KNOWLEDGE AND HIGHER EDUCATION: PUBLIC/PRIVATE 'GOODS' DIVIDE

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Abstract

While it is generally understood that higher education is a mixed private/public good, researchers rarely look at what within this mix is, or at least can become, private goods or private goods. Knowledge as a product of higher education is generally considered a predominantly public good. However, frequently researchers ignore rivalry and excludability in obtaining knowledge and often confuse positive externalities in education with the characteristics of a public good. Disaggregating knowledge into stocks and flows of knowledge and, further disaggregating flows into processes of acquiring knowledge and the process of expanding the knowledge base might help in solving the private/public 'good' divide puzzle. This paper also looks at the economic properties of the operational functions of a higher education institution and discusses their potential of becoming predominantly public or even global goods. The study considers implications of the public/private nature of knowledge and education for higher education reform.

Keywords: *Public goods, externalities, market failure, higher education reform*

1. INTRODUCTION

Samuelson (1954) defined public goods in terms of two characteristics, non-excludability and non-rivalry in consumption. Non-excludability implies that no one can be prevented from benefitting from a public good and non-rivalry means that public goods cannot be depleted by individual consumption. As, according to the economic theory, the market fails to deliver public goods at a socially desirable quantity due to the concentration of the costs of provision on the supply side and the widely distributed benefits of consumption, these goods must be provided by the government. The author acknowledges that education is a service but uses a generic term 'public goods' in higher education.

It is rather common in analysis of higher education to look at the phenomena at a highly aggregated level and consider education as a whole, which creates definitional ambiguities. For example, Marginson (2009), quoting Stiglitz (1999) for presenting an example of knowledge being very close to a pure public good, doesn't go far enough in distinguishing between the stock of base knowledge, where the statement would be largely true, and the flows such as obtaining existing knowledge and building new knowledge where rivalry in consumption and excludability clearly exist. The definitional 'aggregation' of knowledge leads Marginson (2007) to introducing an additional global attribute to a public good, which is unnecessary if the stock/flow divide in knowledge is properly applied as shown below in Sections 2 and 3.

Ideology also contributes to misperceptions in higher education research. Some well-celebrated authors such as Giroux (2014, 2015), for example, engage in purely ideological exposition of the consequences of the modern neoliberal approaches to education funding and management where the consensus has been achieved years ago but fail to propose any reasonable solution to the problem. The common sense though suggests that the only way to defeat neo-liberalism is to offer a solution to the issues associated with funding and quality in education that would be significantly better than rampant commercialisation offered by neo-liberals. In addition, ideologists use a high level of abstraction in their discussions, which resulted in a severe negative effect on the measurement methodology in higher education. For example, Carnoy, Froumin, Loyalka & Tilak (2014) suggest to measure the value of the benefits from higher education in terms of vague and unobservable 'social values' that are useless for any practical decision making with regards to public funding and the quantity of socially desirable output.

A number of studies on higher education reform ignore the fact that the decision regarding provision of public goods is ultimately the choice of the national governments or, in some rather rare cases, private

individuals and that the potential of being a public good doesn't necessarily leads to that end in reality. In fact, higher education is a mixed and not a purely public good in all countries around the world and remains a mixed good even in a short list of countries where higher education is provided free of charge (Kooij, 2015).

The absence of examples of education as a purely public good in the real world resulted in a widespread confusion between the concept of a public good and the concept of externalities. Authors frequently conclude that the reason why education is a public good is the fact that it entails positive 'spill-over' effects (see, for example, Glater, 2011), while in reality positive externalities can logically stream from private goods as well. The major source of confusion might be the ideology that frequently engages in normative economics can pronounce public the goods that are obviously private goods such as bread and shoes (Mozsar, 2003).

Finally, all current attempts to reform the higher education sector known to the author look at the educational institutions or even the industry as a whole, to a large extent avoiding in-depth analysis of the economic reasons for existence of poor quality tertiary education and omitting analysis of possible market failures within the institutional structure that result in such inefficiencies as duplication in teaching and learning, poor quality and inflated costs (Altbach, Reisberg & Rumbley, 2009). The lack of micro analysis of operational issues of a higher educational institution might be the result of the political and administrative pressures upon academics associated with the sensitivity of the matter, which over time created a psychological barrier for conducting research in this area.

