An Economic Analysis of the Formal Regulation of Higher Education

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Abstract

In recent years there has been a great deal of concern expressed by policy makers that not only should access to higher education be expanded but also that academic outcomes for students should be protected by formal government regulatory arrangements. As part of this process one international trend in the provision of higher education has been the growing tendency for governments to promote greater levels of institutional autonomy and exposure to market forces, while at the same time demanding greater formal accountability to government regulators. This has usually involved the creation of formal regimes that aim to regulate levels of internal efficiency, implement quality assurance mechanisms and encourage greater financial accountability on the part of higher education institutions where they are financed from the public purse. In this paper the economic rationale for the regulation of markets more generally in terms of market failure is identified and an attempt is made to match this intervention with the various types of regulation imposed in higher education markets.

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Introduction

In recent years there has been a great deal of concern expressed by policy makers in a number of countries that not only should access to higher education be expanded but also that academic outcomes for students (both domestic and international) should be protected by formal government regulatory arrangements. As part of this process, one international trend in the provision of higher education has been the growing tendency for governments to promote greater levels of autonomy for higher education institutions and exposure to market forces, while at the same time demanding greater formal accountability to government regulators. This has usually involved the creation of formal regimes that aim to regulate levels of internal efficiency, implement quality assurance mechanisms and encourage greater financial accountability on the part of higher education institutions where they are financed by taxpayers.

The literature on the rationale behind economic regulation as a means of alleviating market failures is an extensive one although it has seldom been applied to the regulation of higher education markets. It has long been argued that there are quasi-public good reasons in favour of subsidising higher education and related academic research, however, there has been so far a great deal less attention given to justifying the direct regulation of private and public higher education institutions on economic grounds. Nonetheless, in recent years there has been a proliferation of regulatory regimes around the world designed to affect the behaviour of higher education institutions.

The purpose of the paper is to reflect on the nature of higher education market regulation by identifying the economic rationale for the regulation of markets, more generally in terms of market failure and attempt to match this intervention with the various types of regulation imposed. Given the lack of work that has been conducted in the area, it seems unlikely that the regulation of higher education markets is quite what would be expected of analysts and critics of government regulation and market failure. The regulatory dilemmas facing governments provide a good example of some of the problems faced by governments when they attempt to create a regulatory framework for the higher education sector.

In the first section the basic forms of market failure will be identified. In the following sections the concept of market failure will be applied to higher education markets and finally the nature of higher education markets would be examined.

Market Failures and Economic Regulation

Education - through the creation of human capital - is considered to be an important part of the development of any economy (Organisation for Economic Cooperation and Development, 2004). In the past, most governments around the world have not only invested in physical capital (infrastructure) in their respective countries by funding the construction of such things as roads, ports, electricity wires and gas pipelines, but have also invested in the education of their human resources.

This notion that education can enhance the productivity of labour is not a new one. As far back as 1776 Adam Smith explained that:

> "that a man educated at much expense and time to tasks that require dexterity and skill

> may be compared to an expensive machine that adds more to earnings than the cost of operating it."

This notion that investment in education can raise the productivity of the workforce and generate returns to investors has been embodied in economic theory in the form of Human Capital Theory. This theory assumes that investment in human resources is similar to that in physical capital, in that costs are incurred in the investment process in the expectation that future economic gains will be made. Human capital orthodoxy views expenditure on education, whether it is by an individual, a business or government, as an investment (Becker, 1964; Mincer, 1958; Schultz, 1961). Like any investment there must be a rate of return. This rate of return manifests itself in the form of higher incomes for those individuals who invest in education for themselves and higher productivity and growth for the businesses and nations that do so. From the individual's point of view the cost of investing does not just include the cost of education fees etc. but also the income forgone by studying full-time and staying out of employment.

