

THE ECONOMICS OF HIGHER EDUCATION WHO BENEFITS ?

Public funding of university education and the Government's proposals for a special tax on university graduates are now very much a matter of public debate. Judging the debate sensibly requires answers to several key questions:

- How much do university graduates earn?
 - Is studying for a university degree a sound economic investment for the student?
 - How much does it cost the taxpayer to fund a graduate?
 - What sort of a return do the taxpayers get? Are taxpayers indeed subsidising a 'free' higher education?
- The National Social Science Survey recently completed an analysis of the economics of higher education. The main findings are:
- A male student would invest about \$48,000 in income forgone in studying for his three-year university pass degree.
 - Given his higher earnings over someone who went straight to work after leaving school, the graduate would reap a return of 9 per cent on this investment before tax.
 - After tax, however, the return on his investment in a university degree drops to about 7 per cent - a reasonable rate, but not much better than if he had invested instead in property, the stock market, or buying a family home.
 - If graduates had to repay a fifth of their tuition costs through the graduate tax proposed by the Wran Committee, the return would dip to 6 per cent. And if in the future the graduate tax were raised to recover half the costs, the return would drop to a mere 5 per cent. This would make higher education a poor investment in strictly economic terms, presumably discouraging some students from going to university.

- Even without the graduate tax, a male graduate would pay about \$141,000 more in taxes over his full working life compared to a man who left school after Year 12 and went straight to work. So the government already benefits handsomely from university graduates.

- The government invests about \$35,000 in each student - around \$27,000 in teaching costs for a standard three-year pass degree, and \$8000 in taxes it would have collected if the

student had gone straight to work instead of university. The government's return on this investment, in the form of higher taxes, is about 5.5 per cent.

- Since the government can usually borrow at less than that, after taking inflation into account, it already makes a handsome profit on male graduates. For example, at its normal 3 per cent cost of borrowing, each has a present value of \$30,000 to the government.

- Women graduates are not profitable to the government. Over a lifetime they pay only half the taxes male graduates

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THE NSSS REPORT

Welcome to this first edition of the *National Social Science Survey Report*. The *Report*, to be published six times a year, will bring to its readers analyses from the National Social Science Survey, conducted by the Research School of Social Sciences at the Australian National University, together with results from the International Social Survey Programme.

We believe that the information in the *Report* will be of great value to decision-makers and leaders in politics, business, economics, labour relations and public policy. To date, the National Social Science Survey has been conducted four times. Rigorous statistical analyses of the data have yielded highly-respected results of importance to the academic social sciences, especially political science, sociology and economics.

It is our aim with the *Report* to share these results with a much wider audience. A list of some of the topics to be covered in future issues of the *Report* will be found on the back page with a subscription form.

Articles in this issue include:

- **Higher education** - the economics of higher education. How

much money does a graduate get for a university degree, and how much does the community get back in taxes? How will this be affected by the recommendations of the Wran Committee?

- **Women's work preferences** - women's views about paid employment, both full-time and part-time; how these preferences depend on the ages of their children; and the implications for public policy.

- **Party leaders and the 1987 election** - how public perceptions of the major party leaders were decisive in the last federal election, and the long-term implications both for Labor and the Coalition.

- **Privatisation** - Australian attitudes towards the privatisation of the airlines, the railways, Telecom and the postal services.

- **Compulsory retirement** - should people be compelled to retire at an age set by law? What Australians think, with comparable data from the International Social Survey Programme.

- **Obeying the law** - should the law be obeyed at all times, or are there exceptions when individual conscience must be the guide? Australian attitudes, together with comparable overseas ISSP data.



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do - because they generally earn less and often do not work for pay at all. The government makes a small loss on each female graduate of about \$4000.

Thus, rather than taxpayers subsidising students, the analysis indicates that taxpayers are in fact making a good profit from them - the big profit on men more than compensating for the small loss on women. Since there are roughly equal numbers of men and women students, each graduate is thus worth \$13,000 to the government.

WHAT IS A UNIVERSITY EDUCATION WORTH?

How much does a university graduate earn over and above a Year 12 student who goes straight to work after finishing school?

In answering this question we consider a male graduate with a standard three-year pass degree in arts, science or economics. Medicine and many other degrees take longer, but also pay more in the end. The economic returns to women are smaller because many earn less than men and most leave the workforce for a time to raise children.

In estimating the figures the analysis took into account family background, academic ability and labour-force experience. This is important, because university students are generally from more privileged families and have greater academic ability than people who do not go to university. Thus they would earn more even without a degree.