The rest of the paper is organised as follows. Section 2 looks at the stocks and flows of knowledge; Section 3 discusses how separation of operational functions currently assigned to most individual educational institutions can result in creation of pure public and global goods in higher education; Section 4 considers some policy implications of the existing public and private goods in the higher education sector; Section 5 concludes.

2. DISAGGREGATING KNOWLEDGE AS A PRODUCT OF HIGHER EDUCATION

High level of aggregation of the 'knowledge' concept in research leads to misperceptions and difficulties in its measurement for economic analysis. One such misperception is a general assumption that knowledge doesn't depreciate with a popular example of the Pythagoras theorem (see, for example, Ofek, 2001; Kaul, Conceicao & Le Goulven, 2003), with the knowledge of this theorem not diminishing as the next person absorbs it. While it is true that the Pythagoras theorem is not disappearing as more people become aware of it, which fulfils the non-rivalry in consumption condition, this fact has little relevance because the objective of economic and policy analysis is to maximise the amount of knowledge within the society and not just preserve the theorem and ensure public accessibility to it. The Pythagoras theorem is an example of knowledge base, existence of which constitute a necessary but not a sufficient condition for building aggregate human capital stock.

A distinct characteristic of knowledge as a form of capital is that it is not consumed when used but depreciates when unused (Chen & Edgington, 2005). Knowledge is forgotten rather quickly by individuals unless this knowledge is used in everyday life or at work as our brains erase abstract concepts and techniques within a very short period of time (Boone, 2008). Knowledge obtained while studying such subjects as pure math, economics and statistics is not used by an absolute majority of managers, which puts a heavy burden on young employees in using their knowledge at the workplace and frequently turns established institutions into a burden to knowledge transmission rather than facilitator of building the knowledge stock. Keeping the volume of knowledge and not the number of knowledge items as the concept to be measured and assuming that knowledge availability is just a necessary but not a sufficient condition for the level of aggregate volume of knowledge might provide a better guidance for economic modelling and evaluation of possible options for reforms, especially in the higher education sector.

For the purposes of analysis I would suggest disaggregating knowledge into stock of knowledge, which is equal to the volume of knowledge accumulated by the society at any particular point of time and flow

of knowledge, which is the change in the volume of knowledge over a period of time. Worth to mention again that the flows of knowledge can be positive and negative, if a possibility of knowledge depreciation within the society exists. Further, it is necessary to distinguish between knowledge dissemination and creation of knowledge because these two processes are fundamentally different in nature and require different approaches to their optimisation.

Dissemination of knowledge is the process of facilitating existing knowledge to students. Teaching academics play a crucial role in this process not only by providing guidance to the students in their studies but also teaching the students general skills and changing student attitudes not only with respect to their studies but also with life as a whole. Poor quality education, manipulating student results and neglecting the students' needs might result in a severe negative effect and a waste of national resources allocated to education. However, disseminating knowledge is not enough in presence of knowledge depreciation. The recipients of knowledge must have a need for the most of the obtained knowledge at least for work in order to retain it. Therefore, we must create a need for lifelong learning within the society.

The society builds knowledge by conducting research, which to a large extent is the only source of the positive flow into the stock of base knowledge that not necessarily become disseminated to a wider society as an addition to the aggregate knowledge stock. In most cases research requires instructional support and inspirational drive from senior and more experienced academics and, to become eventually a flow into the aggregate stock of knowledge distributed to a wider society, requires a dissemination channel as described above. A certain part of the aggregate knowledge stock, - and most early research effort represent an example of this, - might be not explicit at the creation stage. Tacit knowledge takes some time before it is enriched and transformed into explicit knowledge that can be used in productive economic activities (Hagel, 2009). Importance of tacit knowledge is another challenge for measurement of knowledge input in economic and social modelling.

The knowledge of stocks and flows are summarised in Figure 1 below.

