

An Economic Analysis of Student Financial Aid Schemes

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Introduction [1]

It is almost universally acknowledged that investments in knowledge and skills play an important part in maintaining national standards of living. Yet governments are concerned about the state of their budgets. Hence, while investments in education are necessary, governments are limited in their possibilities to make these investments themselves. It is therefore argued that students must contribute more to the costs of their education. A notable illustration of this is the recent proposal by the new British Government to start raising tuition fees, thereby ending the long-standing tradition of free higher education. Gradual increases in tuition fees can also be observed in other countries. In addition to increasing the amount of funds available for education, raising tuition fees also reflects the notion that the individual participants benefit from their schooling and that private payments strengthen student–institute relations, thereby enhancing consumer sovereignty.

Higher tuition fees may put at risk the accessibility of higher education. What happens to accessibility if tuition fees are increased critically depends on how the system of financial aid operates. In the economics literature, there is now a growing consensus that income-contingent loan schemes are the most efficient and most equitable form of financial support for students.

This article reviews the arguments and empirical evidence in favour of this scheme and compares it with two alternatives: a mixture of loans and grants and a graduate tax. It also discusses reasons for government involvement in financial aid systems; the ‘classical’ system of a mixture of mortgage type loans and income dependent grants; the graduate tax system; the income-contingent loan scheme and the arguments and evidence concerning this scheme; and a recent policy document on the future of student financial aid in the Netherlands.

Reasons for Government Intervention

Two sets of reasons for government involvement in financial aid schemes for students can be distinguished: capital market failure and equity considerations [2].

Capital market failure refers to the fact that many students may find it extremely difficult to obtain loans from private banks to finance their investment in education. Either they are refused a loan or the borrowing terms are unfavourable despite the fact that, for most students, an investment in education has a high return. We can give three reasons why such a private capital market does not emerge. First, the

repayment of a loan depends, amongst other things, on the students' efforts to earn a high income. The lender cannot see these efforts and runs the risk that the borrower may choose a low level of effort. Since there is no collateral, the lender cannot secure repayment. Second, a private bank will have to add a risk premium for cases of default to the interest rate, otherwise it will end up losing money. Some (lowest risk) students may find the interest rate and risk premium too high and withdraw. The remaining group will therefore have a higher risk of default which may imply that the then lowest risk students may also withdraw. This process of adverse selection may continue until only the highest risk students remain. Finally, students will have doubts about their abilities to complete their studies and find a good job. If they are risk averse, they will attach more weight to the negative outcomes than to the positive ones. Hence, even if the interest rate represents the true risk, people will underinvest.

The main reasons for government involvement are probably equity considerations. When evaluating the equity aspects of a financial aid scheme, it is useful to distinguish between the position at the time of enrolment and the lifetime position. At the time of enrolment, equity relates to the opportunities given to students from low income backgrounds. From a lifetime perspective, one would not wish to subsidise those who belong to the richer section of their cohort.

Mortgage Loans with Income-dependent Grants

A mortgage loans model supplemented by social background-dependent grants seems at first sight to perfectly match the motive of capital market failure and equity. The loans part compensates the capital market failure and the grants part compensates students from poorer social backgrounds. The match, however, is less smooth than it appears.

In this scheme, the loan must only be reimbursed within a given period if the borrower's income exceeds a certain threshold. There is often also a rule that fixes the number of years within which the loan must be repaid. Ten to 15 years is usual. If the sum is not repaid within that period, it is remissioned. This is at odds with the idea that schooling is an investment in future (labour market) opportunities. If one compares age-earnings profiles by level of schooling it is clear that the returns on schooling materialise later in one's career. Repayment of the loan could best take place when the returns are gathered. Synchronisation of repayment and collection of the returns is a desirable feature of a student loans system. In that sense, a short repayment period is not suitable.