In effect, statistical methods were used to construct two hypothetical people with the same family background and ability. They differ only in that one starts work immediately after Year 12 in school, while the other goes to university for three years. In those three years, this is what they would earn in rounded figures:

	With Year 12 schooling	With university
age 18:	\$15,000	0
age 19:	\$16,000	0
age 20:	\$17,000	0

The Year 12 student would thus have earned about \$48,000 in those first three years. The university student earned nothing - so that for the first three years there is a big financial advantage in staying out of university!

After finishing his course at about age 21, the graduate would start earning

a higher salary than the Year 12 student - around \$19,500 a year as against \$17,500. This is a difference of some \$2000 which, given the \$48,000 investment the graduate has made in income forgone, represents a return of only 4 per cent. He could probably do better by investing in the bond market - and better still by investing in the admittedly more risky stock market.

The earning picture for the graduate improves, however, once he has obtained some experience (see Chart 1):

	With Year 12 schooling	With university
age 21	\$17,500	\$19,500
age 30	\$25,500	\$30,000
age 40	\$32,000	\$39,500
age 50	\$33,000	\$43,500

Eventually, therefore, university pays off well. By age 30 the graduate is getting 9 per cent on his investment, rising to 22 per cent at age 50. But the rewards are a long time coming.

Overall a male graduate who works full-time until age 65 gets about a 9 per cent return on his investment of three years and \$48,000 in a university degree - his 'internal rate of return'.

TAXATION

A graduate earns more but he does not get to keep it all: he has to pay higher taxes. By age 30, for example, the Year 12 student would be paying about \$5800 a year in income taxes, compared to \$7400 for the male graduate - a difference of \$1600 a year.

The gap widens as they get older and the income differential grows (see Chart 2). By age 40 the graduate would be paying \$3500 more in taxes than the Year 12 student, and fully \$5000 a year more by age 50.

Taking taxation into account, the graduate gets a net return of about 7 per cent a year on his investment (which

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Chart 1

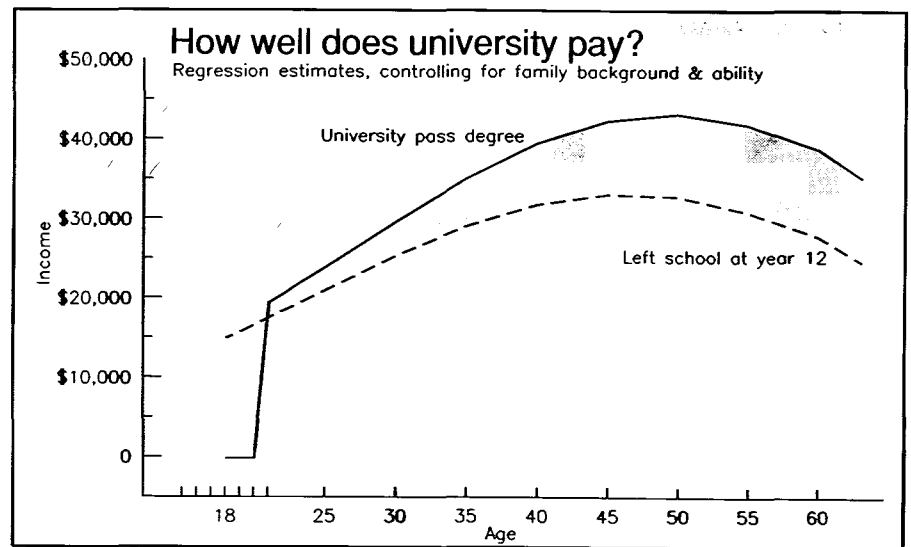
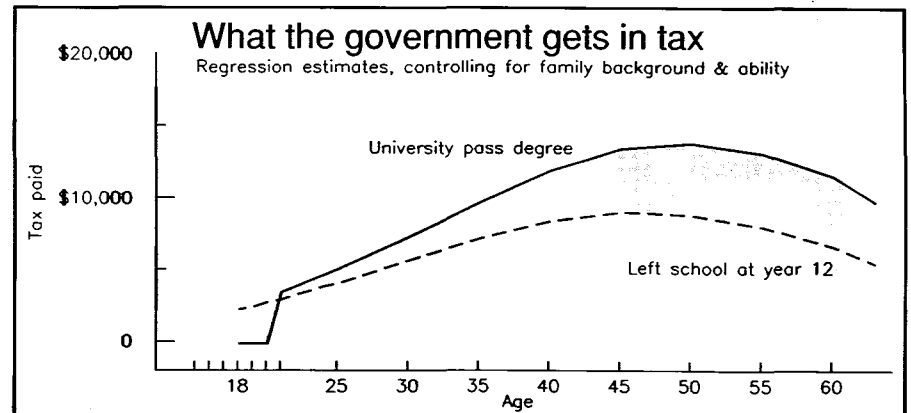


Chart 2



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comes to \$39,000 after tax). This is a reasonable rate of return - but not a great one. Investments in securities, the stock market or in property would pay as well.

