THE STRUCTURE OF TERTIARY EDUCATION FEES

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CONTENTS

Summary

I Introduction
II The Analytic Procedure
III Marginal Cost
IV Differential Spillovers and Student Ability
V Labour Market Distortions
VI Summary and Conclusions

Page
i
1
2
9
14
22
26
SUMMARY

This paper is an attempt to apply the standard framework of conventional welfare economics to the question of tertiary education fees.

In section II, I indicate what that standard framework entails. Specifically, it isolates as the appropriate fee (in the absence of other relevant distortions) the marginal cost of providing the education minus any net marginal 'spillover benefit' (i.e. a net benefit from the marginal student's education not accruing to the student herself). I argue that information about the size of the latter element is unavailable, and necessarily the subject of conjecture: in other words; we have no firm grounds for deciding between alternative claims that the relevant spillovers are very large or that they are negligible. However, by making what I reckon are fairly plausible assumptions about the nature of such spillovers, I believe we can reliably claim that the standard framework has implications for the appropriate structure of fees - and it is these implications I develop.

In section III, the influence of marginal cost on fees is discussed. Since marginal costs under the best available estimates differ quite significantly among course (almost twice as much for medicine, say, as for economics), fees should differ among courses also - or at least should do so unless spillover benefits also differ among course according to differential marginal costs (which I find hopelessly implausible). Students should take into account the differing costs of alternative courses in making choices among them: if a student is indifferent between a course costing $4,000 and one costing $7,500 she should be encouraged to pursue the former. The logical way to do this is to incorporate cost differentials into fee differentials dollar for dollar. Fees should on the same basis be higher in the more expensive second and third years of a course than in first year.
In section IV, I discuss the question of fee differentials across students. My argument here is that students should be encouraged to go to university according to the probability that they will be successful and that this probability differs across students with different (measurable) intellectual capacities.

Section V considers the extent to which labour-market distortions and tax considerations might overturn the arguments for differential fees. My general conclusion is that they do not - and that indeed some of the arguments seem to be somewhat stronger when the obvious distortions are allowed for.

Section VI offers a brief concluding summary.
1 INTRODUCTION

What can conventional welfare economics tell us about university fees (and fees for higher education more generally)?

That is the question I shall be concerned with here. And I shall offer my answer at the outset. The justification for that answer will be spelled out in detail in the body of the paper. The answer is this. First, on the question of the level of fees, the theory cannot tell us very much because the empirical magnitudes on which the answer depends are unknown and arguably unknowable. This is not a failure of economics per se, since no other discipline can provide the right answer to the relevant questions either. What economics can provide - and this is not a negligible achievement - is an analytic procedure, a sort of grammar for talking about such issues; and this procedure is (potentially) extremely useful in maintaining conceptual clarity, in isolating those empirical magnitudes that are relevant and in exposing specious or incoherent arguments. Moreover, and this is the second strand in my answer, the procedure does suggest something about the proper structure of fees given some apparently reasonable assumptions, and it is on this aspect of things that I shall focus. Specifically, I shall argue that fees ought not be uniform across degree courses or students, but rather that the net fee should vary:

(i) positively with the marginal cost of the degree course involved;
(ii) positively with the failure rate in the degree course involved (after allowing for intake quality);
and (iii) negatively, across students, according to the student's matriculation score and subsequent university/college record.

The simplest way in which such a structure of net fees would be implemented would probably involve a system in which the fee in any programme were set according to criteria (i) and (ii); and then grants given to students according to criterion (iii), more or less in the same way as Austrudy allowances are currently given. As I see it, the arguments in favour
of having the net price of higher education vary according to the considerations listed above are certainly no less strong than those arguments that support differentiated subsidies according to parent-income, as the Austudy programme does. However, I do not want to discuss the Austudy programme\textsuperscript{1} - simply to argue the positive case for the fee structure I have indicated. I shall simply presume that Austudy, or something like it, will remain in force.

II THE ANALYTIC PROCEDURE

The point of departure for any discussion of this kind is the proposition that, in the absence of any other relevant "distortions" in the economy, the appropriate price for "consumers" to pay for any good or service is:

\[ P^*_x = MC_x - MSV_x \]  \hspace{1cm} (1)

where \( MC_x \) is marginal cost of providing the service

and \( MSV_x \) is the marginal value that non-users place on the user consuming that unit of \( x \).

I do not intend to argue for this proposition at this point. It is a well-established one in welfare economics and my object here is not to argue for standard welfare economics but to argue within it. Let me instead attempt to indicate what the proposition entails, because doing this serves to show what is at stake in the economist's analytic procedure more generally.

First, it states that in the absence of any spillover (or external) benefits or costs, the appropriate price to be charged for any good or service is the marginal cost of providing that good or service. In the case of higher education, this marginal cost includes both the cost of providing the higher education services per se (that is, lectures, tutorials, buildings, experimental facilities etc.) and the cost of the time taken up in availing oneself of those
services (most naturally measured by the income forgone by the student in attending university/college etc.). Because this latter component of cost is internal to the student it can in most instances simply be ignored in determining the appropriate fee: the marginal cost of providing the higher education service per se - what I shall call the direct cost - can be charged, and the student will simply net the value of income forgone out of her calculations in deciding whether to attend a higher education institution full-time or not. In the presence of spillovers, however, and specifically spillovers that differ among students, it may be necessary to take account of the fact that direct cost does not measure the full cost to potential students. That is, subsidies in excess of direct cost may be required in some cases; otherwise the composition of the student cohort may not be optimal. This is a matter that I will take up in greater detail in section IV below. At this point, what is to be noted is that, in the absence of spillovers, marginal cost pricing is the conceptual ideal. Consequently, one important element in deciding on the appropriate fee structure is the determination of this marginal cost. And if marginal cost varies according to the nature of the course undertaken, as it almost certainly does, then there will be a strong presumption in favour of differential fees - a presumption that we shall explore in section III below.

