

## **Reform of Ethiopian Higher Education Financing: Conceptual and Policy Issues**

Bruce Chapman\*

June 1999

Economics of Education Thematic Group

The World Bank

**ABSTRACT:** This paper examines two issues related to higher education financing. The first is conceptual and involves an explanation of the economic and social case for: (i) having higher education charges; and (ii), for such charges to be collected according to a former student's income. The issues addressed are matters of principle and thus apply to all countries. Second, possible reforms of current Ethiopian higher education financing arrangements are considered in the context of the conceptual framework. This discussion represents the author's view of how Ethiopian policy in this area can be improved in a way that achieves more propitious outcomes in both economic and social terms.

\*The author is an academic economist with considerable experience in the area of higher education financing policy and research. He is acknowledged to be the architect of the world's first income contingent charging system for higher education, introduced in Australia in 1989. Many countries have successfully followed the Australian example, with the author often contributing to these developments in an advisory capacity. Recently he has been a consultant to the World Bank on higher education financing policy in Malaysia and Ethiopia, with the latter engagement motivating this paper. He is very grateful for the support given by the World Bank, particularly from Mona Haddad, Harry Patrinos and Nicholas Bennett. All errors and omissions are his responsibility.

### **Preface**

The following paper was written after the author was engaged as a consultant to the World Bank on the issue of higher education financing in Ethiopia in April/May 1999. Two issues are examined.

The first is conceptual and involves an explanation of the economic and social case for: (i) having higher education charges; and (ii), for such charges to be collected according to a former student's income. The issues addressed are matters of principle and thus apply to all countries.

Second, possible reforms of current Ethiopian higher education financing arrangements are considered in the context of the conceptual framework. This discussion represents the author's view of how Ethiopian policy in this area can be improved in a way that achieves more propitious outcomes in both economic and social terms.

The paper has potentially very useful applications for World Bank consideration of higher education financing reform in many countries. Its strength lies in the presentation of the principles of such reform, and these have relevance in all environments. There is also an examination of some of the practical matters related to policy implementation in this area. As is always the case, the institutional, historical and political contexts of particular countries matter with respect to the propitious application of policy.

---

## **1. Introduction**

Currently in Ethiopia there are no direct charges on students who attend higher education. Moreover, a high percentage of those enrolled have access to free board and lodging, at least after the first year of study. There is also an up-front fee for attendance in the last years of high school.

In combination these policies have two implications: on average, the cohort of higher education students are undoubtedly made up of people drawn disproportionately from the most socio-economically advantaged of Ethiopian society; and, the financing arrangements involve considerable subsidies to this privileged group. As currently constituted, these arrangements mean that policy is highly regressive.

There are important reasons to question the Ethiopian approach to higher education financing, and what follows addresses this. The conceptual issues are now set out in order to motivate a different policy response. This section is followed by some observations concerning the inadequacies of current Ethiopian higher education financing policy.

## **2. Principles of Higher Education Financing Policy**

### 2(i). Background

What now follows examines the three conceptual principles of higher education financing. As well, the discussion considers briefly the critical issue of implementation. The goal is to establish a framework which might underpin and make more rational the process of higher education financing policy reform.

After the principles are described a comparison with current Ethiopian approaches is offered.

### 2(ii). The Principles

Principle (1): There should be a charge for undergraduate teaching

The benefits of higher education teaching are thought to accrue to both individuals and to society as a whole. For individuals they take the form of personal, cultural and economic rewards, with there being little doubt that graduates typically enjoy substantial

advantages over non-graduates in the labour market. For example, in all countries for which reasonable data are available lifetime incomes are much higher on average; the limited Ethiopian statistics suggest that these stylised facts are as true in this country as elsewhere.

This raises essential equity and efficiency issues. The first are now considered.

There are basically two equity reasons for charging the users of higher education. The first is known in the economics literature as 'vertical equity', and can be explained as follows.