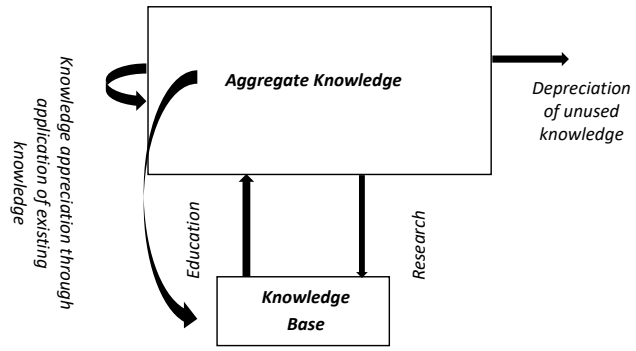

Figure 1: Flows and stocks of knowledge

While it can be reasonably concluded that the stock of base knowledge can be purely public good, the aggregate knowledge is definitely a private good with positive externalities. The logical conclusion from the discussion above is that society must not concentrate purely on the knowledge base but also strive to maximise the aggregate volume of knowledge or, as we frequently call it, human capital and, therefore, use the volume of human capital for economic modelling and policy assessment. Most modern national statistical agencies such as the Australian Bureau of Statistics (ABS, 2012), rarely go beyond the simplicities of using the research and development expenditure as an input in economic models, which might result in misleading estimates. The stock of knowledge in the knowledge base is a necessary but not a sufficient condition for of achieving a higher level of aggregate knowledge as it creates only a potential that must be yet realised by the society. Although this paper is not trying to provide any technical improvements to the knowledge measurement, it is an attempt to lay down some foundations for such measurement, which would allow to evaluate the impact of education and research for purposes of developing a socially desirable higher education policy.

The qualitative analysis of this study should be sufficient to show the areas where neo-liberal economics fails to perform in this respect. Most importantly, elite education as advocated by the neo-liberal approach to higher education is not the way to maximise the aggregate stock of human capital, especially if, as it will be discussed in Section 3, there is a natural monopoly in some educational functions and the marginal cost of educating an extra student can be approximately zero.

3. ECONOMIC STRUCTURE AND SOURCES OF MARKET FAILURE IN HIGHER EDUCATION

Higher education, along with the primary and secondary education, provides the services of knowledge dissemination to the wider society and, therefore, is responsible for the flows of knowledge from the knowledge base to masses and building the knowledge component of the aggregate human capital stock. The issue with the traditional university system is that, to a large extent, it is self-managed, which not efficient in presence of multiple market failures defined as inability of a free market to produce a socially desirable outcome and either produces too little or too much of a good. The three major sources of market are lack of competition, public goods, and externalities.

Lack of competition results in a situation where firms can restrict the quantity of output to maximise their profits, which leads to a waste of scarce resources. Further, some types of goods such as public parks and national defence are typically supplied by the public sector because private sector will never supply them is socially desirable quantities due to the uneven distribution of costs and benefits among suppliers and consumers. Finally, externality is an effect of a market transaction on a third party with the usual view that education results in positive externalities for the society.

It is too simplistic to consider education as a whole and arrive to the conclusion that the market is unable to produce enough graduates and, therefore, is a public good (Stejar, 2011). The process and phenomena of education is far more complicated than that and, as shown below, possesses all three source of market failure. It will be shown further in this section that higher education market simultaneously exhibits negative and positive externalities as well as a complex mix of a lack of competition in some areas and, at the same time, an excess of competition in others.

Mikhailitchenko (2017) suggested that the knowledge dissemination delivered by higher educational institutions with operational functions that can be subdivided into content, assessment, administration, and teaching. Currently academics in higher educational institutions duplicate efforts of each other by developing courses and teaching materials for subjects that to a large extent are standardised and require a unified effort or are undergoing an active process of standardisation (Altbach et al., 2009). Similar situation exists in the assessment, where assessment papers are drafted by individual academics for the subjects they coordinate and not necessarily consistently examine students' knowledge in terms of depth and coverage.