In terms of productivity, education has been seen to enhance the productivity of workers by imparting the basic skills and knowledge of the three 'R's, by providing highly vocational skills and techniques and by encouraging appropriate values, desirable work habits, agility of mind and ability to solve problems. Not only will the productivity of labour be enhanced by education but also it may lead to the better use of other inputs and to the introduction of new technology. A wide variety of studies have been undertaken on the link between investment in human capital and growth rates. The Organisation of Economic Cooperation and Development in its studies of the link between growth in per capita output and variety of input factors found that there was a significant relationship between growth in output and investment in human capital (Table 1). According to the figures in Table 1 this relationship is by no means a uniform one across nations, and is not the only factor that promotes growth but was found to be both consistent across all Organisation of Economic Cooperation and Development countries and a significant contributor to the growth process.

Support for human capital theory is by no means universal. Generally human capital theory views the higher average earnings that the more highly educated and trained people get as evidence of their higher productivity and returns from investment. Criticism of human capital theory is general on the basis of what is known as the "screening hypothesis" (Arrow, 1973; Blaug, 1985). According to this hypothesis although there is a correlation between the average level of formal education people have, and average level of income they receive, this does not necessarily signify that the education creates the extra income earning capacity directly if the formal qualifications are being used as a "screening" devise. It is possible that employers pay higher wages and salaries to holders of higher qualification because they expect these people to be of higher intelligence and diligence than those without them. That is, the formal education process acts as an indictor of intelligence rather than a creator of abilities (Maglen, 1995).

It would appear that there is some substance to this hypothesis but it can quite easily be taken too far. It would be difficult to argue that a person who has invested in his education as a doctor, dentist, engineer, accountant etc was just doing so in order to pass a screening test. Cleary employers of these people are very interested in the skills they have obtained through their education. Investment in some education, at least, increases the productive level of the workforce and helps to contribute to higher level of output.

Even if it can be shown that investment in education leads to increases in the productive capacity of an economy this does not necessarily justify government intervention on economic grounds. As private investment in human capital creates private returns, then it would be expected that this would create incentives for individuals to invest in education. If higher levels of education lead eventually to higher incomes for a person then there is an incentive for them to pay for it. If a firm benefits from its workforce being more highly educated, then there is an incentive for it to invest in the human capital of its workers. To justify government assistance there needs to be a demonstrable market failure that leads to sub-optimal levels of investment in human capital. In other words there needs to be a social return on investment that exceeds that of the individual returns; perhaps because of the external benefits that flow from investment in education of individuals and firms to other people. This then brings us to the question of whether there are market failures in the education market (Quiggin, 1999).

Generally economists evaluate whether governments should intervene in markets by making use of the notion of "market failure". If markets fail to bring about an optimal level of resource distribution then governments may be inclined to intervene to improve matters. Resources are said to be efficiency allocated if they are placed in their most valued uses where the units of each homogenous resource yield identically valued returns in all uses to which they are put. Or, in other words, are allocated in such a way that they cannot be reallocated to other uses without reducing overall returns to them. A market failure, therefore, generally embodies some force that prevents the efficient allocation of resources from occurring. Generally market failures arise in general terms because the transaction costs involved in overcoming the impediment to an efficient allocation of resources is too high for participants to pay. Government intervention is beneficial if the government can use its powers of coercion to reduce transaction costs for individual participants. For this intervention to be efficient the benefit from the government intervention needs to be greater than the transaction costs involved in enforcing the rule. One example of this process was given by North and Thomas (1976) with regard to the protection of private property rights by the government:

> Governments take over the protection and enforcement of property rights because they are able to do it at a lower cost than private volunteer groups.

In this case the costs of government intervention are regarded as being less then the costs associated with private agents simply making their own private arrangements.

This notion of the costs of government involvement is an important one and should not be overlooked. Almost all market arrangements generate results that fall short of achieving the ideal allocation of resources. For government intervention to improve circumstances, it is assumed that the losses accruing due to market failure are significant; that the government intervention is effective at overcoming the market failure, and finally that the intervention itself imposes only slight costs to the economy as a whole. In many cases the costs of market failure are too trivial to cause any concern or bother about government intervention, or alternatively the costs of government intervention are too high to improve the circumstances.