If the government does not charge for higher education, the minority who receive it are being subsidised by those who do not attend higher education. That is, all taxpayers have paid for the gift of higher education, and it is equitable that those so advantaged pay in part an additional amount for the individual benefits they receive. The point can be made by posing the rhetorical question: should non-graduates pay a similar proportion of income for the costs of higher education as do graduates?

This vertical equity point is independent from, although related to, the fact that the measured after-tax rate of return to higher education investments are high on average. The fact that the average private returns to higher education are high reflects the extent of the subsidy.

The second standard equity point is known as 'horizontal equity', and can be explained as follows. Imagine two people on identical high incomes, with one being talented at sport (or good at business), and the other being a higher education graduate. If they both pay the same tax this is horizontally inequitable because the former has subsidised the education of the latter which has in turn increased her/his income.

A second point concerning horizontal equity relates directly to the issue of graduates 'paying' for their education. That is, some opponents of graduates contributing to part of the cost of their education argue that this is unreasonable because the extra taxes that graduates pay more than cover the public subsidy involved.

This point might seem stronger in a country such as Ethiopia given the limited coverage of the tax system and the fact that in proportionate terms graduates are more likely to be taxpayers because they are more likely to be in the formal (meaning taxpaying) sector. While this might be true the essential point has a philosophical basis related to the tax system, which is now explained.

Tax revenue is used for a myriad of purposes - defence, health, compulsory education, prisons, and for redistribution, among other things. If the extra taxes paid by higher education graduates are only supposed to be allocated to repaying the public subsidy for their education, this implicitly excuses them from paying for (or paying a lower proportion for) the other public services that all other taxpayers subsidise. The point is

that graduates only 'pay' for their higher education gift through higher taxes if and only if the extra tax paid is used disproportionately for higher education.

Obviously this point is closely related to the initial horizontal equity issue, and can be put in the same terms: if the government implicitly excuses the graduate from the payment of other tax obligations from their additional tax payment in the same proportion as others on an identical income, non-graduates who have a high salary because of their hard work or natural talent are being treated unfairly; they will be paying a disproportionate amount of the tax bill for non-higher education public goods.

Related to the equity issues explained above, there is a commonly expressed lifetime income distribution argument for charging for higher education. In Australia, for example, there is overwhelming evidence that those who gain access to higher education generally come from advantaged socio-economic backgrounds, and certainly as graduates end up in the upper echelons of the income distribution.

As noted, there is no doubt that graduates' lifetime incomes far exceed on average the incomes of less educated groups. The better measure of lifetime advantage, average after-tax rate of return calculations, support this. That not charging for higher education subsidies is regressive in a lifetime income distribution sense seems to be incontestable.

Some part of the argument for a higher education charge made on the basis of the distribution of lifetime income reflects a value judgement about what a good society should look like. It suggests that a role for government is to redistribute towards and not away from the lifetime poor. It implies further that it is desirable to diminish the strength of the already strong nexus between children's' lifetime economic opportunities and the socio-economic standing of their parents. In Ethiopia this seems to be as true as it is in all other countries.

Principle (2): There should be a public subsidy for higher education

Economic theory suggests that government subsidies should be set equal to the valuation of the social benefits of an activity, above and beyond the advantages for the individual. These are known as spillover benefits. In an understanding of the spillovers from higher education it is useful to distinguish the various components of expenditure into research, community benefits, and teaching.

The societal returns from research are likely to be very high. Ideas emanating from research do not generally result in significant material rewards for academics, and should be treated quite differently from spillovers from teaching. As well, academics frequently provide highly useful input into community discussion of research and policy issues, through, for example, radio and television commentary and debate, and by way of informing journalists, politicians and others of significant research findings. There is a strong case for a public subsidy for these community benefits, although their societal value is close to impossible to work out.