McLean argues that the economic structure of these two functions, being information goods (Bates, 1990), represent a natural monopoly, a single firm that can be deliver content and assessment services at the lowest possible cost and with higher quality and consistency than it is done by the existing 22,000 higher educational institutions worldwide. Natural monopoly is able to exploit economics of scale and implies that one firm can exhaust the market demand at the lowest possible cost and competition in these two areas must be restricted. The structure of content and assessment calls for a free universal access to hi-tech subject materials and practice test questions with the fixed costs covered from the budget. Final exam questions can become available for academic administrators from very large test banks with questions and input information for individual questions selected randomly and printed immediately before the exam.

Academic administration is concerns with maintaining student records, organising enrolment and examinations and, according to McLean, would be most cost-efficient and effective with respect to quality if the structure of the market for academic administration is an oligopoly, meaning that there is a need for just a few major firms on the market with an option to have smaller ones in areas with low population density. Academic administrators must be monitored by a government body to ensure

quality, integrity and consistency of procedures as well as their economic behaviour with respect to costs to avoid collusion typical for this market structure. Costs of services provided by academic administrators can be met by individual students and might not exceed a hundred dollars per subject for organising the exam venue, marking, keeping record and providing a reasonable profit margin for the suppliers. With marking going totally on-line, it is possible to control the quality in real time and select the most qualified markers and administrators who demonstrate integrity and high level of professionalism.

Finally, teaching as per McLean, doesn't require any regulation except transparency in student performance and qualifications and experience of individual instructors to allow for informational efficiency. This function can be described as monopolistic competition, a market structure with a large number of suppliers competing each other by price, quality and facilities provided. Separating teaching from the rest of the operational functions will remove the incentive to cheat for academics and improve the quality of education, - the area where the sector is impotent to solve the problems, – while high level of competition will result in exit of non-performing instructors from the market and in a rewarding career for those who are able to deliver the quality output.

Currently all four functions are performed by almost every individual institution, resulting in multiple problems and systemic failure in quality control. The Tertiary Education Quality Standards Agency (TEQSA) closely follows the steps of its predecessor Australian Universities Quality Agency (AUQA) (Bradley, 2008) and, for this reason, is not expected to provide any significant changes beyond pure manifestation of the quality assurance as it allows the universities remain in charge of their own quality control in presence of market failure and an incentive to manipulate the grades for economic gains (Massaro, 2013). An absence of academic experience of the TEQSA commissioners as well as the complexity of market failure in the sector puts a heavy burden for higher education reform.

Firstly, there is a complex mix of market structures within operational functions of universities with the natural monopoly in content and assessment, oligopoly in academic administration and monopolistic competition in teaching. This implies that all attempts to reform the industry without splitting the universities are destined to fail. The reason for this failure is the resistance of economic agents such as academics, administrators, students, publishers, etc. who have no incentive to make a change and the domineering practice to delegate the bulk of quality and efficiency control to the universities, where the quality is measured not by the quality of output but by the qualifications of academic staff, which is an indicator of the potential of producing such output but not necessarily the evidence of the actual quality. Final grades and the number of graduates might become a good proxy for measuring aggregate human capital if the problems with quality in higher education are finally solved.

Secondly, a simultaneous existence of positive and negative externalities in higher education further complicates the matter. Although positive externalities of higher education have been extensively researched in the literature (see, for example, McMahon, 2002; Chapman & Lounkaew, 2015), the negative externalities in higher education have not been sufficiently researched yet due to the sensitivity of the issues involved and the consequences faced by academics who wish to research this area Mikhailitchenko (2016). It must be acknowledged though that some issues raised by Giroux (2014; 2015) such as unethical behaviour of academics that spreads into teaching practices effectively are a taboo at universities and need a much broader discussion than currently is available. Corrupt practices such as inflation of final grades or leaking the exam questions to the students are channelled to the broader society from higher education and are becoming a new norm, reinforcing the system where competition is restricted and non-productive activities are rewarded.

Public goods can also be defined as natural monopoly good where the marginal cost is equal to zero. From this perspective, given political will of the government, content and assessment can become pure public 'goods' available at no charge to the all citizens or, if provided by an international organisation, such as the United Nations, become available to the entire humankind as global goods. Not necessarily these two services must be provided by the government as there are numerous private funds with sufficient financial capacity to create a virtual university and provide free access to the facilities to all. However, this initiative requires full support of the government accreditation of such an institution, which is not always possible due to political considerations. It should be noted that the facilities of this

virtual university do not include examinations with an exception for informal practice tests for self-assessment, teaching with an exception for pre-recorded lectures and tutorials in a variety of formats, and certification.