In this system, students from low income families receive a compensating grant. This grant stimulates the enrolment of the target group if students in this group see debt as a greater barrier to study than students from other families. However, in our earlier terminology, this system only deals with equity at the time of enrolment. It does not consider the fact that, over a lifetime, students from low income families belong to the wealthy part of their cohort. And it also treats students from low and high income families differently whereas, from a lifetime point of view, there is no difference between the two groups. Another problem is the evaluation of family income. Preferably, this evaluation should reflect the family's ability to pay on a lifetime basis. This means that, ideally, the family's lifetime income (both from work and capital) should be taken into account. In practice, however, testing the family's means to contribute is based on its income

during the years the student attends higher education. In the US, for example, the family's assets are also taken into consideration. The question then arises whether a family's labour supply and savings decisions will be affected by the implicit taxation on the income-dependent grant scheme. Edlin (1993) and Feldstein (1995) argue that, depending on the income bracket, the implicit marginal tax rate is quite high and that the adverse effects on savings decisions could be very substantial. Families may decide not to save (and some may start borrowing instead) because having financial assets and receiving capital income from these assets reduce the level of the grants their children receive when they enrol in higher education.

Graduate Tax

It is often argued that students from low income families experience debt as a (psychological) barrier which may refrain them from attending postsecondary education. It has therefore been proposed to introduce a graduate tax instead of a loans system [3]. Instead of providing students with a loan that has to be repaid, students receive a grant which they 'repay' through a special tax. An additional advantage of this system is that students from high income families also have a (tax) debt. Under a loans scheme system, it could be that students from high income families do not take out a loan because they are funded by their parents. The introduction of a graduate tax is believed to offer equal opportunities to students from low and high income families at the start. Although this scheme seems to have a good 'equity' record, it has four drawbacks.

First, educational policy and income policy are mixed up. Although a loans system is very efficient because it provides financial resources to students who cannot raise funds themselves, it seems to create a difference between students from high income families and those from low income families. But if both groups did not study, they would occupy different positions. This could be considered undesirable, but it has nothing to do with educational policy and is merely a matter of income policy. In fact, a graduate tax creates solidarity between students from high income families and those from low income families. It does not deal, however, with solidarity between non-students from high income families and studying or non-studying children from low income families and between those from high income families and non-studying children from low income families. Hence, in a graduate tax system, it depends on educational choices and not on initial positions *per se* whether people are obliged to give up part of their income and whether people belong to a group for which others must give up part of their income.

The second drawback is that total earnings serve as the tax base. The principle behind a graduate tax is that those who gain most from it also pay most for it. This implies that the graduate tax should not be levied as a percentage of total earnings but as a percentage of the additional earnings due to schooling. By taxing total earnings, all other factors that contribute to earnings are also taxed. This implies that ability or talent is taxed. And although the taxation of ability may be desirable in the form of a graduate tax, it may also be harmful. The problem is that people with great abilities who do not follow postsecondary education do not have to pay this special tax. Hence, these people may decide not to attend higher education in order to avoid the implicit ability tax.

Third, with most loan schemes, people whose earnings in a given year fall

below a certain threshold do not have to repay that loan that year. Hence, there is a disincentive to supply labour; those who are in debt can choose a job that pays them less than the threshold. A comparable effect is seen with the graduate tax. Graduates know that a certain percentage is taxed for each extra amount they receive; the graduate tax increases the marginal tax rate. This may affect job choices. Hence, both a loans system and a graduate tax system generate disincentives in labour market behaviour. With a mortgage type loans scheme the disincentive occurs only at the threshold value of earnings, whereas with the graduate tax, job choices at all levels are affected. In the words of the economists, with the mortgage type loans scheme there is only an income effect, while with the graduate tax there is also a substitution effect. One of the elementary propositions of public economics is that the substitutions effects should be avoided as far as possible, since they incur welfare losses.

A final drawback of the graduate tax system compared to loan schemes concerns avoidance of repayment. People who emigrate are obliged to repay their debt, whereas they are not obliged to pay a graduate tax in a country where they do not live. As international labour mobility increases (as may be expected in an integrated Europe), this drawback becomes greater.

