingent nature of the repayment system, and these figures, like those for the "Neutral" taxation and SuperHECS systems, should allay fears concerning the possible inequitable nature of the fee payment mechanisms considered in this report.

The present values of the repayments under the "Neutral" taxation system are affected by three influences. First, the lower incomes imply slower rates of repayment, longer repayment periods and hence a lower net present value of the repayments in exactly the same way as with the HECS system. Second, the slower rate of repayment implies higher interest charges on the outstanding debt. Third, the lower incomes result in a lower marginal tax rate in many

instances and so result in a lower value of the deferred deduction allowed for educational expenses. The fact that the present values when incomes are below average exceed the present values for the average (standard) income indicate that the lower value of the depreciation allowance and the greater amount of interest paid outweigh the effect associated with the lower present value of any payments that are automatically deferred due to the lower incomes.

The data on the present values of the loan repayments under SuperHECS reveal that, in contrast to the situation for the “Neutral” taxation system, the present values of the loan repayments decline with income. As the crucial difference between these fee-payment regimes is the replacement of a direct interest charge (the “Neutral” taxation regime) with an indirect interest charge in the form of a service fee (SuperHECS), the inverse relationship between the present value of repayments and income under the “Neutral” taxation system must be due to the interest-rate factor alluded to above. The service fee used in SuperHECS in lieu of the interest rate is the reason for the positive links between the net present values of repayments and incomes, and it can therefore perhaps be regarded as a positive feature of the SuperHECS scheme.

In summary, examination of the performance of SuperHECS when incomes are below average demonstrates the attractiveness of the income-contingent repayment arrangements implemented for university charges in Australia. To the extent that is desirable in a fee regime for the payment burden in net present values to decrease when incomes are below average, the case for SuperHECS is strengthened.

Table 4 examines the impact of choice of amortisation period on the present values of loan repayments by students. In the simulations presented the amortisation period is reduced from 20 to 10 years. *A priori*, this change should have two effects. First, the deferred deductions occur earlier in the student’s life, and so will have a greater present value, *ceteris paribus*. Second, the student will be eligible for larger deductions in some early years of the working life when incomes are relatively low. Thus, as the relatively low incomes are associated with lower marginal rates of taxation, the value of the deferred deduction for educational expenditures will be reduced. These two effects are offsetting, and their net impact is an empirical matter. As the value of the deferred deduction is sensitive to the level of taxable income, the computations presented in Table 4 are undertaken for the range of income levels used in Table 3. Hence, the Table 4 data need to be read in conjunction with the figures listed in Table 3.

The pertinent findings from this exercise are as follows. First, as tax deductibility is not a feature of the current system of HECS, the present values of the HECS payments are the same in Tables 3 and 4. Second, with respect to the “Neutral” taxation system, the use of a 10-year write off period in place of the 20-year write-off period is associated with a reduction in the present value of the repayments. The reduction is greater for the higher-cost courses (because of the larger absolute value of expenses written off when marginal tax rates are relatively low) and is greater for the standard income case than for situations where the students experience below-average incomes (because the lower marginal tax rates in effect when incomes are

relatively low reduce the value of the deferred deductions). Third, the pattern of effects for SuperHECS mirror those for the neutral taxation system.

Thus, choosing a shorter write-off period of 10 years (rather than 20 years) for educational expenses would be of benefit to the student. The changes associated with this are virtually identical for the “Neutral” taxation system and for SuperHECS. The benefits to students under SuperHECS would be in the order of \$500 to \$1000. Conversely, the Treasury would incur a loss of this amount. Whether any savings in costs of administration associated with a shorter write-off period are sufficiently great to warrant this change would be the main principle that should govern discussion. A second issue that emerges from this simulation is that the value of the deferred deduction to the student is, through the marginal tax rate, dependent on the magnitude of the income stream. Consequently, individuals with relatively low incomes derive a lower benefit from the depreciation allowance. If this is viewed as a problem with the package of reforms, a tax rebate system could be considered in place of the deferred deductions.

Consideration of the different amortisation periods introduced the Treasury as a major stakeholder in the higher education sector. The implications of our package of reforms for the Treasury will now be discussed.

