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COMPARATIVE INTERNATIONAL ISSUES IN POLICY-OUTCOME RELATIONSHIPS

VOLUME ONE

Béatrice Boufoy-Bastick

ACHIEVEMENT WITH FAMILY & COMMUNITY INVOLVEMENT

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CHAPTER 21

THE HIGHER EDUCATION PREMIUM AS A MEASURE OF REGIONAL DEVELOPMENT

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Abstract

Until the 1990s, studying the impacts of Higher Education Institutions (HEI) mostly focused on short-term impacts, i.e. the economic approach. In recent years, there has been a growing interest on the long-term impacts of higher education, especially concerning human capital.

The human capital analysis (Schultz, 1961; Becker, 1993) estimates the increase in productivity and incomes for individuals due to the knowledge and skills they acquired from attending a HEI. Following these authors, Bluestone (1993) suggested that the creation of human capital for higher education graduates can be estimated by assuming that wages are correlated only with the number of official school years.

In this paper, the human capital of a higher education graduate, in a deprived region of Northeast Portugal has been determined considering that the education premium is due solely to the number of years in higher education.

It was also possible to determine that the direct stakeholders, namely the government and the students, have different values and attitudes towards the higher education premium.

Keywords

Economic impact – Higher Education Institution – Human capital - Stakeholders

Introduction

Until the 1990s, studying the impacts of Higher Education Institutions (HEI) mostly focused on short term impacts, i.e. the economic approach. In recent years, there has been a growing interest on the long term impacts of Higher Education (HE), especially in what regards determining the creation of human capital.

Although several authors (e.g. Altinok, 2007; Becker, 1983; Desjardins, 2003) recognized the existence and creation of human capital on individuals that invest in a higher education, they also recognized that this impact is very difficult to quantify. Usually, whenever long term impacts were analysed, only the identification of those impacts was made and no quantification was attempted.

Following the econometric equation developed by Mincer (1958), establishing a relationship between wage variations and various factors, such as the number of official school years, family background and personal skills, other authors (e.g. Becker, 1993) have presented ways to determine this impact. Bluestone (1993) presented a more straightforward method,

suggesting that one can establish the value of human capital for the HE graduates assuming that the higher wages are correlated solely with the number of official school years. This is a simplified way to determine human capital, through its more visible form, called education premium.

In this study we determined the human capital of individuals that graduated from a Portuguese HEI, considering that the education premium (the increased wage when compared with the graduates of secondary education) is due only to the number of years they attended the institution. With this assumption, and following Bluestone´s model, it was possible to determine the education premium of students that decide to obtain a higher education degree and remain in a certain region.

To deepen the analysis the stakeholders involved were also considered (Freeman & Reed, 1983: 91). Although, different stakeholders have different considerations, values or attitudes, we also distinguished between direct and indirect stakeholders. The direct stakeholders are the graduates and the government; and the indirect stakeholders are the communities where the graduates will live as well as their parents (Dick, 1997).

Therefore, first a brief review of the literature on human capital is presented; then Bluestone's model is revisited and, finally, the case of a Portuguese higher education institution is described.

1. Human Capital

The human capital theory is a concept that appeared in the 18th Century, with the basic premise that the people that constitute a given society are a form of capital in which the society can invest in the same way as they invest in physical capital (Williams & Swail,

2005). This theory was greatly developed in the 1960s by Schultz (1961) and Becker (1993).

The human capital analysis intends to determine the higher education institutions' impact under the supply-side. It calculates the increase in productivity and income for individuals due to the acquired competences, knowledge and skills from attending a HEI. Becker (1993) defined human capital as the economic effects upon jobs and income due to the investment made in education and training.

The human capital theory is concerned with the effects of education upon the overall economy, and, in particular, upon individuals' earnings. Its major constrain is the implicit assumption that education has a similar effect upon all individuals just as the money factor does. The main principle is that education increases efficiency and, as such, the lifelong incomes (Nakabashi & Figueiredo, 2008). This theory sustains that there is a correlation between human capital and economic growth, i.e. higher levels of education can bring higher earnings (Altinok, 2007; Becker, 1983; Desjardins, 2003, Monks, 2000; Perna, 2003; Sudmant, 2002). Becker (1993: 12) reinforces that "probably the most impressive piece of evidence is that more highly educated and skilled persons almost always tend to earn more than others".