Teaching, formal examination and certification must be provided for a fee that will reflect the value of obtaining a quality instructional service. Therefore, academic administration and teaching will remain private goods with significant positive externalities, which might justify subsidies or, better, higher education loan schemes for certain socio-economic groups, especially in teaching where duration of the process and, therefore, costs might be significantly higher than in academic administration. With this 'private' approach to teaching and administration students can choose the number and kind of classes they need to attend for achieving the desired result instead of, - as it is common in modern higher education, - paying for a fixed set of lectures they do not necessarily need.

4. POLICY IMPLICATIONS

From the discussion in Sections 2 and 3, it is possible to conclude that the reform of higher education cannot be left to the economic agents in presence of market failure. To achieve the full potential of aggregate knowledge, the sector needs a single content development institution for administering contributions from individual specialists and instructors. Access to on-line lectures and tutorials can be provided free of charge with the fixed cost of establishing such a facility met by the government. Given zero marginal cost of an extra student accessing teaching material, this operational function is a natural public good.

A large constantly updated test bank with sets of practice and actual exam and test questions with random inputs will ensure the highest possible quality of educational output as well as the lowest possible cost of assessment services provided. The practice formative tests from the test bank can be accessed by the students within on-line teaching material, while access to the real exam questions must be restricted to the academic administrators and only immediately before the exams start. Practice tests can become another natural public good provided for free, while real test become a private good with the costs paid by the students at the time of making a booking for the examination.

For the sake of quality control, the government must restrict the market for academic administration to a small number of relatively large firms. Academic administration services are a private good with the costs covered by individual students. Given a short duration of examination and marking, the examination fees will be only a fraction of the currently paid tuition fees, which would allow students earn for this service with no government involvement. Academic administration can be purely private good and, given low costs of services provided and very low barriers for accessing this service, can result in a higher efficiency on this market.

Teaching will always remain a private good with positive spill-over effects. Deregulation and competition in teaching will help to achiever quality and efficiency by removing duplication in teaching and learning and financially rewarding instructors who are able to deliver the results, while separation of teaching from all other academic functions will ensure quality output and integrity of the final grades. Nevertheless, the costs of teaching services might be substantial despite high level of competition in this area due to the large costs of obtaining a qualification and gaining teaching experience. Therefore, student loans are possible to address the issue of positive externalities in education.

Multiple market failures in higher education warrants the government intervention in this sector and might take a mild form of a legislation that prescribes all students studying for any of the nationally accredited academic awards to sit the final exams in a special exam centre and a legislation that would establish an institution responsible for facilitating development of teaching materials and building test banks. This would trigger mergers of some of the existing institutions and disappearance of others from the market. Low costs and high quality of education will stimulate lifelong learning, which in turn will bring the knowledge depreciation associated with non-using it for productive purposes to a minimum.

5. CONCLUSION

This study looks at the composition of knowledge and higher education from the economic perspective. The author identifies the knowledge base as a public good, while the stock of aggregate knowledge, being a component of the aggregate human capital, as a private good with significant positive externalities. It is suggested that the economic objective of the society must be maximising the aggregate knowledge and not the knowledge base. This consideration calls for a need of further theoretical and applied research on measuring this variable and using it as an input in modelling for policy impact and productivity analysis.

Critical evaluation of the operational functions of an individual educational institution suggests that content and assessment have a potential of becoming public or even global goods subject to the political will. The discussion allows identifying the areas of government intervention into the higher education market. The study suggests exploiting economics of scale in content and assessment by launching a single virtual university equipped with all teaching materials and practice tests. Deregulation of academic administration and teaching services would result in increase in competition in these markets and a better allocation of resources, as the result. The suggested separation of operational functions of academic institutions allows significantly reducing the pressure on the budget and, at the same time, address the quality issues that universities failed to address for several decades.

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