Income-contingent Loans

A third model of student financial aid has recently been proposed and analysed by a number of economists (Barr, 1993; Barr & Falkingham, 1993; Chapman & Harding, 1993; Oosterbeek, 1995; Kane, 1997). In this model, the only form of financial support is loans for which repayment depends on income, i.e. income-contingent loans (ICLs). During their studies, students can obtain a loan which they repay as a percentage of their earnings. It is also possible to grant a dispensation to those whose earnings lie below a certain threshold. Repayment is more evenly spread over a person's professional career than with the mortgage type loans schemes, i.e. the costs of the investment in education will be repaid when the returns materialise. The important difference with the graduate tax system is that a person never repays more than the sum of the loan and interest. Therefore, the disadvantages of the graduate tax system mentioned above do not apply to income-contingent loans. There is no confusion with income policy and there is no disincentive to enrol in education. The only disincentive concerns labour supply, but the effect is similar to that which occurs with the mortgage type loans scheme. Finally, the income-contingent loans system is not part of the tax system and therefore avoidance through emigration is not possible.

A separate issue concerns the interest rate that students should pay. From the point of view of the lender, it is desirable that the interest rate include a premium for defaulters. This is feasible if the probability of a person's default is as uncertain for the borrower as it is for the lender, i.e. not very likely. Borrowers know more about themselves, and therefore about their own risk, than lenders. Hence, bad risks will drive good risks out of the market. The relevance of this mechanism increases with the heterogeneity of the student population. Since enrolment in postsecondary education in most countries has increased over the last decades, the student population may be quite diverse. Hence, the Government must be very careful when fixing the default premium included in the interest rate. Adverse selection may be a serious problem. To avoid this problem, Kane (1997, p. 347)

proposes that the costs of the default premium be paid by taxpayers rather than by other borrowers. Low risk borrowers would then have no incentive to withdraw from the pool. If the interest rate is below the discount rate expressing students' time preference (implying a subsidy), those who have longer repayment periods benefit more from the interest rate subsidy than those who repay more quickly. According to Chapman (1997, p. 745), this is consistent with a framework in which those who gain the most from their investment in education also pay more.

If the lender (the Government) is unable to shift the risk of default to the borrowers, it is reasonable that the lender screens the students who are eligible for a loan. Academic records can be a good indicator of the students' default probability.

Simulation models have been used both for the UK and Australia to predict the effects of income-contingent loans in terms of the amount repaid and the average repayment period. On the basis of a zero income growth and a zero real interest rate (i.e. interest equal to the rate of inflation), the amount repaid is the same as in a mortgage type loans system in which repayment is due within ten years. For Australia, Harding (1995) calculates repayment percentages of 96% for men and 77% for women. According to Chapman (1997, p. 743), these are conservative estimates, since they are based on the 1993 repayment rates which are below those in 1996. The average repayment period in the income-contingent loans system is between 25 and 30 years. If the growth rate of earnings exceeds the real rate of interest, the income-contingent loans system is advantageous.

In summary, from the point of view of capital market imperfections, the income-contingent loans (ICL) system is to be preferred to the mortgage type loans system and the graduate tax. The final judgement then depends on how well each of the systems serves equity goals. With respect to equity in a lifetime perspective, the performance of the ICL model is good. There is no redistribution towards those who occupy the better positions in their cohort measured over a lifetime. Neither does the ICL model make distinctions between students from high and low income families. Remains the issue of equity in the sense of accessibility. The crucial question is whether students from low income families experience it as a barrier if they have a debt they know they do not have to (fully) repay if they cannot do so.

Two pieces of empirical evidence suggest that such adverse effects will not occur. First, Oosterbeek and Webbink (1995) use results from an analysis based on Dutch cross-section data to simulate a transition from a grants system to a loans system. The original analysis estimates the probability of a secondary education graduate going on to higher education. The vector of regressors includes parents' income, the students' expected earnings and the students' perceived level of earnings foregone (questions on these financial variables were included in the questionnaire [4]). Switching from a grants system to a mortgage type loans system is equivalent to reducing future earnings by a specific amount that represents the repayment of the loan. Performing the simulation for the amounts of 200 and 400 Dutch guilders a month does not affect enrolment levels. The only exception is students from families with the lowest income levels where a significant but small drop in the enrolment level is reported. This is because those students have lower expected future earnings. Subtracting a fixed amount (200 or 400 guilders) therefore has a greater effect for them percentagewise. If, instead, the simulation were repeated with the repayment being a fixed percentage, the adverse effect of lower enrolment for students from low income families would disappear. This

effect would be even less strongly felt if the repayment percentage were made a more important function of the income level.