The latter point is an important one to consider. Government intervention is often a flawed instrument when confronting market failures. The political process that formulates government policy often embodies the expression of differential interests of citizens within a country who are often more concerned with distributional issues rather than the alleviation of

market failures. Over the past thirty years the economic literature on "political failures" or the failures of regulation has been extensive. In fact it is quite possible – and indeed very common – for governments to respond to the existence of significant market failures by implementing policies that make things worse.

Returning then to the causes of market failure they are generally derived from a variety of forms. One of the main types of market failure that justifies government intervention is where a good or service has "pure" public good characteristics. A pure public good is one, whose consumption has the characteristics of being non-rival and non-exclusive (Samuelson). A good is non-rival if consumption by one person does not restrict its availability for consumption by others (that is, additional consumption does not add to costs). A good is non-exclusive if its availability to one person makes it also available to anyone else who wants to use it. As a consequence, it is difficult, or impossible, to charge people for using non-exclusive goods - the goods can be enjoyed without direct payment. The classic example of a pure public good is national defence. Defence is non-exclusive, since, once a nation provides for its defence, all of its citizens enjoy its benefits. Defence is also non-rival in that the marginal cost of providing it to an additional person is zero.

Related to the notion of pure public goods is that of externalities. Externalities are the cost and benefits derived from production and consumption that are not fully accounted for in the price and market system. Traffic congestion and pollution, for instance, are created by the consumption of motors cars. Neither the producers nor the consumers fully pay for these costs so they are not accounted for in the price system. In other words the social cost of production and consumption are greater than the private costs. This is not to say that it is not possible to "internalise" external costs through volunteer contract between parties. In some cases however this does not occur because the transaction costs are too high for the individual involved and it is easier for the government to take steps to internalise the costs.

Besides the pure public goods and the existence of externalities another possible source of market failure is from information asymmetry; that is, where most consumers have little ability to reliably gauge the quality of a particular product or service. If this is the case, it may then be possible that the resulting resource allocation is less efficient than if consumers are fully informed. It is possible that information asymmetries are relevant when looking at the regulation of higher education markets. If consumers are sufficiently ill informed than it might adversely affect resource allocation. In such a situation government intervention might improve matters. Bearing in mind these types of market failure, it is possible to see just how they might apply to higher education markets.

Education and Market Failures

Bearing in mind the fundamental sources of market failure it is possible now to see how these principles apply to the provision of higher education. The first point that should be acknowledged is that education is fundamentally a privately consumed good as it is exclusive in nature, but may be considered a quasi-public good if a significant amount of benefits or costs (externalities) flow from its production or consumption such that they affect third parties. In the past the possible existence of positive externalities that flow from education has been used to justify the subsidisation of both government and private providers of higher education (Maglen, 1990; Quiggin, 1999; Gemmell; 1997). The split of funding between private and public sources of higher education in many countries is a recognition by

government authorities that the benefits from higher education accrue both to the individuals involved and society as a whole (see Table 2).

Although it is quite clear that there are benefits to individuals from investing in education it is less clear that there are substantial additional returns to economies as a whole from investment in education. For there to be a greater social return to investment in education than the private return, then not only must graduates be more productive themselves, but also they must make other non-graduates around them more productive as well. The case for government subsidizing higher education therefore rests on there being beneficial spill-overs to others within the jurisdiction of the government providing the subsidy. Any spill-overs that flow outside of the government's jurisdiction of course cannot be counted as they are of benefit to people in other countries.

Studies have been conducted and have generally found that positive externalities exist; although not to the extent of covering as high a level of costs as is presently the case (see for instance Maani, 1997). Even if it justifies some subsidy of higher education, the existence of externalities does not provide us in this case with any justification for the direct regulation of higher education institutions. Instead, economic justification for this form of regulation must be found elsewhere.