7. Public Finance

In this section we report on the effects, on the flow of payments to Treasury, of a switch from HECS to SuperHECS in a simplified model. On the way, we discuss the choice of the rate of subsidy of standardised operating grants; and we outline how the model could be modified to obtain more accurate estimates of flows of public finance.

The starting point for study of the implications for the Treasury of replacement of the current differential HECS charges by the SuperHECS proposal is information on the distribution of student load across course cost levels and HECS levels. Table 5 lists data on full-time equivalent undergraduate students cross-classified by course cost and by annual HECS (deferred) liabilities. In line with the different cost cells for undergraduate courses in the original Relative Funding Model, five course costs are distinguished. The course costs assigned to these cells are \$6,500, \$8,000, \$10,000, \$13,500 and \$16,000 per annum respectively. While it needs to be acknowledged that DEETYA does not use the Relative Funding Model to distribute monies to universities (the RFM was used as a one-off exercise to realign the funding positions of the various universities), this serves as the best basis for the public finance analysis of alternative funding proposals. Table 6 lists the same information in percentage distribution form.

Tables 5 and 6 illustrate the fundamental resource allocation problem that underlies the current method of funding of higher education in Australia that has been noted previously: the contributions by students are not linked to course costs and hence the appropriate cost considerations are not reflected in student decision making. The column of data for HECS

payments of \$4,700 per annum makes this quite clear. These data show that among students incurring a deferred HECS liability of \$4,700 per year of full-time study, there are students enrolled in courses funded at an annual rate of around \$6,500, students in courses funded at \$8,000 per annum, at \$10,000 per annum, at \$13,500 per annum and at \$16,000 per annum. The fee of \$4,700 thus provides no signal whatsoever about the cost of providing the different types of degrees at a university. SuperHECS, with its specification of student contributions as a fixed proportion of course costs, overcomes this deficiency.

There are two aspects of SuperHECS in which the Treasury should be interested. First, what level of uniform subsidy is required to generate government outlays of the same magnitude as those that characterise current tertiary finance arrangements? Second, will the time profile of income receipts under SuperHECS differ from that under HECS?

Answering the first question requires a number of assumptions. The most important of these is that all HECS obligations of students are considered to be revenue. Hence, while a \$4,700 HECS charge can be reduced to \$3,525 through payment “up front”, this possibility is ignored. Similarly, while a feature of the SuperHECS proposal is that universities will receive only 75 percent of the value of SuperHECS, the total charge levied on students (i.e., inclusive of the 25 percent service fee) is viewed as revenue. This assumption is imposed to yield comparability with the treatment of the current HECS system. Second, enrolments are assumed to be insensitive to the fee charged. While the evidence shows that enrolments were not particularly sensitive to the introduction of either the uniform HECS charges in 1989 or the differential HECS charges in 1997, a correct assessment of this matter requires information on enrolments plus unmet demand. Such information is not available. To the extent that our assumption is in error, the bias is expected to be that the public outlays will be lower than in our simulations due to the switch from high cost courses to the low cost courses that are penalised under the current differential HECS charges.

The first question to be addressed in this section can be restated in a more direct form with an example of a student population of two, one enrolled in a Science degree and one enrolled in an Economics degree. At present the government outlays approximately \$13,500 per annum to educate the full-time science student. The student incurs a HECS liability of \$4,700 per annum. Ignoring the deferred nature of the HECS liability, the cost of operating the HECS scheme and the possibility of up-front payments, the net government outlay for the Science student can be considered to be \$8,800 per annum, or 65 percent of the total resource cost of the degree. For a student undertaking an economics degree, the comparable figures are: outlay of \$6,500; HECS liability of \$4,700; net outlay of \$1,800 or 28 percent of the resource cost of the degree. The average subsidy for the Science and Economics students (per dollar of resource outlay) is around 53 percent.