The second step in the economist's analytic procedure is to specify the nature and size of the relevant spillovers or "externalities". And it is in this that much of the real action lies. It is for example sometimes remarked that the basic rule of thumb in economic analysis of this kind is: cherchez les externalites. The aphorism is apt. For in the absence of any marginal spillovers, there would be no particular case for government involvement at all - except possibly to ensure that monopoly elements did not establish too wide a divergence between price and marginal cost. Moreover, it is the magnitude of the spillovers generated at the relevant margin (per additional student, per additional year of education or whatever) that determines the appropriate departure from marginal cost.

All this is of course standard fare to the economist. But what the profession has perhaps not adequately emphasised is that these marginal spillover benefits are often
unknown and in many cases unknowable. Or, more strictly, information about them is not accessible in a manner that economists normally accept as legitimate. "Cherchez les externalités" may be the right instruction, but we have no way of following it. For it is of the nature of the externality that the magnitude of those externalities is not revealed in individuals' market behaviour. The sum that individuals (other than the student and his immediate family) would be prepared to pay in order to send an additional student to some institution for higher education - the net marginal benefit that the community at large derives from higher education - is by definition not directly reflected in market prices. In some cases - possibly a small minority - evidence about spillover benefits can be obtained indirectly from market prices: for example, it may be possible to measure the value of clean air by comparing the prices of otherwise similar houses in dirty and clean locations. But in many cases, this sort of indirect information is simply not available.

Consider the case in point. The direct benefits of higher education to the successful student are clear enough. They consist of: the additional income that the graduate obtains by virtue of being a graduate (the "personal income" return); the durable consumption benefits derived from the enhanced capacity to enjoy intellectual pursuits of one kind or another (the "intellectual" return); and the present consumption benefits derived from the social amenities that membership of the relevant institution allows (the "good time" return). The spillover or external benefits that are sometimes enumerated are:

(i) the benefits from living in a more educated community (e.g. lower crime rates; better public decisions; pleasant conversational ambience etc.);

(ii) the benefits that more highly educated persons may generate from research or additions to the stock of human knowledge - which the generators cannot fully appropriate in the form of financial rewards;

(iii) the benefits that accrue to fellow-workers of more educated/more skilled workers from imitation and emulation.
In my view, the latter two possibilities are rather questionable. It is, for one thing, not clear why, if an educated person (or persons) generates increased output from fellow-workers, it will not increase a firm's profits to hire educated persons and hence increase that firm's demand for educated persons in a way that will ultimately be reflected in their (higher) wages. Of course, it may be that these benefits from emulation and imitation are not confined to the employing firm, but spill over onto other firms in the industry. If this were so, productivity of unskilled workers in each industry (and/or industry profits) would be positively related to numbers of graduates in the industry in a manner that should be econometrically demonstrable. I know of no evidence that supports this claim. And if such effects were present and emulation/imitation were an effective means of transmitting the economic benefits of higher education, then this might argue for fewer rather than more graduates: emulation/imitation is cheaper than higher education, and if we can get most of the economic benefits by the former route, we should not use the more expensive one.

At first sight, the second kind of spillover ([ii] above) seems more promising. It certainly seems persuasive to argue that research, particularly of a "fundamental kind", generates benefits of a type that it is difficult for the researcher to appropriate fully as higher salary or patentable discovery. But this does not constitute an argument for subsidising higher education per se, so much as the research activity itself. Not all graduates do research, and it would seem highly inefficient to subsidise all students because some small proportion of them may continue into research activities. The appropriate response to any such externality is to pay higher salaries to researchers - and particularly successful ones.

Such considerations throw us back on category (i) benefits to do most of the work in justifying public subsidies for higher education. And this presents us with a major problem, because the conventional tools of economics provide us with no access to information about the size of such benefits. To discern these externalities we would have to be able to read agents' minds, and this is an exercise which modern economics has insistently categorised
as idle speculation (in the absence, that is, of authoritative evidence from the relevant agents’
behaviour - which evidence is in this case conspicuously absent). Because the issue of
spillover size is so central, however, it might be necessary to canvass less orthodox sources
of information. It would, for example, be possible to ask some random sample of
taxpayer-voter-citizens the value they place on an additional graduate (not themselves).
Somewhat surprisingly, however, this is almost never done; and though we might concede
readily enough that this sort of questionnaire data about hypothetical choices is extremely
unreliable (as economists have always claimed), nevertheless it may turn out to be the best
evidence available. Alternatively, one might argue (as I have myself in another place,
Brennan (1984)) that the fact that voters have been prepared to countenance large subsidies
to higher education for a long period over many elections is some evidence that the spillover
benefits from higher education are not negligible. After all, so the argument might run, if
taxpayers are prepared to pay for higher education subsidies, as they seem to be the world
over,3 election after election, they must see themselves as benefiting from the expenditure
to some extent. But I now reckon that this line of reasoning probably concedes too much to
the optimality of political processes.4 In any event, it leads to the rather unhelpful advice
that, if one can get away politically with a particular fees regime (or any particular change in
fees) then that regime (or the change in it) must be optimal. This is hardly a satisfactory
reference point for the independent evaluation of policy proposals. The line of reasoning
does serve to remind us, however, that the status quo is not entirely arbitrary (something
which some reformers would have us believe).

The “bottom line” of all this is that no-one can assert with any authority that any
particular level of fees is the appropriate one. All we have to offer are our conjectures, and
these conjectures should not be seen to carry much in the way of professional authority. We
simply have to confess our ignorance on the crucial issue of how large the relevant
externalities are. For what it’s worth, my own guess is that, at the margin currently
applying they are quite small.5 The marginal aspect may be important here: the issue is not
whether higher education generates external benefits in toto, but whether those benefits are significantly increased (diminished) if more (fewer) students are taken through to the tertiary level. My guess is that those benefits would not be significantly altered - but my central point is that this is a guess and should be recognised as such.