One possible area is in the provision of information. For students to make rational choices about which qualification they would like to enrol and study in, it would be thought necessary for them to have sufficient information about the quality of the alternative courses available to them. Although it may be possible that they have some information about the general reputation of providers like older, well established, and therefore well known universities, in general, students might not be expected to have a very substantial knowledge about the standards of many of the other higher education providers. It is quite possible that students might like to undertake shorter and even low quality courses if the costs were less than high quality qualifications. At times the distinction between the quality of the various courses offered by different providers may be hard to distinguish.

Another area where information may be deficient is in the factor of risk. Often students undertake qualifications that can extend over a number of years. In most countries, for instance, most degree qualifications take three or four years of study to complete. Students who commit their funds and time to courses of study of this length might be concerned if there is some degree of financial uncertainty facing the provider of their choice. This problem is particularly important in higher education markets where private institutions operate without the backing of the government.

A third possible cause of market failure is the risk of third-party losses in higher education markets due to "systematic instability". Systematic instability occurs when breaches of promises by one institution cause distress to other institutions that are well managed and commercially sound. In financial markets this instability has been used as a rationale for the establishment of regulation in the form of prudential supervision (Neal, 1997).

The economic regulation, therefore, of higher education does have some justification according to economic theory. Whether the development of regulatory arrangements that have occurred around the world in recent years has been in accordance with this theory, however, is another matter.

Educational Institutions

In recent years the higher education sectors of most countries have expanded considerably and government expenditure on higher education makes up a significant portion of GDP (Table 2). Given the substantial support given to the delivery of higher education, governments have tended to also extend their formal regulation of higher education institutions. The rapid expansion of higher education all around the world has meant that a number of countries have experimented with different forms of accountability.

To a large degree, this has occurred because of the changes that have occurred in the governance and management of higher education institutions and the attitudes of governments to the role that higher education plays. Traditionally higher education institutions have been governed by either of two main models: what Jose-Gines Mora calls the "Anglo-Saxon" model and the "Continental" model. In countries like the United Kingdom, Ireland, Canada, Australia, New Zealand and the United States, universities have been governed under the former model. Under this model, power in the universities rests largely in the universities themselves. Universities are separate legal entities, own property, directly employ staff and to a degree govern their own destinies. The role of the government is limited to providing funds and setting the general criteria as part of its higher education policy. This approach can occur for both government owned and privately owned universities, as is the case in the United States. In continental Europe on the other hand, traditionally, universities were under a firmer degree of control of the state. In western and central Europe the government has traditionally controlled finance, programmes and appointments to senior academic positions, as well as management positions and employed staff as public servants.

Over the past ten year there has been a degree of convergence between the two models. In particular there has been a process of giving continental style higher education institutions greater autonomy, and then subjecting them to external formal regulation that provides quality assurance processes (Dill, 1997, 2000; Mora, 2001). In countries such as the United Kingdom, Australia, the United States and New Zealand, where universities have traditionally been fairly autonomous bodies, there has been an increase in the degree to which they are formally 'audited' or 'assessed' by statutory bodies. In countries such as those in continental Europe where the universities have a strong history of state control there has been a movement towards greater university autonomy (Mora, 2001). In both cases, therefore, there has been a tendency for universities to have a degree of autonomy from the government and be influenced by market pressures while at the same time be subjected to quality assessment and assurance systems.

In the New Zealand case both of these trends have occurred. On the one hand the largely Anglo-Saxon style autonomous universities are now more the subject of external regulation while on the other hand, the formerly Departmentally controlled polytechnics and colleges of education have been given institutional autonomy – subject to external regulation. In the United Kingdom and Australia a similar process has occurred. In the former the Further Education Colleges and in the latter the Technical and Further Education Institutes have been gradually disestablished from Departmental control and established as separate legal entities. At the same time these institutions have become the subject of formal regulatory arrangements, as have increasingly the universities in both countries.