The spillovers from higher education teaching are alleged typically to take the following forms:

- higher tax revenue resulting from the higher productivity and wages of the more highly educated;
- more informed public debate and voting behaviour, and more tolerance; and
- the benefits accruing to workers and others from the imitation of the skills of the highly educated that do not accrue to graduates.

None of the above has been quantified to the point that there is agreement on their worth. However, there is some consensus that at the margin the value of externalities is likely to be greater at the primary and secondary levels than it is for higher education. Even so, most commentators suggest that the additional learning from higher education delivers some societal benefits, but there is little consensus concerning their size.

The other issue concerning the value of the spillovers from teaching is that, at the margin, they are likely to fall as the system expands. This would seem to imply a lower subsidy as higher education moves from elite to mass. In Ethiopia currently this is not important given the very low enrolment rates in higher education.

Over the last few years an additional issue has emerged that might help in the assessment of educational externalities. This research goes beyond, and is a useful addition to, the conventional understanding of the potential benefits of tertiary education. It is known as ‘new growth theory.’

New growth theory promotes to centre stage the potential significance of the accumulation of human capital as a determinant of economic growth. In particular, higher levels of education are seen to facilitate technological progress, which is the engine of growth.

One dimension to these relationships which has been well researched in the labour economics literature involves the nexus between formal education and on-the-job training, and the link between the latter and the adoption and adaptation of new methods of production. In this literature, higher levels of on-the-job training lead to the more efficient implementation of technological change which, as noted, is the most important factor for increasing productivity.

The essential point is that workers with high levels of firm specific skills understand how a given generic advancement in technology applies to their particular workplace, and will thus be able to implement it relatively effectively. That is, it is well documented that a significant practical aspect of technical change at the firm level is the implementation of new production processes in the context of the idiosyncratic workings of a given work environment. The evidence points to a strong positive connection between higher levels of formal education and investments in informal training at the firm level.

A more direct point with respect to the value of education in terms of the externalities related to economic growth is that there is now compelling evidence that high levels of formal education are critical to the successful introduction of new capital equipment (Bartel and Lichtenberg, 1987). That is, labour with high levels of education is in greater demand when the newest physical capital (machinery) is being introduced at workplaces, which implies that higher education enhances economic growth by facilitating the introduction of technical change embodied in new equipment.

Establishing that higher education matters for the process of technological change does not by itself mean that there are externalities. It also has to be the case that firms and their higher educated employees have difficulty in protecting property rights from the implementation of new technology. If technological change flows easily from one workplace to the next, the benefits of tertiary education are not completely captured by the individual, which means that some part of the social benefit is an externality.

One reason this might happen is through a highly imperfect patents system, meaning that improvements developed in one firm have only a poor legal basis for protection. A second is through the existence of practices such as reverse engineering (in which a firm takes apart the product of its competitors to determine how it has been made). Both imply that the rewards from technological innovations flowing from tertiary education investments are not restricted only to the more highly educated and the firms that employ them. Given that the benefits accrue broadly to society this promotes a case for government subsidies.

However, there are (at least) two complications in trying to apply the above lessons. One is that the benefits will differ between courses and disciplines (as well as between individuals). More 'vocational' study, for example, is sometimes argued to have fewer externalities than more 'educational' study.

The second difficulty, implied earlier, is that currently there are no empirical techniques or data that permit evaluation of these externalities. Indeed, it is unlikely that such quantification can be made, and presumed values of externalities will continue to be contentious and subjective.

In conclusion, it is not currently possible to accurately quantify the extent of spillover benefits from higher education, but if they exist there is a rationale for some form of government subsidy to ensure that society receives the appropriate level of higher education investment. Because there are net private benefits there is still an equity case for a charge. Externalities from higher education - with the case being strongest for those associated with technological change - mean that the costs should not be paid for entirely by students. But with that noted, there is as yet no compelling evidence on the appropriate size of the subsidy, only that it should exist.