The second piece of evidence comes from Australia and is based on real experience rather than on simulation [5]. In 1989, the Australian Government introduced tuition fees in universities. They covered some 23% of the public sector's direct expenditure for average full-time students. Students can choose between two methods of payment. They either can pay the tuition fees directly, in which case they obtain a 25% discount, or they can defer payment until they work and earn at least the current average taxable income of working Australians. In that case, they are charged an interest rate which is equal to the inflation rate (which makes the real rate equal to zero). The amount repaid in a given year equals a certain percentage of taxable income in that year. It equals 3% for taxable incomes between \$27,675 and \$31,449, 4% for the \$31,450–\$44,029 income bracket and 5% when taxable income exceeds this threshold. Chapman (1997) gives a detailed analysis of the experience with this scheme. Two findings stand out. First, a vast majority of students opted for the repayment plan. Second, Chapman (pp. 747–49) finds no evidence that access to higher education for disadvantaged groups diminished. In a questionnaire which listed 17 reasons why final year high school students did not enrol in higher education, tuition fees ranked 13th and this was not related to the students' socio-economic status. Furthermore, a comparison of enrolment rates of students from three different socio-economic groups (high, medium and low) before and after the implementation of the scheme shows that, for each of these groups, enrolment had risen by about the same percentage [6].

The Current Policy Debate in the Netherlands

At present (1997), a debate is going on in the Netherlands about the future of student financial aid schemes. A commission has been set up and should report to the Dutch Minister of Education. The Dutch financial aid system is run by the Government and includes three components: a basic grant which is equal for all students but is differentiated according to whether students live with their parents or not; a grant whose amount depends on parents' income; and a mortgage type loan. When the system was implemented in 1986 it was quite generous. Later, however, with growing influx and a shrinking public budget, the amount students received was reduced several times and the terms determining whether they received a grant rather than a loan were modified. Each modification only applied to new students, resulting in a situation where essentially similar cases were confronted with a different system. The commission's main task is to elaborate a sustainable system of student financial aid.

In the summer of 1997, the commission published a report in which it suggests building blocks as a future system of financial aid (College Toekomst Studiefinanciering, 1997). Reading this document made me quite pessimistic about the durability of the system this commission will eventually propose. I shall now briefly list the commission's main building blocks and comment upon them.

According to the commission, the financial aid scheme should not influence students' choices of subjects. Reasons given for this are that subject choice is supposed to be quite insensitive to price differentials and that students who choose a subject on the basis of price rather than contents may not be highly motivated. In principle, this is a valid point, since variations in the financial aid scheme are

not the best instrument for affecting student choices. But if student fees are not differentiated by subject area (as is the case in the Netherlands and in many other countries), it may be worthwhile considering this differentiated financial aid instead. In any case, the reasons raised by the commission do not seem valid. First, a study by Berger (1988) indicates that the choice of subject is affected by future returns (hence, financial incentives matter). Second, it does not seem unreasonable to assume that many lawyers and medical professionals are motivated by the financial prospects of their occupation. We seldom hear that their salaries should be reduced in order to select more people who are highly motivated.

The commission argues that the financial aid scheme should guarantee access but should not be used as an instrument for income policy. These are valid points which follow from an economic analysis of financial aid. Next, it argues that the new financial aid system could be used to strengthen relations between students and the institution. A decentralisation of financial aid is therefore advocated. Yet other instruments are far more appropriate to strengthen these relations, the prime candidate being an increase in tuition fees. Furthermore, the main rationale for setting up a financial aids scheme is related to capital market failure and equity considerations. Both pooling of risks and dealing with equity can best be handled at the highest level of aggregation. Moreover, in the US, financial packages consist in support from the Federal Government, from States and from institutes. The result is a 'system' which is neither simple nor transparent. As Kane (1997, p. 346) states: 'families (in the US) are unlikely to know just how much aid is available until they apply, are accepted, and receive a financial aid offer from the college.'