The results of this type of calculation, when performed for the student load in Table 5, are shown in Table 7. The first line of Table 7 reports \$3,791m as the estimated operating costs of the load shown in Table 6; and in the column labelled HECS, the third line shows \$1,732m as the HECS liabilities incurred, leaving \$2,060m as the ‘subsidy’. Thus, the average subsidy on

this basis is found to be 54.3 percent.²² Hence, to be equivalent, the SuperHECS fee would need to be imposed at the uniform rate which, when allowance is made for the tax deductibility of the educational expenses, the net outlay for the government is also \$2,060m. This rate is approximately 48 percent.

However, the calculation just reported is not the most relevant one. In our earlier discussion, we have suggested that the public sector should subsidise the ‘standardised’ operating costs of undergraduate teaching at the rate of fifty percent when moving from the current HECS system to SuperHECS. That is, universities would charge fees on top of the implicit voucher provided at the rate of fifty percent of ‘standardised’ operating costs. The reason for choosing 50 percent, and not 48 percent, relate to considerations of present values.

The present value (or “discounted present value”) of a flow of receipts is the value of ownership of, or entitlement to, the flow of future receipts. Belatedly, the public sector is moving to report the public accounts under accrual accounting standards, and not solely under the standards of cash accounting. Under accrual accounting, a cash inflow is no longer necessarily regarded, in the year it is received, as the receipt of an income which is available for current, non-capital expenditures. The flow of future HECS or SuperHECS payments is an asset, one which, incidentally, could be securitised or otherwise sold. Thus, the payment by graduates of some of their HECS or SuperHECS debts should not be regarded as current income, available for non-capital spending in the year of receipt; instead, what should be regarded as available for non-capital spending is a normal yield from the asset concerned. In this context, comparisons of present values are appropriate, from a public economics viewpoint.²³

To a close approximation, a SuperHECS fee equal to fifty percent of cost would yield the same net SuperHECS payments as HECS payments, in present value terms, from graduates who had the following characteristics: completed three year degrees, full-time, in numbers exactly equal to 1996 full-time-equivalent enrolments by Relative Funding Model and HECS categories (Table 6) in courses with actual costs in our synthetic Relative Funding Model as reported above; all students deferred the payment of HECS and SuperHECS fees; upon graduation, each earned the mean incomes by age, of employed graduates in the 1991 census (up-dated to 1997, as explained earlier). Under the assumptions listed, the present value of HECS liabilities is \$1,480m and the present value of SuperHECS payments after tax credits is \$1,474m (see last line of Table 7).

²² An average ratio of HECS obligations to cost of 45.7% is greater than the 41.3% average ratio, reported on the basis of the rate of Commonwealth funding for each discipline group in 1997 (Caroline Allport, letter to the *Aust. Fin. Rev.*, May 30, 1997, p. 36).

²³ If the appropriate discount rate is applied, the owner of an asset should be indifferent between the ownership of a flow of receipts through a number of years, and the ownership of a lump-sum equal to the present value of the flow. The appropriate rate of discount is that which enables the owner to transform one stream of cash flows into another stream (so as to ‘finance’ each year’s consumption expenditures or outlays). Of course, future taxation receipts can be sold for a lump-sum by governments, so the same arguments, relating to ‘consumption smoothing’, in theory apply to tax receipts as to HECS receipts.

Incidentally, on our calculations the HECS tuition fees incurred for 1996 are around \$1,300m (or three-quarters of the \$1,732m estimated HECS liabilities), and the present value of debt payments is \$1,480m on the simplifying assumptions listed above. This suggests an apparent profit of \$180m from the loan scheme for that year. Adverse selection²⁴ and the over-estimation of the present value of debt payments, as discussed below, would reduce the profitability.