Principle (3): Universal income contingency is the right way to collect charges

One of the biggest policy questions is that, since there is a case for charging, what is the appropriate collection arrangement? This turns out not to be at all difficult given that there is now a plethora of economic analyses promoting income contingent repayment as the best model. This is now explained.

There are (at least) two different ways of paying a charge: up-front fees; and income contingent repayment. Within the first category there are many different approaches such as with and without scholarships, and with and without a government-subsidised loan scheme. What follows explores briefly some broad variations in these categories, and analyses in some depth why income contingent repayment schemes are preferable to all alternatives.

It seems clearly to be the case that a significant part of the population faces barriers to participating in higher education, and that these barriers are at least in part economic. If this is true and fees are imposed without recognition of financing problems there will be adverse economic and social outcomes.

Charging fees with the wrong collection system will mean, for example, that academic talent will be wasted if able but poor students can't access the system. The wrong charging system also means that being born with poor or ungenerous parents becomes a negative determinant of one's access to professional opportunities and success. This is impossible to justify on equity terms, for reasons now explained.

The first economic problem associated with charging up-front fees for higher education is that for those who can't afford to pay there is only an ineffective capital market available for borrowing. The basic concern for a bank lending for human capital investments is that, unlike many other investments, there is no saleable collateral in the event of default, such as would be the case for the housing capital market. This arises in part because slavery is against the law, and banks are thus unable to possess and sell the human capital development undertaken.

The other possible concern for commercial banks lending to students relates to collection costs in the event of default, an issue which assumes greater importance given the absence of collateral. The costs of default appear to be very real.

Governments typically address the above problems by acting, in the limit, as a guarantor for student loans, and by paying the interest for the period before graduation. However, because of the expense involved loans are usually only made available to young people with poor parents or those who can establish independence through satisfying a complex set of conditions related to age and/or work experience. This suggests that some prospective students who need financial assistance because their families do not provide help will be unable to access the system.

The financial barrier, then, is not completely removed through means testing, because when this is done on the basis of family income such an approach presupposes that parents or partners are willing and able to share resources. However, if that assumption

does not hold, then the use of family income to determine support is a flawed criterion. In essence, the idea of means-tested scholarships or means-tested access to loans in order to circumvent the problem of up-front fees for 'deserving' students relies on the assumption of willingness to help within the family, and can thus fail because of it.

The central point about barriers to entry in higher education is this: it is the high cost of participating in higher education (both through direct living costs and foregone income), combined with a lack of family and capital market sources of finance, that creates a significant barrier for many students. Income contingent repayment arrangements avoid these problems because the nexus between current economic circumstances and access to the system does not exist with these approaches. This is a critical point: income contingent repayment makes family economic status less relevant for the prospective student.

There is a further issue implying strongly that income contingent repayment is the correct approach compared to the normal loan arrangements designed to fix up the failure of capital markets as a solution to the lack of collateral in higher education investments. The key to understanding income contingent schemes is acknowledging the difference between normal 'mortgage-style' loans, and the nature of the loan implicit in the deferred fee.

Mortgage-style loan arrangements (such as for usual bank loans) involve the borrower's repayments being made over a specified period of time. Usually no account is taken of changes in the borrower's circumstances over that period, either for better or for worse. Most notably, a borrower is afforded no protection against having low income in the future - repayments are still due within the given period of time.

The essential difference between the two types of loans is that the income contingent variety serves to protect low-income earners and those who generally do not benefit financially from the investment undertaken. Income contingent schemes (like the Australian Higher Education Contribution Scheme (HECS), introduced in 1989) offer a form of 'default insurance', in that the former student does not have to bear the costs of not being able to pay their debt. This is diametrically opposite to a mortgage-style loan, in which the costs of defaulting on the loan may be very high indeed - in terms of being locked out of other capital markets (most notably housing) through the damage to a borrower's credit reputation.