As a fourth building block, the commission states that the system should be simple and transparent. This is, of course, a sound objective, but is at odds with the proposal to decentralise financial aid to institutions.

The commission argues that government involvement in a financial aid system is motivated by social returns on schooling. But since it is also aware of the private returns on schooling it chooses a mixture of grants and loans. Grants because of the social returns and loans because of the private returns. Positive external effects on schooling provide an argument for subsidies. In the Netherlands (as in many other countries), large subsidies are already given as direct support to institutions with lower tuition fees. It is hard to believe that external effects are so great that even at tuition levels equal to zero not all external effects are considered. The problem with these effects is that they are hard to quantify and, so far, no convincing estimate of their importance has been produced. Amongst economists, however, the common opinion is that external effects are probably not very high. It is also believed that they decrease with the level of schooling; they are higher at the elementary school level than at university level. If that is the case, there is no reason to give grants to university students if the direct subsidies to universities by far exceed the direct subsidies to elementary schools.

The commission thinks that students' perceptions of risk will depend on the method of repayment. It is therefore in favour of a graduate tax to repay the loans part of the financial aid package. It is believed that it reduces students' aversion to borrowing. Given our comparison of the graduate tax scheme and the system of ICL, it is surprising that the first is mentioned as a possible solution here.

The commission explains the financial dependence of students on their parents by the scarcity of public resources and the 'political valuation' of parents' duty to take care of their children. Therefore, testing parents' financial means is necessary.

The commission seems to be totally unaware of the adverse effects of such testing on parents' labour market and savings decisions. Moreover, with many parents being divorced, the administrative burden of these tests may be substantial.

Given the strong arguments in favour of an ICL system, it is puzzling why a serious commission set up to advise the Government on a future system of student financial aid should propose building blocks which are so at odds with an ICL system. The explanation is probably related to the diverging prior opinions of the commission's members. One is a former chairman of the left-wing student union who was a strong advocate of a graduate tax scheme. The commission's chairman, on the other hand, is a former member of the Dutch Parliament representing a right-wing party. The building blocks proposed by the commission seem a fragile compromise of commission members representing very opposing views. The term building block is therefore a bit misleading. But, of course, there are blocks that are used to build a pyramid and building blocks for less stable constructions.

Conclusion

This article evaluated three financial aid schemes. A mixture of mortgage loans and income-dependent grants has three main disadvantages. The repayment period is too short, the grants have regressive lifetime distributional effects and the income dependency of grants may affect parents' labour market and savings decisions. A graduate tax scheme mixes up income policy and educational policy and may have adverse effects on educational and occupational choices. A system of income-contingent loans does not have any of these disadvantages and should be preferred on grounds of efficiency and equity. Although this is no news to economists studying educational finance, and it is hoped that the arguments in this article persuaded readers from other backgrounds, it seems that policy advisers (at least in the Netherlands) have difficulties in appreciating the model's elegance.

NOTES

- [1] Parts of this article draw on Oosterbeek (1988; 1995).
- [2] In principle, the motive of 'external effects' could be added to this list. As long as tuition fees are positive, however, the value of these external effects is apparently covered by the Government's direct subsidies to institutions.
- [3] In the Netherlands, this system has been strongly advocated by representatives of the student unions.
- [4] One could argue that such expectations and perceptions need to be equal to the realised values. But, first, it is expectations and perceptions that students use in the end as inputs in their decision-making. And, second, there is now increasing evidence that students' expectations are not too far off the mark.
- [5] This information is taken from Chapman (1997).
- [6] An additional statistic which is of interest is that the administrative costs of the Australian scheme are just over 1% of current annual revenue.

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