I have spent some effort in spelling out these informational/epistemological problems, because they are an important influence on the focus of this paper. I believe that while we may be able to say relatively little that is authoritative about the appropriate level of fees, we can say something about the appropriate structure of fees on the basis of assumptions (about the nature of any external benefits) that are rather weaker than assumptions about aggregate size. Specifically, I shall assume, first, that marginal spillover benefits are essentially identical across all courses of equal length at academically equivalent institutions - so that a three-year B.Sc., B.A., B.Ec., B.Comm. from a recognized university generate identical marginal spillovers. And second, I shall assume that spillovers are significantly higher for courses successfully completed than for courses "failed". Neither of these assumptions is unquestionable, and they turn out to have fairly strong implications for fee structures, but I shall postpone such defense of them as I can construct until section IV.

At this point in the argument, I wish to draw attention to two further aspects of the standard analytic procedure. The first is that it presumes that individuals are capable of making appropriate choices with respect to their consumption of the good, once the ideal price, $p^*$, has been set. This is not an undisputed claim in the education case: the argument is often made that one cannot properly appreciate the benefits of education until one is educated, and hence that public policies to encourage consumption of education might receive ex post support even though ex ante the choices they encourage would not otherwise have been made. This argument clearly represents a conceptually distinct line from the externalities one: the justification for public intervention is not that persons other than the direct consumer benefit, it is rather than the consumers themselves benefit though in a manner that they cannot ex ante perceive that they will. The standard analytic procedure
effectively denies that possibility. It may recognise that individuals can misperceive the benefits of alternative actions, but denies that governments (or political decision-making procedures) have any systematic comparative advantage in perception, and tends to see government intervention on this basis as an invitation to authoritarianism. In my view, the standard procedure is considerably more robust on this than it might at first appear. There is no shortage of advice, nor of well-educated "models" for the potential student to consult. And while academics of all kinds tend to believe that the life of the mind has an intrinsic value and should be supported for its own sake (and whatever the uncultured masses think it's worth), it is rather difficult to rationalise this view as allowing for inadequate information on the part of potential students: the pro-academic view may well be simply an exercise in paternalism by the intelligentsia (and one which democratic politics can in no way be presumed to support). Moreover, one might argue that there are considerations that go precisely the other way - not least the tendency for current students to over-estimate the future income increments attributable to higher education by extrapolation from the current age-profile of graduate incomes. On balance then, my view is that the standard procedure, in taking individual students to be the best (though not necessarily perfect) judges of their own interests and purposes, makes the best available working assumption. However, to the extent that this claim is disputed and that the effect of relevant misperceptions is that too few students proceed to higher education, an independent case for some public subsidy could be mounted. I accept such a case in principle: I regard it as a weak one in practice. The second aspect of the standard analytic procedure that needs emphasis here relates to the phrase used in the opening sentence of this section "... in the absence of any other relevant distortions elsewhere in the economy." All conclusions drawn must be subject to that proviso. And in the current context, the proviso is an important one, both because labour markets are encrusted with several layers of regulation and restriction and because, in dealing with an issue like human capital acquisition, the effects of the tax system are particularly relevant. Whether these considerations affect the basic thrust of my argument about fee structure is a matter I shall explore briefly in section V below.
With all this as background, we shall turn to a consideration of what the basic proposition (equation (1) above) implies about fee structure. We shall consider the two terms on the right hand side of that equation in turn - marginal cost in section III, and marginal spillover benefits in section IV, with an eye to the question of how these differ across courses and across students. Section V considers very briefly the role of labour market "imperfections", including the effects of the income tax system, and section VI offers a brief conclusion.

III MARGINAL COST

Let us note at the outset that in some cases it is not necessary to enquire as to what the level of marginal costs is. If industry structure is sufficiently competitive, market prices will automatically tend to approximate marginal cost. Accordingly, if (as seems plausible) the analyst can discern whether an industry is reasonably competitive or not, there is no need to become embroiled in the extremely complex business of unravelling the cost structure of individual firms. Moreover, if the industry structure is sufficiently competitive, the optimal price, set out in equation (1) above, can be achieved by giving each student a subsidy equal to the marginal spillover benefit (MSV) that she generates and simply allowing firms to set what prices they like. The Australian tertiary education sector, however, is probably too small and demand too localised geographically for competitive forces to be relied upon to drive prices to marginal cost. Each institution has something of a local monopoly, and the prospects for cartel formation are significant. In the market for foreign "full-fee-paying students" (FFP), for example, it seems clear that fees have been set well above true marginal cost: there is no allowance for the research component of staff-time, and fees seem to have been derived from average rather than marginal cost calculations. The enthusiasm with which many institutions have embraced the possibility of FFP students suggests that in the short run there are rents to be had which can be used to cross-subsidise other activities. Moreover, since most of the available evidence indicates that marginal cost lies below average cost, there appear to be increasing returns to scale in
the tertiary education sector which may involve problems for the stability of a competitive regime, and/or for the feasibility of marginal cost pricing.

If institutions cannot be expected to charge marginal costs as an automatic result of competitive pressures, then some independent estimate of marginal cost per student will be necessary. For the purposes of the current discussion, I shall be content to use the estimates obtained recently by Throsby (1986) in his discussion of the foreign students issue. Although, doubtless, argument could be brought to bear on whether his estimation procedures are totally satisfactory, the figures he derives appear to me to be quite authoritative enough for the present illustrative exercise. Specifically, Throsby's calculations do make a sensible attempt to do the three things that seem absolutely obligatory: first, to distinguish between average and marginal costs; second, to make some allowance for the resources used in research as distinct from teaching (even broadly defined); and thirdly, to distinguish among types of courses and fields of study according to the different needs for equipment and equipment-related support staff. In the latter connection, Throsby distinguishes three broad categories of field, and focuses his attention on universities. I shall follow him in both respects. His estimates of average and marginal cost, both gross and net of research resource are set out in Table 1 (at 1987 prices). The relevant figures are shown in the last row of the table. I have rounded all figures to avoid a spurious impression of accuracy: only orders of magnitude are relevant.