Under the new tax proposed by the Wran Committee, a graduate would return 20 per cent of the cost through a tax surcharge once income rose above the average wage of around \$21,500.

Under this proposal, a graduate's return on his investment in higher education would drop to a modest 6 per cent. And if today's graduate tax is just the thin end of the wedge and eventually rises, the return would be even less. For example, if at some future stage graduates had to repay half the cost their net return would be only 5 per cent.

If the graduate had to pay full fees - as he would at a private university - the return would be even less - 4 per cent. Economically, that is a poor investment, at least for a student working in Australia and paying Australian taxes.

THE GOVERNMENT'S INVESTMENT

The other side of the economic equation is the cost to the government - and the ordinary taxpayer - of providing universities. Concern about these costs is a key reason why the 'user pays' principle is at the forefront of the current public debate.

It costs about \$9000 a year to educate a graduate - giving a round sum of \$27,000 for a standard three-year course. The cost is higher for science and medicine and less for arts and humanities, but this is a reasonable average figure.

In addition to paying for universities, there is a further cost to the government in taxes forgone during the three years the student is at university and not earning an income. A Year 12 student who went directly into the workforce would pay about \$8000 in taxes over the first three years.

Thus, in all, the government invests about \$35,000 in each university student - \$27,000 in teaching costs for a standard three-year pass degree and the \$8000 in taxes forgone.

WHAT IS A GRADUATE WORTH TO THE GOVERNMENT?

Is this investment worth it to the government and the ordinary taxpayer

who is paying for it all? What is the return on their investment?

The answer is that the government gets a good return on the money invested. Over a full working life of some 45 years, the male university graduate could expect to pay about \$141,000 more in income taxes than a student who left school at Year 12 and went straight into the workforce.

This amounts to a return to the government of about 5.5 per cent - its 'internal rate of return.'

It can usually borrow at less than that, after taking inflation into account - around 3 per cent a year, although it has been paying more recently. At its normal 3 per cent cost of borrowing, each male graduate has a present value of \$30,000 to the government.

Thus, rather than ordinary taxpayers subsidising students, they are in fact making \$30,000 on each male graduate. If not for the extra taxes paid by graduates, to keep its revenues intact the government would have to raise taxes on those without degrees - not lower them.

If a graduate tax is imposed, the government will make even more. Exactly how much depends on details of the tax. In the extreme, if students pay full costs - as they would at a private university - each male graduate would be worth \$57,000 to the tax collector.

Technical notes to this article will be found on page 11.

Jonathan Kelley

WHAT ABOUT WOMEN GRADUATES?

Most women graduates earn less than men and many do not earn at all, so the government gets less from them in taxes. As a result:

- the government makes only a small profit on the (few) women graduates who work full-time throughout their lives;
- it makes a small loss, about \$4000, on the average woman graduate who stays home for a time to raise children.

FULL-TIME CAREER WOMEN

Even career women mostly earn less than men, so the government gets less in taxes from them - much less, since taxes are highest on top incomes. Over a lifetime of continuous full-time work a woman graduate would pay some \$74,000 more in taxes than a woman with only Year 12 schooling. That is about half the extra taxes a male graduate would pay.

Are career women a good investment for the government? The actual value of the taxes is less because the government has to wait decades to collect the full amount. Adjusting for that, their present value is about \$31,000. From that the government has to set aside some \$27,000 to pay the cost of tuition, leaving it with a small profit of \$4000. So the government does make a profit on career women, although far less than the handsome \$30,000 it makes on male graduates.

THE AVERAGE WOMAN GRADUATE

However, few women work continuously throughout their lives. Almost all leave work at some stage to have children, and many never return to full-time paid work (see Mariah Evans' article elsewhere in this issue). Over a lifetime, women who leave school after Year 12 work only about 40 per cent as much as a full-time worker. Women graduates work more, but still only 52 per cent of full-time. Since they work less, they pay less in taxes.

As a result, the average woman graduate is not a profitable investment for the government. Over a lifetime it collects \$54,000 more in taxes from a typical graduate than from a non-graduate. The present value of those taxes is only \$23,000, since much is paid only decades later. That does not cover the cost of a university education. It leaves the government with a loss of about \$4000.

The graduate tax proposed by the Wran Committee would, as it happens, just about cover the government's loss. The ordinary taxpayer would then neither subsidise women graduates, nor make a profit from them.

In all, from the purely economic point of view, the government stands to gain \$30,000 from every male graduate but to lose \$4000 from every woman.