Formal regulation tends to take on one of three forms: namely: accreditation, assessment and academic audit (Dill, Massy, Willams and Cook, 1996). These forms of quality assurance

programmes have been used for a variety of purposes and are quite distinct from each other but often are used in some combination. Accreditation is a process of external quality review and is used by higher education institutions to provide guarantees that certain standards are met. The United States has had the oldest accreditation system that has evolved over 100 years of accreditation by private, non-profit organisations. Accreditation basically requires the determination by an external body whether an institution or programme meets threshold quality criteria and thereby certifies to the public the existence of minimal educational standards. It is criterion referenced; that is, it compares observed performance against preset standards, usually determined by the accrediting agency. Assessment involves the evaluation of the quality of specific activities – such as education or research quality – within academic units. Assessment goes beyond accreditation to make judgements about academic quality levels rather than binary judgements relative to threshold standards. Assessments – or systematic programme reviews as they are often referred to – have been used in the United States for a very long time and in recent years has spread to other countries around the world.

Academic audit is the third and most recent type of quality assurance process. Academic audit is an externally driven peer review of internal quality assurance, assessment and improvement systems. Unlike assessment, audit does not evaluate quality, instead it focuses on the processes that are believed to produce quality and the methods by which academics assure themselves that quality has been attained. Its purpose it not to assess academic performance but to verify the rigour and reliability of each institution's system for assessing the quality of teaching and learning as well as its quality assurance procedures. This form of assurance has been implemented in Hong Kong, New Zealand, Sweden, the Netherlands and the United Kingdom. It emerged in the late 1980s and early 1990s in the United Kingdom following concern expressed by the government that the rapidly expanding university sector was leading to a decline in quality teaching (Dill, 2000). In the United Kingdom there had always been a system of inspection of the polytechnics and after the conversion of polytechnics to universities in 1992, the Higher Education Quality Council was established to monitor the quality of teaching in all universities – old and new (Brown, 2000, 2001). The spread to the other countries mentioned earlier was a result of similar pressure from governments for greater accountability on academic quality in the university sector.

Although quality assurance measures are new to universities outside of the United States, they are by no means unheard of at a professional level in many countries and in the higher education sector more generally. In many countries professional degree qualifications have been the subject of accreditation process such as by professional agencies in professions such as Medicine, Accountancy, Dentistry etc. More generally in the tertiary education sector it has been very common in a range of countries for vocational training qualifications (and even non-university degrees) of various colleges (government and private), to be accredited by industry boards of one type or another. To some degree the trend towards quality assurance in countries such as the United Kingdom, Australia and New Zealand is a part of the process of convergence of the higher education and vocational sectors more generally.

The main justification for quality assurance regulation is that it helps to reassure governments that the funds forwarded to higher education institutions (both government and private) are used in an accountable fashion. If governments are to forward funds for "public good" purposes, then presumably they have an interest in being assured that this money is being spent in an effective manner. Even in the United States where quality assurance is privately delivered, government funding of higher education is tied in with quality assurance regulation

as it is often a condition for government funding of both government owned and privately owned institutions.

From an economic point of view the main justification for imposing quality assurance programmes is to provide information to students that they would not easily otherwise get. Of course there is no particular reason why such a structure should be a government owned one. As mentioned earlier, the United States has had a long experience with this process going back to the nineteenth century. This is a product of the extensive size and scope of higher education institutions in the United States, which would be tremendously confusing for students and employers outside of the elite institutions. The positives and drawbacks from government control of the quality assurance process are quite straight forward. On the positive side it is possible that a single, monopoly, regulator of standards provide students with a consistent approach to information dissemination. Further it is possible that a government body would be able to reduce transaction costs of the establishment and bring about coordination of the quality assurance programmes. This is far more likely in the case of countries that do not have a history of external quality assurance regulation. In the case of the United States it is unlikely that a government body would be able to reduce transaction costs below that of the existing private agencies. Indeed the present structure provides some scope for competition between accreditation agencies which would encourage them to act in an innovative and efficient manner. Monopoly control of the accreditation process by a single government regulator always runs the risk of an overly bureaucratic and potentially inefficient approach to regulation.