Two aspects of this table are worth emphasis. First, as mentioned above, average cost lies above marginal cost for all course-types (and in toto). Hence, even in the absence of externalities of the standard kind, marginal cost pricing will require some government subvention to cover losses. This subvention will amount to roughly 25 percent in the case of low-cost degrees (arts, commerce, economics etc), 50 percent in the case of medium-cost degrees (natural and physical sciences) and 40 percent in the case of high-cost degrees (medicine, engineering, agricultural and veterinary science, dentistry etc). Of course, it may be argued - persuasively in my view - that the cost structure within universities is itself
highly dependent on the institutional arrangements and that these may change somewhat under a fees regime. If such cost-structure effects are significant enough, it may even be that the decreasing cost elements in the industry will disappear. At least, they may well be moderated - and in that sense the particular subsidy rates implied by Table 1 must be regarded as provisional and would have to be kept under review. Nevertheless, it is worth emphasising that, as things currently stand, quite significant government subvention from public revenues would seem to be required just to permit marginal-cost pricing for the teaching function even if all marginal externalities were taken to be negligible.  

**TABLE 1**

**COST ESTIMATES FOR UNIVERSITY PLACES**

($ per EFTS at 1987 prices)

<table>
<thead>
<tr>
<th>Types of Degree</th>
<th>Average</th>
<th>Low-Cost</th>
<th>Medium-Cost</th>
<th>High-Cost</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research-inclusive</td>
<td>12,500</td>
<td>8,500</td>
<td>16,000</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>Marginal</td>
<td>8,125</td>
<td>6,250</td>
<td>10,000</td>
<td>12,250</td>
<td></td>
</tr>
<tr>
<td>Teaching only</td>
<td>6,900</td>
<td>5,400</td>
<td>9,000</td>
<td>11,250</td>
<td></td>
</tr>
<tr>
<td>Marginal</td>
<td>4,600</td>
<td>4,000</td>
<td>4,500</td>
<td>7,000</td>
<td></td>
</tr>
</tbody>
</table>

Second, it is notable that marginal costs differ - even for the teaching-only component - across courses of different types: these differentials should be reflected, *ceteris paribus*, in fees for those courses. The *ceteris paribus* assumption here is taken specifically to exclude the possibility that marginal spillovers differ across courses in just such a way as to offset marginal cost differentials. It would seem to be quite uncannily convenient if marginal cost and marginal spillover benefit differentials were exactly offsetting, and there
are certainly no plausible arguments at hand to justify any such claim. However, for the purposes of the argument here (and for reasons outlined in section IV) I shall make the stronger argument that marginal spillovers should be taken to be identical across courses. If this is accepted, then it follows that it is the absolute not the relative differentials in marginal cost that should be reflected in fees. That is, whatever the (assumed common) MSV is, the appropriate difference between low-, medium- and high-cost degree courses will remain $500 and $3,000 respectively (at 1987 prices). Accordingly, the larger marginal spillovers are taken to be (and hence the smaller ideal fees are on average) the larger the relative differential between most expensive and least expensive course types. For example, if the marginal spillover is taken to be $2,500, the fee structure would be: arts $1,500; science $2,000; medicine $4,500. If the marginal spillover is $3,500, the fee structure would be: arts $500; science $1,000; medicine $3,500. And so on.

What are the advantages of such differences in fees? They are the same advantages as those of marginal cost pricing more generally - but here several are worth specific mention. First, there are the effects on student demand. If students are indifferent between a course that costs (at the margin) $5,000 and one that costs $10,000, it is bad economics to encourage students to take the latter unless there are independent reasons for doing so. That is, if we can produce two commerce graduates for the price of one doctor, and if the spillover benefits associated with additional doctors are no larger than those associated with additional commerce graduates, then it is more efficient to put the resources into the lower cost course. Second, and relatedly, if academic ability (matriculation performance or equivalent) is used to ration higher education places, as is currently done, then the allocation of students across various fields tends to be distorted. For example, a student who would only very mildly prefer medicine to science will tend to enrol in medicine, while a student whose matriculation score is somewhat lower will have to enrol in science even though he would very much prefer medicine. If those students were permitted to exchange entrance permits - together with appropriate side-payments - both could be made
better off: the less able student would do medicine, the more able would do science. The current system has the characteristic feature that the most able and talented students are disproportionately represented in areas where there is high excess demand, which tend to be those areas where the implicit subsidy is largest. A regime of fees differentiated according to marginal cost would move some way towards correcting this imbalance.

Thirdly, as universities become more and more dependent on 'private' sources of revenue - and fees specifically - there will be a tendency for them to move away from higher cost towards lower cost fields. If an institution can obtain a student fee of $2,000 by providing either a course costing $4,000, or a course costing $6,000, it will naturally tend to prefer the former. Unless fees are somewhat higher for more expensive programs, those more expensive programs will tend to wither, even though there may be considerable demand even at the higher fee level.

Now it may be tempting to respond to this general argument by insisting that the marginal cost principle be extended to, say, the level of individual courses, and hope to produce thereby a sort of reductio ad absurdum. If, so the argument would go, one is to adopt marginal cost pricing why not charge students who take courses with small numbers or that involve intensive academic attention concomitantly higher fees (so that, for example, honours students who may absorb more than the equivalent of one full lecturer load should be charged a fee of up to, say, $70,000)? No commitment to such draconian procedures is necessarily involved however. Some cross-subsidisation of courses will always be desired by institutions on "academic and intellectual grounds"; but the sort of rough-grained differential fee schedule here outlines seems to be what economic logic requires - at least in the absence of strong countervailing argument.

One particular question that arises in this connection is whether fees ought also be differentiated across years of a programme. Even allowing that there may be high degrees of complementarity in provision of first- and later-year courses, it does nevertheless seem
clear that the cost of providing additional later-year places, with their more refined options and lower student-staff ratios, is likely to be somewhat higher than the cost of providing first-years places. Of course, for students who proceed through the entire programme, there is very little at stake - merely a transfer of costs among years. But not all students are successful; and what each pays to "chance an arm" in a programme is not irrelevant for ensuring optimal outcomes. Specifically, the number of students wanting to attempt first year will be influenced by the fee charged for that year and to achieve optimal enrolments in first year requires a fee that reflects the marginal cost of the programme in that year. There is a countervailing consideration: first-year students have, ceteris paribus, lower probability of success than later-year students and, as I shall argue in the next section, probability of success is important in determining spillover benefits but differential probability of success across students/years is a matter that is better handled by differential student grants - not differential fees. If marginal cost is lower in first-year than later-years, first-year fees ought to be lower also. Precisely how marginal costs vary across years in fact is a matter on which little work has been done (to my knowledge) but on the basis of back-of-the-envelope guesses, I would place the ratio of first- to later-year unit costs at about one to two. This would imply that one-fifth of the cost of a three year course should be charged in first year, and two-fifths in each successive year.