THE ECONOMICS OF HIGHER EDUCATION

DATA: The data are from the 1984-85 NSSS described elsewhere in this *Report*. The main analysis is confined to men aged 18 to 64, who are in the labour force earning at least \$1000 a year. Retirees, current students and a few long-term unemployed are thus excluded. The earnings analysis for women is similar. The effect of education on women's labour-force participation is estimated for women aged under 64. Income figures are inflated to mid-1988 levels using the consumer price index. The estimated cost to the government of university teaching, \$27,000, agrees with the Wran report (p 53). It differs from Wran by including Austudy but excluding research grants and excluding a further 5 per cent of recurrent spending as implicitly for research, so coming to the same result by a slightly different logic.

MEASUREMENT: *Earnings before tax* is from a detailed series of questions on wage and salary earnings and business income, summed and inflated to reflect current price levels. *Income tax paid* is estimated by applying the most recent federal income tax table to respondents' earnings. *After tax income* is earnings before tax less income tax paid.

Education is measured as the sum of years of primary and secondary school completed plus years of tertiary education.

Tertiary education is obtained from a question on highest educational qualification, coded into the 3-digit ABS education qualifications code, and recoded into the equivalent years of full-time training normally required for completion. To cater for possible non-linearities, education squared is also included in the analysis.

Family background is measured by two variables: father's occupation, in 14 status categories ranging from farm labourer to higher professional; and a categorical variable for farm versus non-farm origin.

Academic ability is a 13 item sentence completion scale which has been shown to work satisfactorily in sample surveys. It is derived from the Lorge-Thorndike Intelligence Test.

Labour-force experience is approximated by present age minus age left school; this approximation is satisfactory for men but poor for women. To cater for non-linearities, labour-force experience squared is also included in the analysis. Finally, a simple categorical distinction is made between *full-time* and *part-time workers*.

METHODS: We estimate the natural logarithm of earnings from an extension of the usual human capital earnings function using ordinary least squares regression:

$$\ln Y = a + b1*Ed + b2*EdSq + b3*FaOcc + b4*FaFarm + b5*Ability + b6*LFExp + b7*LfExpSq + b8*FullTime + c$$

where the variables are as described above. Estimates for after tax income and for income tax paid are from similar logarithmic equations.

Returns to education shown in Figures 1 and 2 are predicted values from these equations with family background set to the Australian mean (39 status points, 14 per cent farm); ability to one and a half standard deviations above the mean (corresponding to an intelligence score of 115); and assuming full-time labour-force participation beginning as soon as education is completed.

Returns are calculated once for 12 years of education (completion of Year 12 or 6th Form) and once for 15 years of education (completion of an ordinary three-year university pass degree). In effect, this procedure constructs two hypothetical men, with the same family background and ability, both completing Year 12 in school, and differing only in that one then goes to university.

The internal rate of return to investments in education is calculated in the usual way from the difference in these two earnings streams. Tuition costs (if any) are taken as paid at the beginning as, for simplicity, are the proposed graduate taxes (if any). The government's returns are calculated analogously, based on differences in taxes paid. Taxes are calculated for each individual respondent using their actual income and current tax tables. It would be wrong to calculate them, as is usually done, from estimated income since taxes are progressive and income is skewed to the right. The present value of the taxes to the government assumes a 3 per cent real interest rate (after inflation) on government borrowings.

Estimates for women who work throughout their careers are computed in the same way as for men, based on women's earnings equations. These are then adjusted for educational differences in labour-force participation, also estimated (by regression) as 40 per cent for women with Year 12 education and 52 per cent for women graduates.

**Senate of the Commonwealth of Australia:
Read into Hansard by Senator Macklin, 13 December, 1988.**

Senator MACKLIN»(8.39) —Once or twice a year the Senate is able to have a debate on what is the major social determinant of our future—that is, the education of young Australians. These Bills deal with higher education, technical and further education, school education and overseas students. Each Bill really warrants its own debate, as each has a very important role to play.

...

The Government's proposal is to institute a tax. The absurdity of the notion that the Government is running is apparent. It is running the line: 'No change has taken place and therefore we are going to put on a fee and somehow or other make it better'. That absurd proposition does not fool anybody. We know what the Government is on about—it is on about raising money. The facts of the matter are the graduates subsidise the community in this country; they are not subsidised by the community. On the occasions that I have managed to debate this matter with the education Minister, I have referred to the National Social Science Survey Report by Dr Jonathan Kelley. I have shown this report to the Government. I seek leave to incorporate the report in **«Hansard»**, because I think that is the best way for people to read that short summary of the economics of higher education benefits.

Leave granted.

The document read as follows-

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