

Assessing the case for government funding or provision of secondary and higher education

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(I) Introduction

The arguments that usually surround the public provision of goods concern the fact that it is necessary for the government to provide and fund them owing to the fact that, if left to the private sector, they would not be provided at all. Two of the main textbook examples of pure public goods are national defence and street lighting where, in basic terms, it is argued that no one can be charged directly for the defence they consume, since it is implausible to measure, for example, the ‘amount’ a given agent has consumed. Most readers will be well used to the existence of education as a public good, funded directly by the government. However, even the briefest inspection of education shows that it does not strictly possess the characteristics of a public good. For example, whilst it may have that characteristic of ‘non-rivalry’, in that one student listening to a lecturer does not prevent his neighbour from consuming the same amount of ‘contact time’, it does not have the facet of ‘non-excludability’; it is very easy to exclude someone who has not paid a fee from a classroom, just shut the door! All of which begs the question, why does the government provide education?

The aim of this brief exposition is to answer this question, first in a qualitative manner and second using a more formal, microeconomic model set out by Hare in “Surveys in Public Economics”. It is this formal representation that will allow us to make the first distinction between secondary and higher education, with some recent developments in the funding of higher education lending support to Hare’s findings.

(II) *Qualitative rationale for public funding of education*

In this section we shall look at education as a single good, without differentiating between its secondary and tertiary forms. We saw in the introduction that it is not really possible to justify public funding of education in the way we might with more pure public goods. There are four strong ways that we justify this government spending; (i) market failure, (ii) merit goods, (iii) externalities, (iv) distributional. I will examine them each in turn.

(i) Adam Smith was one of the first people to think about the decision of undertaking education as being almost the same as an investment in a machine, and now we might also consider it comparable to some form of financial investment. The idea is that before an investment decision is made the investor takes into account the costs and revenues involved in, say, a project, and the solution being that they will be indifferent between undertaking the project or not where the costs and revenues are exactly equal. We, like Smith, can look at education in the same way but there is a problem, in that the costs and revenues discussed above are quite measurable, can be contracted, or easily forecasted. Further, if it was necessary to borrow to undertake the project there may be some form of real asset that could be seized if the revenue stream failed. None of this is very possible with an investment in education. For example, economists have attempted to measure the returns to education and come up with figures from 3 to over 10 percent, also we notice that human capital is not ‘collateralisable’, in that if the borrower defaulted on their loan, the lender would not be able to remove the asset. So we see capital market failure in education, which means that it is necessary for the government to intervene.

(ii) There are some goods, such as education, which the government, as society’s representative, decides are beneficial for its subjects to consume. However, left up to themselves, the government predicts, the subjects will not consume enough of those commodities to maximise society’s welfare. That is, the aggregated preferences of the subjects are not the same as the preferences of society. Consequently, it is necessary for the state to fund the provision of a minimum amount of, say, education, which it has

predetermined as the optimal amount, for if it were left to the private market individuals would under-consume it.

(iii) The third of the rationale to be explained is externalities, it should be made clear that the externalities derived from education are assumed to be positive. The individual may take into account that there should be extra revenue from undertaking some education (though we have established that it is very difficult to quantify accurately), but there are other feedback effects that they will almost certainly not account for all of the feedback effects. There are direct economic feedback effects¹, for example the educated worker will be more productive than the uneducated. The productivity gains, feed through the firm level, and eventually will have had an impact on the macroeconomy, positively impacting economic growth. A more indirect feedthrough of education could be that those who have received it are more tolerant, and open to change, this could lead to a more Utopian society, which should increase social welfare. Because individuals do not take these into account they will under-invest in education, therefore the government intervenes to ensure that it is part of the decision set.

(iv) The final qualitative rationale that is provided to justify government spending on education is its distributional effects. The idea here is that society benefits if there is some universal level of utility and the most effective way of achieving this is to redistribute income via taxes and subsidies. However, there is another way of doing it, by funding the provision of commodities that are welfare improvers. For example, in the case of poverty, some argue that, depending on marginal tax rates, there is a ‘poverty trap’ encouraged by government subsidies. However, because of the returns that exist in education, there is a way out of the ‘poverty trap’. So there is an argument for public financing of education on the grounds of its potential for poverty alleviation.