Default protection via income contingent repayment sorts out the fundamental problem for prospective borrowers inherent in mortgage-style loans. That is, a concern with the possibility of being unable to repay a loan, or only being able to repay it with hardship, will mean that there is less borrowing for education purposes than is desirable. This won't be the case if repayment depends on income.

Some part of an aversion to borrowing for human capital investment is perfectly understandable. After all, the investment returns to higher education have a very high variance - many students don't graduate, unemployment exists, and the differences in

income within occupational categories, even for graduates, are very high. But when there is no chance of default as is the case under income contingent repayment the issue disappears.

The bottom line is as follows. Economic theory is very clear about what is the right way to charge for higher education services: it is income contingent repayment. This approach maximises the potential for the most talented and motivated prospective students to be involved.

Unlike up-front fees, income contingent repayment is much less likely to diminish the participation of the talented poor. And unlike means-tested scholarship schemes excusing the payment of up-front fees for those from poor families, prospective students without scholarships and with ungenerous parents or partners will not have a direct financial barrier to access the system. This must mean a waste of talent, and thus a national economic cost.

Related to this is the social dimension. For those who make the value judgement that social justice is well served if policy acts to minimise the strength of the nexus between family background and likely future professional success, income contingent payments for higher education are the only way to go. They make far less relevant a prospective student's socio-economic background compared to all other possible charging mechanisms.

The above discussion is critical. Reform to higher education teaching funding will be inadequate unless there is some form of universal income contingent loan scheme.

Principle (4): To be operational income contingent charge mechanisms require particular institutional arrangements.

In order for an income-contingent loan arrangement to be implemented there are several pre-conditions. If they do not exist alternative higher education financing policies have a greater weight, at least until the contemporary institutional environment changes. The essential pre-conditions for the efficient operation of an income-contingent charge are as follows.

First, the future repayment obligations of enrolling students have to be recorded. This entails university administrators noting the obligation and liaising with the relevant collection agency. This need not be administratively expensive. In the Australia, for example, the introduction of HECS was accompanied by a \$A10 million outlay to cover university costs, a trivial sum in the context of the current revenue raised of around \$A800 million per annum.

Second, and most important, is that for a loan to be collected on the basis of a former student's income, it is essential that individuals' future incomes are known with accuracy. The obvious institutional arrangement is through a comprehensive and dependable income tax system, and this is the mechanism used in the Australian and New Zealand

income contingent loan operations. But for some countries, Ethiopia being among them, another approach is required.

In the absence of universal income tax coverage there are several possibilities. For example, social security identifiers could be employed. Such a system operates in Ghana in this country's income contingent charge system for higher education.

The bottom line is that a major challenge with respect to the implementation of income contingent loan systems in third world countries is the collection mechanism. The critical point is that it is not possible to collect repayments without identification over time of former student's income circumstances. This promotes the significance of having income tax or social security mechanisms which allow such identification; in the absence of such institutions different approaches are necessary.

## 2 (iii). Conclusion

In approaching the question of what countries' higher education financing systems should look like there are basic conceptual principles. One, there should be a charge for the service. Two, the charge should be less than the public subsidy. And, three, the charge should be collected depending on the income of the former student. There is the additional practical question related to implementation raised in Principle (4). What these issues imply for reform of the current Ethiopian arrangements is now considered briefly.

## **3. The Ethiopian System in Conceptual Context**

### 3 (i). Background

The principles espoused above can be used as benchmarks to assess the appropriateness or otherwise of current Ethiopian higher education financing policy, described briefly in the Introduction. It is apparent that the current Ethiopian approach is in many ways not consistent with these principles, and this is now explained. The essential points are as follows.

### 3 (ii). Why Ethiopian Higher Education Financing Policy Does Not Match the Principles

Issue (1): The public subsidy for tuition is too high.