We turn now to the assumptions used. The present value calculations are derived from estimates of the annual flows of payments. One crucial set of assumptions related to the growth of incomes received, and those things that depend on income, namely, rates of taxation and repayment schedules; and those that probably relate to income in the economy, namely, course costs and fees. As to incomes, for the present value estimates of Table 7 we assumed that there was 2 percent real growth per year from 1991 to 1997 but none subsequently. To the extent that the crucial parameters in the SuperHECS model (*e.g.*, repayment thresholds, tax rates) are also indexed to real income growth, this assumption will be innocuous.²⁵

Clearly, not all graduates earn the average income of employed graduates. In Table 3, we reported the results of variations in income. That Table is an extract from a larger set of calculations of variations in payments in response to proportional variations in income (from 20 percent to 180 percent of 'census' income). What these calculations show is that the relationship between payment and income for HECS is very like that for SuperHECS. (There is, however, a sharp contrast with the results of the "neutral" tax treatment of fees.) Therefore, we are reassured that a more sophisticated modelling of graduate incomes would not greatly alter the choice of 50 percent for the subsidy rate on operating costs.²⁶

²⁴ The present value of payments exceeds debt for students with levels of debt \$15,000 or below and who expect incomes 80 percent of census or above, on our assumptions. For higher debts levels, the ratio payment to debt is still above one at moderately high incomes; for example, the ratio is 1.12 for a debt of \$20,000 and an income stream equal to 120 percent of 'census' income. If these students have the ready cash or access to a cheaper alternative source of loans funds, they have an incentive to consider not borrowing under the HECS scheme unless planning to leave the country. However, the income-dependent nature of the debt payments suggests a willingness on the part of risk averse students to pay a premium.

²⁵ We have also made some preliminary simulations of the time series of annual inflows of HECS and SuperHECS payments under these assumptions (that is, following successive cohorts of students through time, and aggregating their payments in each calendar year). This yields fluctuating series of payments through time for HECS and SuperHECS. These fluctuations, as has been argued above, can lead to a financing burden on government, of a kind that should not seriously influence the choice between systems of university finance.

²⁶ We have calculated the present values of payments under HECS and under SuperHECS, for various levels of income, where 'income' is defined as percentage of census age-earnings profile, up-dated to 1997 by assuming 2 percent growth per year since the 1991 census. From these calculations, we have estimated functional relationships between present values and income. For example, for a HECS debt of \$9,900 the estimated relationship is: present value = \$9992 - 1454/income. If income is equal to 'census' income, then this estimated relationship gives a present value of \$8538 (compared with the calculated figure of \$8718). Similar relationships exist for the other levels of debt; the 'fits' are good except at very low incomes, and are concave from below. By concavity, the mean present value of payments, calculated from a set of

Although we have not included early (or up-front) payment of fees in our calculations, we would not expect inclusion of this feature to alter the required subsidy rate from 50 percent. Our comparison is, after all, based on present values; and our model assumes that the Treasury pays the HECS or SuperHECS tuition fee to the university, up-front. Therefore, unless the patterns of early student payment differ greatly between the current HECS system and our proposed SuperHECS system, the required ratio of operating grant to standardised cost should not alter much from fifty percent.

There are two major deficiencies in our calculations, in that they assume no responsiveness, in demand nor in supply, from a change in the funding system. The calculations assume that universities charge fees exactly equal to the operating grant, no more, no less: yet one of the major purposes of the proposal is to permit universities to decide upon their own fees for undergraduates. Similarly, we have not allowed in our calculations for any response in student enrolments to changes in fees and course costs. Since variations in demand and supply will be in response to a more rational and economically-justified funding system, they will be desirable. Nonetheless, they could impose additional costs on the Treasury, which we have not estimated.

8. Recapitulation

In this paper we have proposed an alternative funding scheme for Australian higher education. It is an integrated package that modifies existing funding arrangements by permitting universities to set their own course fees. It also adds a new element, deferred tax deductibility of those fees. Our proposed funding scheme recognises the strength of the case for public assistance to higher education, as acknowledged by the Productivity Commission and most commentators, but not any case for large variations in the rates of subsidy offered to students in different degree courses. The public subsidy is to be provided as a flat proportion, say 50 percent, of standardised course costs and is to be paid directly to the university on actual enrolments, by way of operating grants. Each university set fees for each course, zero if it wants, but otherwise over and above the public grant. Available to all students who bring with them a public subsidy is a loan system called SuperHECS, modelled on the successful HECS arrangements. For these, the vast majority of Australian under-graduate students, there will be no up-front, course fees: payment is deferred, as in HECS. In recognition of the fact that these educational expenditures are investments, we insist on tax deductibility of fees paid, on an amortisation schedule. As with SuperHECS repayments, the tax deductions can be deferred until income reaches some appropriate level.

incomes distributed about the mean income, will be less than the present value of payments made by the person with the mean income. We have not estimated this difference. However, what matters for the present purpose is the variation of this difference, between HECS and SuperHECS; our work suggests that it is small.