¹ If we assume that education is productivity increasing vehicle and not merely an ability signalling mechanism

(III) The economic justification for state funded education

Atkinson and Stiglitz set out a model for the optimum allocation of publicly provided private goods. This was enhanced by the work of Arrow (1971) and then of Hare and Ulph (1980) who applied the model specifically to the context of the optimal allocation of education provided by the public sector. They show the government’s welfare maximisation problem in following way:

The first part of the problem shows the individual utilities as they are distributed across the ranges of abilities, which have to be maximised subject to the constraint in the second half of the problem. The solution yields a first-best optimum, which has four characteristics. There should be uniform consumption of education; second, it and labour supply should increase with ability; third, the lump-sum transfers declines with ability and becomes a lump-sum tax at high levels of ability; fourthly, utility is declining in individual ability.

It is extremely important that this model depends on ability and that the results are heavily dependent on ability. It is very easy to show that this model is unachievable. The whole thing relies on our ability to formally conceptualise and figure out a way to reliably measure ability. So the first problem we have in achieving this first-best situation is definitional. What is ability? Students vary in ability in a plethora of ways; while some may be good at mathematics others will be good at drama, so it is extremely unlikely that a test can be formulated to capture both children’s skill. Further, when would the ability be measured? For this really assumes that ability is independent of education, and that it is not possible for education to change ability. What we are saying then is that it simply is impractical to measure ability.

A second facet of the ability argument centres on the fourth characteristic of the solution. Those who are more able will receive lower utility from their education. This means that this model is unattainable in the same way that most separating equilibria are unsustainable given informational asymmetries. Where ability is immeasurable, there is

every incentive for the high ability student to pretend that he is low ability, since everyone consumes education uniformly, and the only difference is whether they are taxed or subsidised. That high ability student will then gain more utility from his education.

The inoperability of the first-best optimum set out by Hare, adds further weight to the qualitative justifications for public financing of education announced in the previous section. The first-best state of the world arises where the government is able to separate the students. However, this is not really possible for ability. Further, it is not really possible to separate these individuals on any other basis. Some may talk of means testing them, though in an economic sense this is unreasonable, since most children have nothing, and it would surely be unfair to means test their parents, given the functional form exhibited above (we maximise one generation's utility). In the absence of an agency having the ability to separate these children, the government must surely have to fund the provision of education.

Recent events in the changing way that higher education is funded at the individual level, seem to support to some extent the findings of this model. In England and Wales today university students have to pay a fixed amount toward their tuition fees. How does this support the model? The developments suggest that the government now considers that it has found a measure of ability, in that everybody who has achieved a place at university is of a minimum ability or above, therefore they have signalled their level, and it is possible to reduce their lump-sum transfer. The payment of tuition fees looks like a tax, however university education is still heavily subsidised, so the students' contribution represents a reduction in transfer.

The above shows in a more rigorous way that the government is forced fund the provision of education because the first-best optimum allocation set out by Hare is not possible to achieve. At least this is the case for the situation where it is unreasonable to think that we can separate students, however where we can (I suggest, from “A”-level results) then the government no longer has to fully fund the provision of education.

Indeed this is what we see in England and Wales today. Notice, though that the lack of any exemption from the tuition fees means that the model only works in the extreme, students are either able (in which case they pay the fees) or they are not (in which case they do not go to university).

Surely though, this is in direct conflict with many of those qualitative arguments presented in section (II). The withdrawal of funding from education will cause under-investment, regardless of ability. Further, it will negatively impact income distribution; we know that graduates earn more than non-graduates. If they have to pay for their higher education, then only the rich will attend university and thus in words of Mead there will be a self-reinforcing downward spiral in which we perpetuate the “good fortune of the fortunate and the bad fortune of the unfortunate.” How, then is it possible to further support the preliminary findings of the above model? One suggestion is via the graduate tax.