The fact that there is no tuition charge for higher education students in Ethiopia implies strongly that the system is regressive. While the evidence is poor, it is extremely likely that the considerable public subsidies for higher education go to the children of socio-economically advantaged families. Further, Ethiopian graduates seem to do well in income terms relative to the country's population in general.

Not charging for higher education - that is, a 100 per cent public subsidy - is unusual in an international context. For example, on average the public sector higher education subsidy is around 30-60 per cent in the US, Australia, New Zealand and Canada, and

even lower in Japan. Recently subsidies have been reduced in Ghana and Namibia, and student charges are very likely to eventuate soon in the UK, South Africa, and other countries.

Issue (2): Free Board and Lodging for Higher Education Students Reinforces the Current Regressivity

In Ethiopia a large number of higher education students are provided with board and lodging at no charge. This subsidy reinforces the conclusion that the current no-charge system is regressive. To put the point rhetorically: is it fair that some of the most socio-economically advantaged members of Ethiopian society are provided with the means of survival while many others in receipt of little assistance face extreme poverty and deprivation?

Issue (3): The Access of the Less Privileged to Higher Education is Compromised by Up-Front Charges for Upper Secondary Schooling

Charging students attending upper secondary schooling must inevitably influence the composition of students enrolled in higher education. In combination with the policies of not having a higher education charge, and providing a large number of higher education students with free board and lodging, up-front fees in secondary schooling ensure that Ethiopian university graduates are both highly privileged and heavily subsidised.

It is important to recognise that up-front charges for Ethiopian secondary schooling are undesirable for reasons other than equity. There are obvious economic inefficiencies when policy means that some talented, but poor, prospective students are unable to fulfil their professional potential and contribute to Ethiopian economic development. The policy implies strongly a waste of economic resources as well as a social inequity.

#### **4 The Bottom Line for Reform of Ethiopian Higher Education Financing**

Reforms to the financing of Ethiopian higher education should incorporate the issues and arguments outlined above. A charge is justified, and the best mechanism is collection depending on a graduate's income. The following issues arise.

The first is that an income-contingent charge mechanism does not deliver significant revenue immediately, as an up-front fee system could. In the current context this issue might be particularly relevant for Ethiopia in that the families of contemporary higher education students have already demonstrated a capacity and willingness to pay fees for upper secondary schooling, implying that the same would be the case for university attendance. That is, it might be likely that a small up-front fee could be imposed without deleterious consequences for the participation of the disadvantaged.

But if this is the new policy regime it has to be recognised that eventually the potency of the arguments against up-front fees explained above will come into play. Moreover, if up-front fees in upper secondary schooling are abolished it follows that the socio-

economic make-up of those eligible for university will - over time - constitute a much more representative group. When and if this happens an up-front fees policy for higher education, compared to an income contingent charge arrangement, will certainly constitute a barrier to entry for talented but poor prospective students.

The other point is that income contingent charges can raise revenue immediately, as is the case in Australia. This happens if the policy offers a discount for those paying up-front, a sensible option given that governments place a relatively high value on revenue delivered in the short run. In the Australian context students paying at the point of entry received a 25 per cent discount of the on-paper charge, and about 20 per cent of students take the option. In other words, an income contingent charge system can be designed to deliver revenue immediately.

Finally, a critical issue raised in the discussion of principles relates to the capacity in Ethiopia for the collection of the charge. As explained in Principle 4 above, an income contingent system can only work if the government is able to document both the obligations and the income of former students. In countries such as Australia, New Zealand, the UK and Canada, this has turned out to be fairly straightforward, but in Ethiopia the challenge is clearly more significant.

It helps that most graduates in Ethiopia take employment in the public sector, for example, as bureaucrats, nurses and teachers. In such employment there is a relatively close documentation of salaries and a concomitant workable direct taxation mechanism. There is also the potential to use superannuation arrangements as an income contingent charge collection mechanism. Given the continuing and growing importance of the issue it is critical that implementation possibilities are accorded a high priority in higher education financing policy reform.