Table 1: Net present values of payments by students under alternative fee regimes, three-year degree

Course Cost	HECS fee charged	HECS Repayments		Operating Grant as % of cost	Course Fee	SuperHECS		“Neutral” Taxation	
		Males	Females			Males	Females	Males	Females
\$19,500	\$14,100	\$11,900	\$11,500	0	\$19,500	\$14,100	\$13,400	\$14,700	\$15,300
	\$14,100	\$11,900	\$11,500	25	\$14,600	\$11,400	\$11,000	\$11,100	\$11,500
	\$14,100	\$11,900	\$11,500	50	\$9,800	\$8,200	\$8,100	\$7,400	\$7,700
	\$14,100	\$11,900	\$11,500	75	\$4,900	\$4,500	\$4,500	\$3,700	\$3,800
\$24,000	\$14,100	\$11,900	\$11,500	0	\$24,000	\$16,400	\$15,200	\$18,100	\$18,900
	\$14,100	\$11,900	\$11,500	25	\$18,000	\$13,300	\$12,700	\$13,600	\$14,100
	\$14,100	\$11,900	\$11,500	50	\$12,000	\$9,700	\$9,500	\$9,100	\$9,400
	\$14,100	\$11,900	\$11,500	75	\$6,000	\$5,400	\$5,400	\$4,500	\$4,700
\$40,500	\$14,100	\$11,900	\$11,500	0	\$40,500	\$22,300	\$19,300	\$30,600	\$31,800
	\$14,100	\$11,900	\$11,500	25	\$30,400	\$19,000	\$17,200	\$23,000	\$23,900
	\$14,100	\$11,900	\$11,500	50	\$20,300	\$14,500	\$13,700	\$15,300	\$15,900
	\$14,100	\$11,900	\$11,500	75	\$10,100	\$8,500	\$8,300	\$7,700	\$8,000

Table 2: Net present values of payments by students under alternative fee regimes, three-year degree

Course Cost	HECS fee charged	HECS Repayments		Operating Grant as % of cost	Course Fee	SuperHECS		“Neutral” Taxation	
		Males	Females			Males	Females	Males	Females
\$19,500	\$9,900	\$8,700	\$8,500	50	\$9,800	\$8,200	\$8,100	\$7,400	\$7,700
	\$14,100	\$11,900	\$11,500	50	\$9,800	\$8,200	\$8,100	\$7,400	\$7,700
	\$16,500	\$13,700	\$13,100	50	\$9,800	\$8,200	\$8,100	\$7,400	\$7,700
\$24,000	\$9,900	\$8,700	\$8,500	50	\$12,000	\$9,700	\$9,500	\$9,100	\$9,400
	\$14,100	\$11,900	\$11,500	50	\$12,000	\$9,700	\$9,500	\$9,100	\$9,400
	\$16,500	\$13,700	\$13,100	50	\$12,000	\$9,700	\$9,500	\$9,100	\$9,400
\$40,500	\$9,900	\$8,700	\$8,500	50	\$20,300	\$14,500	\$13,700	\$15,300	\$15,900
	\$14,100	\$11,900	\$11,500	50	\$20,300	\$14,500	\$13,700	\$15,300	\$15,900
	\$16,500	\$13,700	\$13,100	50	\$20,300	\$14,500	\$13,700	\$15,300	\$15,900

Table 3: Net present values of payments by students with alternative income levels, three-year degree

Course Cost	Operating Grant as % of cost	HECS			SuperHECS			“Neutral” Taxation		
		Standard	<u>Income</u> Less 10%	Less 20%	Standard	<u>Income</u> Less 10%	Less 20%	Standard	<u>Income</u> Less 10%	Less 20%