IV DIFFERENTIAL SPILLOVERS AND STUDENT ABILITY

We now turn to a consideration of the second relevant element in the 'optimal' price equation - the spillover benefit, MSV. At the outset, let me re-emphasise the central conclusion of the discussion of this matter in section II: that is, that although some assumptions about these spillovers are necessary if specific policy proposals are to be derived, any such assumptions necessarily contain a substantial element of conjecture and hence ought to be as weak and general as possible. The specific assumptions I shall make are:
1. uniformity of spillover benefits across academically equivalent courses;
2. significantly higher spillover benefits for courses successfully completed than for courses "failed."

There are, of course, by the nature of my argument, problems intrinsic in any attempt to justify these assumptions. Once it is accepted that the size of spillovers is unknown, there may not seem to be much more that can be said. There is at least this: as a mere matter of intellectual procedure, one wants to avoid an ex post "calculation" of the size and structure of spillovers in order to rationalise some specific practice. If any policy, however eccentric, can be justified by some assumptions about spillovers, and if "analysis" proceeds by working out what those spillovers would have to be in order to justify that policy, then the analysis is useless: nothing can be rejected. One would want the analyst, at the very least, to examine the question of the size and structure of spillovers before considering, and with a calculatedly blind eye to, any policy implications if the analysis is to inform decision-making at all. In that sense, the assumption of uniform spillovers seems to have some natural claim to neutrality. Moreover, if there is a high level of substitutability among alternative courses/programmes in generating spillovers, then the assumption of uniformity follows automatically - and for the sorts of general spillover benefits that seem to be at stake here (cultural ambience etc.) a substantial degree of substitutability seems inevitable. Of course, a degree in medicine is not a perfect substitute for an art degree in the market-place, and the relevant externalities would not be perfect substitutes either if they arose in work-related contexts. But as those externalities become more general - whether of the cultural ambience variety, or of the generalized "speed-of-adjustment-in-markets" type that seems to be enjoying some current popularity - the argument that we require a specific mix of degrees to obtain the highest level of spillover benefit and that this mix is very different from the one that would arise from student choices, seems rather difficult to sustain. Accordingly, uniformity of spillover, although not indisputable, does seem entirely reasonable. In any event, the main work this
assumption does in my analysis is to establish the relevance of marginal cost differences, and in that sense the uniformity assumption is itself too strong. However, in the absence of any persuasive argument to the contrary, the stronger assumption seems to me appropriate.

For the argument to be developed in this section, it is the second assumption (2 above) that is the relevant one - and it seems to me self-evident. Certainly, the discussion in the current Green Paper on higher education presupposes it - as we might induce from their treatment of graduation rates; or from their citing with apparent approval, the Murray Committee's view that 'a high failure rate is a national extravagance'. The assumption does not require that spillover benefits be zero for students that fail. Nor does it deny the possible (occasional) case in which a student who fails may derive greater intellectual benefit from university than one who passes. But as a general proposition, it seems to me to be difficult to reject.

If we take this second assumption as given, then the basic logic of the welfare economics argument requires us to differentiate among students according to the probability of success. That is, the appropriate subsidy, $S_i$, to be paid to any student is:

$$S_i = P_{ij} \cdot MSVG$$

where $MSVG$ is the marginal spillover benefit generated by a Graduate
and $P_{ij}$ is the probability of the $i^{th}$ student's graduation in course $j$.

The implication is that subsidies should vary both across students and across courses. Consider the latter element first. If wastage rates are higher in economics/commerce than in arts, or in engineering than in science after making proper allowance for differential academic competence (matriculation cut-offs) then subsidies should be higher (i.e. fees lower) in the field that produces more graduates per student, other things being equal. Two amplifications are required here. First, on the allowance for differential cut-offs. The notion is that a student with given academic credentials who has a higher chance of graduation in
one field than in another should be appropriately encouraged to enter the field in which the probability of success is higher. Equivalently, if it takes on average two first year students from a given quality cohort to produce one graduate in field A and only 1.5 to produce one graduate in field B, then field A is the more expensive route to producing graduates, and the net fee should be correspondingly higher in that field. To calculate the relevant fee differential we cannot simply look at wastage rates as historically determined. Even allowing for differential cut-offs is not adequate, since the distribution of matriculation scores within the cut-off may vary. To apply formula (2) properly across fields requires, in fact, information that is not currently available, and it is conceivable that relatively small variations in fees would be implied. But it is clear that wastage rates within institutions do vary considerably across course and in a manner that cannot be entirely explained by the differential intellectual capacities of students.

The second (and in my view more significant) element of the variation in subsidy implied by (2) is, of course, that students with a higher ex ante probability of success should, ceteris paribus, receive higher subsidies - in proportion to that probability. At entrance to college/university, the best ex ante measure will presumably be matriculation performance (or some equivalent measure of educational attainment) possibly modified by any other indicators that are good predictors of success. Thereafter, performance at the end of first-year will presumably become the measure for probability of success in second-year, and so on. It would therefore be expected that a structure of subsidies in first-year university might be something like that indicated in Figure 2. (And subsidies for colleges of advanced education where probability of success might conceivably be higher at any given percentile ranking would ideally attract appropriately higher subsidies, at least at the lower end, so that a student would have an appropriate incentive to enrol in the course of study where her probability of success is highest.) Later-year subsidies would be somewhat higher and more uniform, reflecting the higher and more uniform probability of success for students who satisfactorily complete their first year.
TABLE 2

ILLUSTRATIVE STRUCTURE OF SUBSIDY

<table>
<thead>
<tr>
<th>Matriculation Performance</th>
<th>Amount of Subsidy $ p.a.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 5% (0-5)</td>
<td>7,000</td>
</tr>
<tr>
<td>Next 10% (6-15)</td>
<td>5,000</td>
</tr>
<tr>
<td>Next 10% (16-25)</td>
<td>4,000</td>
</tr>
<tr>
<td>Next 10% (26-35)</td>
<td>3,000</td>
</tr>
<tr>
<td>Below 35%</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Note that under the projected scheme, the subsidy would be able to be used towards both the cost of fees and living expenses and would be independent of field - so that a student in the top 5% would if she did medicine find that all of her scholarship went in fees, whereas if she did science she would have some amount left over for living expenses.