## References

Barr, Nicholas (1989), *Student Loans: The Next Steps*, Aberdeen Press.

Bartel, Ann P. and Frank R. Lichtenberg (1987), "The Comparative Advantage of Educated Workers in Implementing New Technology", *Review of Economics and Statistics*, Vol. 69 (1): 1-11.

Barr, N. (1976), *Student Loans : The Next Step*, Aberdeen, Aberdeen University Press.

\_\_\_\_\_ (1989), "Alternative Proposals for Student Loans in the United Kingdom", in Woodhall, M. (ed), *Financial Support for Students*, London, Kogan Page: 110-120.

\_\_\_\_\_ (1996) and Iain Crawford (1996), "Student Loans: Where Are We Now?", mimeo, May.

Blandy, R. (1992), *Lawyers' Incomes*, paper presented to the 23rd Conference of Australian Economists, Melbourne.

Chapman, Bruce (1997), "Conceptual Issues and the Australian Experience with Income Contingent Charges for Higher Education", *The Economic Journal*, Vol. 107 (442), May: 738-751.

Chapman, Bruce (1996), "The Rationale for the Higher Education Contribution Scheme", *Australian Universities Review*, Vol. 39, No. 1: 43-50.

Chapman, Bruce and Peter J. Stemp (1992), "Government Intervention in the Provision of On-the-Job Training", *Australian Economic Papers*, Vol. 31, No. 59: 354-368.

\_\_\_\_\_ and Damian Smith (1995), "HECS 5 Years After", *Current Affairs Bulletin*, January: 16-27.

\_\_\_\_\_ and T.T. Chia (1989), "Financing Higher Education: Private Rates of Return and Externalities in the Context of the Tertiary Tax", Centre for Economic Policy Research, Australian National University, Discussion Paper No. 213.

\_\_\_\_\_ (1993), "Income Contingent Charges for University: Theory, Policy and Data from the Unique Australian Experience", presented to the World Bank Conference, *Higher Education*, Manchester, United Kingdom, May.

Chia, T.T. (1990), *Returns to Higher Education in Australia*, PhD Thesis, Australian National University, Canberra

Friedman, M. (1955), "The Role of Government in Education", in Solo, A. (Ed), *Economics and the Public Interest*, New Brunswick, N.J., Rutgers University Press, pp 123-144.

Harding, A. (1993), "Lifetime Repayment Patterns for HECS and AUSTUDY Loans", National Centre for Social and Economic Modelling, Faculty of Management, University of Canberra, Discussion Paper No. 1.

\_\_\_\_\_ (1994), "Financing Higher Education: An Assessment of Income-Contingent Loan Options and Repayment Patterns Over the Life cycle", paper presented to the 23rd Conference of Australian Economists, Gold Coast.

Harrison, Mark (1995), "Default in Guaranteed Student Loan Programs", *Journal of Student Financial Aid*, Vol. 25, No. 2: 25-42.

Miller, Paul W. (1982) "The Rate of Return to Education: Evidence from the 1976 Census", *Australian Economic Review*, 3rd Quarter: 23-32.

\_\_\_\_\_ and Volker, P. (1993), "Youth Wages, Risk and Tertiary Finance Arrangements", *Economic Record*, Vol. 69, No. 204: 20-33.

National Board of Employment, Education and Training (NBEET) (1989-96), *Reports of the Higher Education Council on the Operation of the HECS Scheme*, Australian Government Printing Service.

Nicholls, Jane (1999), "Student Financing in the Developing World: applying income-contingent approaches to cost recovery", mimeo, Melbourne.

Romer, P. M. (1990), "Endogenous Technical Change", *Journal of Political Economy*, 98: S71-98.

Tan, Hong W. (1980), 'Human Capital and Technical Change: A Study of Wage Differentials in Japanese Manufacturing', PhD Thesis, Yale University.