1. Males

\$19,500	50	\$11,900			\$8,200			\$7,400		
			\$11,700			\$8,100			\$7,400	
				\$11,100			\$7,700			\$7,600
\$24,000	50	\$11,900			\$9,700			\$9,100		
			\$11,700			\$9,500			\$9,200	
				\$11,100			\$9,100			\$9,400
\$40,500	50	\$11,900			\$14,500			\$15,300		
			\$11,700			\$14,100			\$15,500	
				\$11,100			\$13,400			\$15,800

2. Females

\$19,500	50	\$11,500			\$8,100			\$7,700		
			\$11,100			\$7,900			\$7,800	
				\$10,300			\$7,400			\$8,000
\$24,000	50	\$11,500			\$9,500			\$9,400		
			\$11,100			\$9,200			\$9,600	
				\$10,300			\$8,600			\$9,900
\$40,500	50	\$11,500			\$13,700			\$15,900		
			\$11,100			\$13,100			\$16,200	
				\$10,300			\$11,800			\$16,600

Table 4: Net present values of payments by students with 10-year write-off depreciation period, three-year degree

Course Cost	Operating Grant as % of cost	HECS			SuperHECS			“Neutral” Taxation		
		Standard	<u>Income</u> Less 10%	Less 20%	Standard	<u>Income</u> Less 10%	Less 20%	Standard	<u>Income</u> Less 10%	Less 20%
1. Males										
\$19,500	50	\$11,900			\$7,700			\$6,900		
			\$11,700			\$7,600			\$7,000	
				\$11,100			\$7,400			\$7,300
\$24,000	50	\$11,900			\$9,100			\$8,400		
			\$11,700			\$8,900			\$8,600	
				\$11,100			\$8,700			\$9,000
\$40,500	50	\$11,900			\$13,400			\$14,300		
			\$11,700			\$13,000			\$14,500	
				\$11,100			\$12,700			\$15,200
2. Females										
\$19,500	50	\$11,500			\$7,700			\$7,300		
			\$11,100			\$7,500			\$7,400	
				\$10,300			\$6,900			\$7,600
\$24,000	50	\$11,500			\$9,000			\$8,900		
			\$11,100			\$8,700			\$9,100	
				\$10,300			\$8,000			\$9,300
\$40,500	50	\$11,500			\$12,800			\$15,100		
			\$11,100			\$12,200			\$15,400	
				\$10,300			\$10,800			\$15,700

**Table 5: 1996 Full-time Equivalent Student Load Cross-classified
by Annual Course Cost and Level of HECS (number)**

RFM Weight	Course Cost	<u>HECS Level</u>		
		\$3,300	\$4,700	\$5,500
1.0	\$6,500	37,525.1	72,628.9	23,016.0
1.3	\$8,000	76,972.4	20,565.8	
1.6	\$10,000	46,196.3	45,830.8	
2.2	\$13,500		72,986.9	
2.7	\$16,000		5,195.9	9,791.4

Source: Compiled by authors from data supplied by the Department of Employment, Education, Training and Youth Affairs

**Table 6: Percentage Distribution of 1996 Full-time Equivalent Student Load
by Annual Course Cost and Level of HECS**

RFM Weight	Course Cost	<u>HECS Level</u>		
		\$3,300	\$4,700	\$5,500
1.0	\$6,500	9.14	17.68	5.60
1.3	\$8,000	18.74	5.01	
1.6	\$10,000	11.25	11.16	
2.2	\$13,500		17.77	
2.7	\$16,000		1.27	2.38

Source: Table 5.

**Table 7: Costs, Debts and Repayments: Comparison of HECS and SuperHECS,
1996 Student Load**

	HECS \$m	SuperHECS \$m
Costs of EFTSUs	3791	3791
Tuition Fees	1299	1896
Debt Incurred*	1732	2528
Apparent Subsidy	2060	1264
<i>Apparent Subsidy Rate(%)</i>	<i>54.3%</i>	<i>33.3%</i>
PV Repayments of Debt	1480	2031
PV Tax Credits		557
PV Net Payments**	1480	1472

Notes: * assumes all students borrow with a 33 percent service fee
 ** totals do not add, due to rounding

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