Now, it is sometimes argued that the relevant determinant of the 'value of education is the 'value-added', and that this is larger for less able students. The claim here is basically that intelligent individuals will tend to have higher incomes anyway and that less able students can to some extent 'catch up' on the more able by being more highly educated. The arguments here are somewhat speculative: to my knowledge, there is no compelling empirical evidence on the subject. But if there is anything to this argument, it seems to be primarily relevant to the purely private return (measured in terms of higher income accruing to the individuals concerned) and much less to the social benefits to which education putatively gives rise. Whether these 'value-added' considerations are more significant than 'probability of success' considerations can then be judged by the actual behaviour of school leavers: if value-added considerations predominated, then participation (among qualifiers) in higher education should be higher at the lower rather than the higher end of the
matriculation score spectrum. It is not. Which is not to say that such value-added consideration are irrelevant - merely that they are not as significant as 'probability of success' considerations and become even less significant when we focus on spillover rather than private returns. Accordingly, we shall presume that something of the sort illustrated in Table 2 should prevail. The precise structure would, of course, depend on establishing the relation between matriculation performance and probability of success in first year.¹¹

At this point, let me raise an additional issue by way of defending a subsidy structure of the kind recommended. It relates not to efficiency, but to equity. Under the present scheme we already have a system of subsidies differentiated according to academic prowess: full cost subsidy to those above the matriculation cut-off for any discipline; and effectively an infinite tax on those below the cut-off since they are barred from entry. As a result, individuals who are almost identical in t.e.s. performance are treated vastly differently. And there is no justification for such significant differences in terms of differential probability of success; graduation rates would not alter if access were allocated by ballot to students within 3 per cent on either side of the cut-off.¹² If it is agreed that equity requires that almost identical cases should be treated almost identically - which is a natural extrapolation of basic horizontal equity principles - it seems clear that the current system of allocating tertiary education places is highly inequitable, and moreover that such inequity is an artifact of the system of subsidies and not an inherent feature of the need to ration places. The scheme I have suggested greatly modifies such inequities because it treats students with equal likelihood of success much more equally.

In suggesting the scheme of differential subsidies across students that I have here, it should be clear the I have made assumptions about who should bear the risk for lack of success. It would, for example, be entirely possible for the government to pay a subsidy (equal to MSVG) only to successful students - for example, by paying students the determined sum when they pass a course, or more generally at the time of graduation. Then students themselves would bear the full risk of non-completion just as they would
under a full-fee regime. Given the decision to offer subsidies, why not subsidise those who actually deliver what society at large putatively values - namely, a degree? What is at stake here is precisely the question of who should bear the risk of a particular student’s failing - or more accurately, in what proportions those risks should be borne. Note at the outset that the individual student bear a significant risk under either ex post or ex ante subsidy\(^{13}\) to the extent that the student forgoes income to attend university; and furthermore, that if subsidies are (on average) less than fees, students will bear more risk under an ex ante subsidy scheme than at present. What the ex ante subsidy scheme involves (as compared with the ex post alternative) is a kind of limited insurance scheme among students, so that the risk of failure is pooled. Of course, different students represent differential risks and would face differential premia, which is why the ex ante subsidy should differ among them. In any such insurance scheme, there are moral hazard and adverse selection problems: students with low motivation (for example, those who focus on the good life that university offers) will tend to be over-subsidised; and students will arguably work less hard than they would under the ex post subsidy arrangement. Moreover, in the absence of any market failure in insurance markets of this kind, the fact that no such insurance market currently exists (either in Australia or in other places such as the US where tertiary fees are often substantial) would provide decisive evidence that students do not have an effective demand for it. However, assuming away the possibility of market failure rather begs the question. My experience here is that, in casual conversation, students do indicate a systematic preference for the ex ante arrangement; yet there seems little independent evidence of major moral hazard/adverse selection problems (for example, when fees were abolished in 1974 there was no resultant detectable increase in failure rates). It will perhaps be clear from my discussion of this matter that I am somewhat ambivalent on it. The case for ex post subsidisation rather than ex ante is conceptually strong - yet I cling to the ex ante subsidy scheme that I have outlined because students say that that is what they prefer.
Finally, accepting the principle of differential subsidies across students, the issue arises as to whether the subsidy should also be related to institutions. That is, if graduation rates in a given program are higher at institution A than at institution B even after allowing for differential matriculation cut-off, it seems plausible to conclude that it is cheaper, ceteris paribus, to produce graduates in institution A, and that students in that course at institution A should receive a higher subsidy. Students would be appropriately encouraged to go to institutions where their probability of success was higher. And presumably, there would be incentives within institutions to improve teaching and increase graduation rates thereby. However, given the absence of clear measures of the quality of degrees, it would also provide institutions with the incentive to pass more students by lowering the required standard, and it is difficult to see how this could possibly be desirable. Consequently, while there can and should be differentiation across broad areas of study according to probability of graduation, it does not seem appropriate to differentiate between institutions on this basis. If a scheme of differential subsidies across institutions were to be taken seriously, consideration would have to be given to separation of the teaching from the certification function (e.g. syllabuses agreed, and performance evaluation undertaken by some body or bodies distinct from the teaching one). Such separation has major attractions. There seems to be no compelling reason why institutions that provide examining facilities must also provide tuition - still less why students who wish to use the examining facilities should be forced to accept tuition at the same institution. There is a strong general presumption in economic orthodoxy against such 'tie-in sales', and it seems to me to be compelling here. But my point here is a subsidiary one - that separation of examining from tuition functions would be absolutely obligatory if fees policy were to take account of differential success rates for equally qualified students in the same courses across different institutions. In the absence of such separation, institutional variation in subsidies simply encourages deterioration in standards.
V LABOUR-MARKET DISTORTIONS