This process of accreditation, assessment and audit of qualifications and institutions help to reduce the problems of information asymmetry. It is, however, an assurance that minimum requirements are met and generally provides no more information about the level of quality achieved. Typically, no information on the relative standing of providers are given, such as the rankings of a number of international higher education institutions. Furthermore they often provide students with little information about the basis by which the regulator judges quality assurance standards. Students are given an indication that accredited providers meet a regulated minimum standard but are given no indication of what that minimum might be.

Licensing and an insistence on a minimum degree of competence is a common response on the part of governments in situations where it is difficult for members of the public to gain reliable independent information about the quality of a product or service. In many countries for instance electricians, plumbers, doctors and dentists all have to be registered with a legislated registration board. The general purpose of this approach is to ensure that consumers are able to be certain that professional service providers meet certain standards.

One difficulty with this type of regulation is that it can often either impose a significant burden on providers, which is then passed onto consumers in the form of added costs and prices, or can be used by providers to exclude entry into the market. This can occur in the cases where the costs of meeting the licensing requirements are too burdensome, which then can have the effect of restricting competition by making new entry too difficult.

Another form of market failure that might occur in higher education markets is that of ‘systematic instability”. This is of course more a problem with systems that have private institutions, after all with government institutions the taxpayers bear all of the risk of financial failure on the part of educational institutions. It may have a particularly important effect at the national level. Increasingly students are travelling to foreign countries, often to private or

private-government partnership institutions. The collapse of a single very large institution in a particular country could lead to a general aversion on the part of international students to study at all educational institutions in that country.

Quality assurance does not appear to give students much additional knowledge about the degree of risk associated with different providers. In the case of government owned universities it would be expected that the government would bail out any of them that get into financial difficulties. In the case of the private institutions quality assurance regulations generally give no assurance to students that prudent commercial behaviour on the part of a higher education institution is followed in the way that prudential supervision of the financial sector is done. Quality assurance regulation instead concentrates more on establishing and maintaining the quality of programs rather than giving students any knowledge about the degree of risk involved in enrolling with any particular institution.

The failure of an institution is not necessarily a bad thing. After all, one of the generally accepted benefits of a market is that there is a tendency for productively inefficient operators to be either forced out of the market or taken over by more efficient operators. Resources can then be reallocated to providers, which achieve a greater level of productive efficiency. The problem of systematic instability means that the regulator must prevent this institutional failure spreading to other providers. At the same time it must avoid committing itself to the financial support of institutions in that this can lead to the added difficulty of 'moral hazard' — that is, the possibility that promising to financially support institutions in difficulty might encourage commercially risky activity.

In the American case one of the main purposes of the quality assurance programmes is to encourage cross credit arrangements between institutions. This acts to facilitate the transfer of students from the failed providers to others so that they could complete their qualifications at no extra cost. What this does is effectively eliminates the risk to students of attending a private institution. Theoretically then, systematic instability should not exist if students perceive that the qualifications they are studying for are not tied entirely to the financial success or failure of the provider they attend. If students have this perception then they should not feel as threatened by the collapse of another provider besides their own.

A problem might arise, however, with the development of qualifications by the providers themselves. Although it might be expected for most programs to have equivalents at other providers, to which students could be transferred in the case of institutional failure, this might not always be the case if a PTE engages in the development of innovative programs. Any statutory provision that providers maintain transfer arrangements might safeguard the interests of students and in most circumstances would be welcomed, but might be at the expense of the dynamic creation of new courses, where this could not be established.

Conclusion

Amongst other things the regulation of the sector does help to some degree to overcome the problems of information asymmetry and systematic instability without eliminating entirely the possibility of them occurring.

The protection of student's fees and the ability to transfer credit for work completed would seem to be the two main elements that protect the interests of students and reduce the

possibility of systematic instability. In terms of information asymmetry the quality assurance process would appear to give students some information about the quality level of a provider's programs. Despite these benefits it does not seem obvious that the regulations are specifically designed to overcome potential market failures arising from information asymmetry and systematic instability. Consequently, it is unlikely that they were expected to be entirely successful in overcoming the associated problems.