(IV) The graduate tax debate

The graduate tax debate is an interesting one in which the old arguments about, for example, payment for higher education and equity, are turned on their heads. The graduate tax was first implemented in Australia, in 1989/90, under the name of Higher Education Contribution Scheme (HECS). The way it worked was to charge a uniform fee to all students who had the choice of either paying the sum up-front, or they could defer payment until they were working. Even then, the charges would not be made until the former student was earning an appropriate amount- determined *ex ante*. An amount would be removed from the pay package of each borrower along with their tax payments. Note that the actual charge of the fees only accounted for around 20-25 percent of the total cost of teaching. This subsidy of around 75 percent may reflect, in part, the externality of higher education and thus may also mitigate part of that argument in section (II).

Let us suppose that I have proved above that it not optimal for the government to fully fund higher education, why bother with the graduate tax? In the second section we discussed some capital market imperfections, such as ‘mortgage-like’ loans being difficult to secure for educational purposes because human capital is not ‘collateralisable’ (in the absence of slavery). Thus a fee would present a financial barrier to entry for the poor. However, the graduate tax skirts this problem by making payment for your education state contingent (you only pay if your investment yields some significant financial returns).

It is also possible to argue for the graduate tax on pure equity grounds: Previously, when higher education was free, most of the people that attended were the more charmed end of the income distribution spectrum. However, because it was funded by taxation revenues, the majority of the people paying for the education were not the ones whose families were likely to benefit from it, this perpetuated the distributional gap. Indeed, Chapman (1997) supports this claim by showing that in the 1980’s in Australia children with parents in professional and managerial occupations were four times more likely to go to university than others, implying that 85 percent of funders’ children were unlikely to get that chance.

These tuition fees are essentially loans, the interest payment on them is simply an index link, so that the real rate of interest to be charged is zero. It has been shown that those who are in higher paying jobs pay their ‘loans’ back much quicker, this coupled with the zero real interest rate means that in net present value terms, the faster the loan is paid, the more expensive it is. Thus, thinking about equity again, those who gain more economically from their higher education (in terms of monetary returns), effectively pay more for. This could be viewed as intuitively equivalent to the ‘more ability, pay more’ findings of the model in section (III)².

² I am not suggesting that “success” and “ability” are the same thing, though an intuitive could be made to see that Hare was saying that those who will get most, economically, from education should pay more for it

The evidence available suggests that the take up of places was not negatively affected by the introduction of HECS. Chapman points to Australian Council of Educational Research data that examines the proportion of eighteen-year-olds enrolled in higher education in 1988 and 1993 (the first date being prior to the introduction of HECS, the second after). It separates the group into those from high, middle and low-income households. The results show that all of the groups saw an increase the proportion going to higher education, with the proportions in the high and low income groups both increasing by approximately one third.³ Thus there is serious evidence in favour of the argument for the public sector reducing it's role in the funding of higher education.

(V) *Concluding Remarks*

This paper began by examining education as sort of publicly provided private good. We showed some qualitative arguments that indicated that education can only really be provided in the manner of a public good because of a number of market failures, externalities that individuals do not internalise in the decision making process, the existence of merit wants, and distributional issues. In section (III) I took a model which seemed to support the argument that education can only be funded by the public sector. However, it actually signalled the distinction between secondary and higher education, because it suggested that the first-best allocation of education should essentially be determined by different levels of funding given on the basis of ability. This was shown to be impractical for children up to eighteen years of age, however, the further pursuit of education beyond eighteen is the signal of ability required by the model.

All of the findings at the end of section (III) could still be refuted by those qualitative arguments posited in the second. However, using the experience of, and evidence from Australia it was possible to show that in fact market failure, externalities and merit wants are dealt with by the form of the student self-funding mechanisms in place. Meanwhile,

³ However, I do not think that this evidence controls for anything. For example, the macro economic environment. It might be that there was a recession in 1993 in Australia, and the trend in university enrolments could well be anti-cyclical- it is possible that this effect could outweigh any negative impact that the HECS could have on enrolment figures.

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one of the largest objections to tuition fees, that of distributional effects (that is, both income and those who take up higher education), was proved wrong by experience, and by logic. It was in fact, by a twist of logic, the free provision of higher education that was distributionally regressive.

References

Atkinson & Stiglitz “Lectures on Public economics” *McGraw Hill* (1980)

Hare (ed.) “Surveys in Public Economics” *Blackwell* (1988)