To this point, I have argued that the basic logic of conventional welfare economics supports a structure of fees that varies positively with marginal cost and negatively with success rates, and a set of subsidies/scholarships that vary positively with matriculation performance. This logic does, however, depend on a crucial proviso: that relevant distortions elsewhere do not lead to effects in the 'human capital' market that would overturn the arguments for that structure. Now, there is, as is well-known, a significant array of institutional barriers in Australian labour markets. If these barriers serve to hold wages for graduates down to artificially low levels (or equivalently, wages for non-graduates are held artificially high) then the returns to higher education would be squeezed. If it were impossible to attack the relevant institutional barriers directly it may be possible to modify some of the distortions by offering (increased) subsidies to higher education. I say "may be" because the political constraints that encourage policies to reduce wage relativities may not be capable of being so easily avoided. In any event, the relevant issue for my purposes here is not whether such distortions would justify subsidies to higher education generally, but whether they suggest differential subsidies across courses or students that would modify or amplify the differences the earlier discussion requires.

My guess on this is that the most significant barriers in the labour market are relevant at the non-graduate level and operate to keep non-graduate wage rates artificially high. This reduces the income gain associated with higher education, and makes a possible second-best case for some general higher education subsidy. More to the point, the income differential is reduced relatively more for lower-income graduates: and in anything like a long-run equilibrium, those lower-income graduates will be those for whom the marginal cost of education is lowest. Consequently, the presence of labour market distortions probably strengthens the case for subsidies differentiated according to marginal cost, since those courses where marginal cost is lowest will tend to exhibit artificially lower income gains.
The other potential source of distortions that bears is the tax system. Here, there are three questions. First, does the fact that the income increases derived from higher education are taxed make a case for subsidising higher education? Second, do the general leisure-effort and other distortions induced by the tax system make a case for subsidising higher education? Thirdly, do these arguments in any way modify the structure of subsidies derived on spillover-benefit grounds? I address these questions in turn.

The notion that taxes on income are likely to discourage the acquisition of human capital is a natural extrapolation of arguments relating to the disincentive effects of tax more generally. It is certainly true that the student who computes the benefits of the additional future income he will derive from a degree will rationally calculate that additional income net-of-tax. This will reduce the rate of return to him by a proportion equal to the marginal tax rate he confronts over the relevant income range. The private rate of return will be lower to this extent, and hence fewer individuals will find it privately profitable to make the investment in themselves. Accordingly, so the argument goes, government will need to subsidise that investment: the tax paid by the individual does generate (social) benefits, it is simply that those social benefits accrue to citizens other than the individual himself. Several things need to be said about this argument. First, the reasoning applies as much to the acquisition of physical capital assets as to human: the analogous argument has never been offered in the savings/investment context. And in the absence of analogous provisions for physical capital, there is a clear danger of distorting the aggregate capital stock in favour of human and against physical capital. Second, even in the presence of full fees, human capital would be treated generously in relation to physical capital. For note that the true economic investment at stake in human capital acquisition is the cost of providing the education plus the income forgone while attending the educational institution. To treat human capital in a way symmetric with physical capital would require us to tax the "principal" in both cases— that is, to allow no tax deduction in the human capital case that we do not allow in the case of physical assets. This would require, in turn, that the tax payable on the income that the
student could have earned while attending university/college be a charge to the student (and further that there should be no deduction for fees paid, except as and when the human capital depreciates - at retirement, for example). Of course, the issue of paying tax on income not actually earned is a controversial one and, as in the case of imputed rent on owner-occupied housing, rarely commends itself to the taxpaying public. However, as in the housing case, there tends to be a distortion in the composition of the capital stock if different asset forms are not taxed symmetrically, and there tends to be unfairness in the treatment of individuals who differ only in the form their savings take.

Thirdly, although it may be true that the government reaps a return from individuals’ acquisition of human capital, to make this an argument for subsidising that acquisition is to undermine and possibly abort both the net progressive effect of the income tax and the raison-d’etre for any taxation at all. An individual who does not go to university pays for public goods through his taxes: an individual who does go to university merely pays for the subsidy that he himself has already received. Or, better put, to calculate his net contribution to public goods, the cost of his free higher education should be netted out of his tax payments. The crucial question in all this is whether it is better to meet the distorting effects of taxation - both in connection with human capital acquisition and more generally - by subsidising higher education or by having no subsidy and lowering tax rates. On distributional grounds, the latter seems the superior alternative, since one can in principle lower tax rates at any income level (and specifically at the bottom end). On efficiency grounds, the balance of argument is unclear. It may be that human capital is complementary with effort - after all, one has to work to obtain the income benefits of higher qualifications - and hence that subsidising human capital induces a more industrious work-force, partially offsetting the effects of taxation in work-effort choices. Or it may be that the chief effect of higher education is to secure more congenial as opposed to more arduous jobs and that subsidising higher education actually exacerbates the already present disincentive effects of taxation against effort.
In short, although the fact that taxes may distort human capital decisions (just as they may distort leisure-effort choices) provides an argument for possible "second-best" adjustments in tax arrangements, the need for such adjustments cannot logically be met by abolishing taxes - or by removing their effects on decision-making by exactly offsetting subsidies. The question of the extent to which taxes affect occupational choice and hours of work is a controversial one in itself and the empirical evidence is inconclusive: to my knowledge there is no evidence to support the view that changes in tax arrangements influence decisions on higher education, or more to the point that leisure-effort choices are influenced by human capital acquisition. In the absence of such evidence, almost everything depends on where one takes the onus of proof to lie, but general theoretical presumption favours no subsidy and minimal taxes, rather than subsidy plus higher taxes. In any event, the general division of intellectual labour in policy analysis, it seems sensible to try to leave the task of minimising tax distortions to tax reform policy, rather than have every area of policy attempting to make allowances for inadequacies in other areas.