Future studies of formal quality assurance measures would do well to consider the role that a regulator can play in lessening the difficulties associated with these two possible causes of market failures as well as attempt to design a regulatory structure that imposes as few costs as possible on providers and students. One approach might be to follow the lead of financial market supervision as it is presently practiced in a number of countries which require the disclosure of additional information by the education providers itself, concerning both the quality standards met by them and the financial soundness of institutions. A greater disclosure framework would allow for the further development of the higher education markets while at the same time enable students to make more informed choices about where they wish to study while at the same time provide incentives to institutions to be both educationally and financially sound.

Table 1: Decomposition of Changes in Annual Average Growth Rates of GDP per capita; 1980s to 1990s

		Contribution from					
	% change in output per capita growth rate	Investment share	Human capital	Population growth	Variability of inflation	Size of government	Trade exposure
Australia	0.80	-0.16	0.17	0.46	0.05	0.03	0.57
Canada	-0.60	0.24	0.19	-0.10	0.01	-0.02	0.60
France	0.04	0.01	0.35	0.27	0.23	-0.02	0.42
Ireland	1.21	-0.17	0.54	-0.75	0.35	0.13	0.46
Netherlands	0.97	-0.04	0.43	0.32	0.07	0.10	0.25
Spain	-0.64	-0.19	0.42	-0.05	-0.20	0.02	0.33
NZ	-0.26	0.33	0.21	-0.47	0.68	0.06	0.44
Sweden	-0.64	-0.19	0.42	-0.05	-0.20	0.02	0.33
UK	0.01	0.08	0.44	0.05	na	0.03	0.25
USA	-0.19	0.19	0.07	-0.06	0.13	0.07	0.65

Source: OECD, 2004

Table 2: Tertiary Education Statistics for the OECD

	Population that has attained tertiary education years 25 to 64, 2002		Expenditure on Higher Educational Institutions as a Percentage of GDP 2001		
	Vocational education and training	Higher education	Public (a)	Private (b)	Total
Country	**%**	**%**	**%**	**%**	**%**
Australia	11	20	0.8	0.7	1.5
Austria	7	7	1.2	na	na
Belgium (c)	15	13	1.2	0.2	1.4
Canada (d)	22	21	1.5	1.0	2.5
Czech Republic (c)	x	12	0.8	0.1	0.9
Denmark (e) (f)	5	23	1.8	na	na
Finland	17	16	1.7	na	na
France	12	12	1.0	0.1	1.1
Germany	10	13	1.0	0.1	1.0
Greece (e)	6	13	1.1	na	na
Hungary	x	14	0.9	0.3	1.2
Iceland (e)	6	20	0.9	na	na
Ireland (c)	10	16	1.1	0.2	1.3
Italy	x	10	0.8	0.2	1.0
Japan (f)	16	20	0.5	0.6	1.1
Korea	8	18	0.4	2.3	2.7
Mexico	3	2	0.7	0.3	1.0
Netherlands	3	22	1.0	0.3	1.3
New Zealand	15	15	0.9	na	na
Norway	3	28	1.3	na	na
Poland (e)	x	12	1.1	na	na
Portugal (e)	2	7	1.0	0.1	1.1
Slovak Republic (c) (e)	1	10	0.8	0.1	0.9
Spain	7	17	1.0	0.3	1.3
Sweden c)	15	18	1.5	0.2	1.7
Switzerland	9	16	1.3	na	na
Turkey (e)	x	9	1.0	na	na
United Kingdom	8	19	0.8	0.3	1.1
United States (d)	9	29	0.9	1.8	2.7
Country mean	8	16	1.0	0.3	na

Note: x indicates that the data is combined in the higher education column
a)Including public subsidies to households attributable for educational institutions.
b) Net of public subsidies attributable for educational institutions.
d) Post secondary non-tertiary included in tertiary education.
e) Public subsidies to households not included in public expenditure but private expenditure
f) Post secondary non-tertiary included in both upper secondary and tertiary education.
Source: OECD Education at a Glance

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