The crucial issue for current purposes is, however, not whether tax considerations argue for larger or smaller subsidies but whether they bear in any way on the arguments already advanced for the particular structure of subsidies that I have proposed. If anything, they would seem to argue for larger subsidies to (and/or additional places in) those areas where income returns and hence tax distortions are highest. We have very little in the way of information about which those areas currently are, though one could perhaps conjecture safely that medicine, law and commerce are among them. In long run equilibrium, such areas will tend to be those where marginal costs of training are highest, so this line does modify the argument for differentiation according to marginal costs - though only to the extent that marginal tax rates differ over the range of different graduate incomes.
VI SUMMARY AND CONCLUSIONS

In this paper, my main object has been to argue a case for a particular structure of fees for higher education institutions. I have not sought to argue any case for a particular level of fees, because to do so requires a judgement as to the magnitude of the marginal spillover benefit generated by higher education and because making such a judgement involves substantially arbitrary conjectures which I have here sought to avoid. There is however something that emerges on the level question. Even if all spillovers were zero, the available evidence indicates that higher education is - at least as currently organised - a "decreasing cost" industry; hence, if marginal cost pricing is desired, a subsidy of roughly one-third of the cost per student would seem to be required. Any allowance for spillover benefits will increase the magnitude of that subsidy.

But my chief concern in this paper has been otherwise. My guess is that what is likely to emerge from current deliberations (and from the politics of the issue - both within the ALP and more broadly) is some compromise on average fee level, with most of the attention on the structure of fee differentials being focussed on equity matters. I reckon we can do better than this. There are efficiency considerations that bear on the structure of fees, and the sorts of assumptions about externalities that are required here seem to me to be somewhat weaker and more general than those required for decisions on fee level. Specifically, I argue for a structure of fees and subsidies, such that the net-of-subsidy fee charged would vary:

(a) positively with the marginal cost of the degree course involved;

(b) positive with the failure rate of the degree course pursued (after allowing for intake quality); and

(c) negatively with the matriculation score of the student (and thereafter subsequent university/college record).
Of course, all this is to complicate the fees issue and I recognise that complexity can be politically problematic. However, the main economic argument for fees must be that it will encourage a better allocation of resources within the higher education system - including the scarce intellectual resources of the nation. The structure I have suggested will, I believe, help to do this.

For the purposes of the argument here, it is essentially irrelevant whether the structure is imposed in the context of a loan scheme or not and whether or not any such loan scheme exploits the tax system as a collection agency - that is, whether we have a 'graduate tax'. What is important is that more promising students are encouraged to attend university rather than less promising ones, and that they are encouraged to choose courses with an eye to the differential costs those courses impose on the taxpayer. This may seem to involve second-order considerations as compared with the politically controversial issues of whether we should have fees at all and if so at what level. But these are not unimportant matters, and they may be ones on which we can at least secure some measure of concensus.
1. The obvious equity point should however be noted. This is that any fee subsidy involves a significant distribution from poorer to richer, and that to argue for zero fees on the grounds that some rather small minority of poorer persons would be otherwise disadvantaged is to fail to view policy in an appropriately systemic way. Equality, tertiary scholarships for the poor, although doubtless laudable as far as they go, are hardly an efficient anti-poverty measure. In this sense, the redistributive focus that often seems to surround the question of tertiary education seems to me to be essentially misplaced.

2. In the case of part-time students, the relevant cost is the value of leisure foregone over the period of study - something that could be expected to vary among individuals considerably and in a manner impossible to discern independently of their actual decisions.

3. Even in the US, which is often held up as an exemplar of an essentially market-based higher education system.

4. Even under fairly heroic conceptions of electoral processes, it seems unlikely that what will be revealed by voter behaviour is the marginal social benefit of public services, as the standard welfare economics model conceives that MSV. See Brennan and Buchanan (1984) for some reasons why.

5. This is the guess I offered in my fees abolition paper in 1971, and I stick to it. However, I am now much more skeptical than I was at that time that such guesses are worth much - unless of course they are common across a wide body of reflective opinion.

6. And although, one should add, it is right and proper that academics should think this way.

7. As large numbers of students take degrees, the extra income to be obtained by virtue of having a degree falls. Starting salaries of graduates have, for example, fallen by over ten percent over the last decade.

8. Whether such rents will prevail in the long-run depends on how the numbers of FFP students are regulated.

9. I am presuming that research support would be forthcoming also, calculated according to the best guess as to the marginal social benefits from academic research. However, this aspect of things carries us away from the fee question, and I set it aside here. That is, I shall take it that the final row of Table 1 is the relevant one for fee calculation.

10. This is not of course to be taken to be a defence of any or all cross-subsidisation. Universities and departments have for too long been allowed to proliferate courses without any effective economic constraint at all. The mere fact that some student wants a particular course - or more commonly some staff-member wants to teach it - has often been sufficient grounds for its provision. 'Academic' considerations have been take to have an infinite shadow-price; and no economic analysis can readily accept infinite prices.

11. My own information on this is restricted to performance in economics at the ANU - where there is a distinct correlation over the upper end of the range, but decidedly weaker one in the neighbourhood of the cut-off (currently around the 25th percentile).

12. That is, although success rates vary with matriculation performance over the whole range, in
the neighbourhood of the cut-off the relation between matriculation performance and success is virtually random.

13 By an ex ante subsidy I mean one provided to students on the basis of effective enrolment without regard to actual success; and ex post subsidy is one granted to successful students only after results are known.

14 The areas should specifically be sufficiently broad that no one institution's effect on pass rates for the areas is significant.

15 As a purely analytic matter, one must be careful to specify the operative constraints properly. It is all too easy to imagine that institutional constraints, or the effects of any specific policy can be overcome by some additional set of policies, when in fact to assume so is simply to assume away the constraint.