Through the use of income functions, developed from Mincer's equation, there has been an attempt to determine the relationship between education and earnings, and the educations' return rate (Becker, 1993). These earnings are a measurement of the increased efficiency of the individual and, as such, of its contribution towards economic development (Williams & Swail, 2005; Strayhorn, 2005).

Although the existence of benefits from investing in human capital is largely recognized, it is still very

difficult to accurately determine the results that arise from such investment. It is possible to have an idea of the dimension of that impact by estimating the increase in regional earnings that result from higher education (Sudmant, 2002; Williams & Swail, 2005). Theoretically, earnings are determined by the individual's productivity and it is expected that differences in productivity are due to personal differences in educational investments. As such, it is expected that additional school years increase labour productivity (Jefferson College, 2003; Perna, 2003).

In terms of measurement, the average school years of the labour force has been used as a good proxy for human capital. Formal education is, from all forms of education, the one that has the strongest relative influence in the economic results (Becker, 1993; Desjardins, 2003).

Education as an investment is analysed through the relation between benefits and costs, being this relation the concept of return on investment – ROI (Clarck et al., 1998). Even though the cost of studying at a higher education level is high, the return on that investment is expected to be high enough to offset that cost (Bryant, 2001). However, those benefits can take years to actually happen after graduation. That time period is often difficult to determine and most of the studies assume that students find a job immediately after graduation, which is not supported by the data provided by the Portuguese National Statistics Institute.

The economic value of higher education is reflected on the education premium obtained by workers with a higher degree (Arizona State University, 2003). The education premium is understood as the earning differential that a graduate from a HEI earns above the earnings of a Secondary Education (SE) graduate.

Also, individuals with higher educational levels can obtain jobs faster and, as such, have more and better job experiences, have higher job stability, have more capabilities and knowledge to apply in a labour environment, are more productive and have higher wages (Bryant, 2001; Clarck et al., 1998; Thomas & Zhang, 2004).

Blackwell et al. (2002) argue that there is a shortage of data when one tries to estimate human capital, according to higher lifelong returns, specifically because they do not incorporate the innate differences of capabilities or skills that individuals have. In fact, it is likely that not all earnings associated to a higher education degree are due to education itself, but also to the innate capabilities of students (Becker, 1993; Lindahl & Regnér, 2002). However, there are still no developments in this area, and, as long as there is no evidence on which acquired skills or competences make the difference, the number of school years is still a good proxy. Therefore, a way to determine the human capital value in the market is by correlating the individuals' incomes with their level of knowledge and number of school years.

1.1 The Bluestone Model

Bluestone (1993) is referred to as the pioneer on studies about HEI's long term impacts, or supply-side impacts, in regions in which the human capital has a great importance. Bluestone's model was first developed and applied in the Boston region to estimate the impact of the Massachusetts University.

This study analysed the institution's impact according to three economic contributions to the region where it is located: "(1) the additional income that UMass/Boston students generate within the state as a result of their university education (2) the added state income and sales taxes revenues generated for the

state government as a result of the additional income earned by these students, and (3) the "export base" income and tax revenues generated from non-resident tuition, fees, and living expenses; gifts and unrestricted funds from non-Massachusetts sources; student federal grants-in-aid; non-Massachusetts sponsored grants and contracts; and federal endowment income (Bluestone, 1993: 3)."

Bluestone estimated future potential earnings of the higher education graduates that remain working in the region as a measurement of the long term economic impact of higher education.

Although there are some criticisms to Bluestone's model (such as, that it does not control the innate capabilities that workers have; that it cannot determine if a worker earns more because he has a certain level of education or simply because he is intrinsically a better worker; and also because it is necessary to guarantee that the graduates remain in the region) none of the more recent models incorporated the differences associated with individual capabilities.

The main innovation of this approach was the attempt to estimate not just the total value of the institution but the enhanced regional economic activity as a result of the educational institution's activities. Bluestone was able to estimate the human capital creation by using the wage differential as a proxy. It also determines the impact upon government revenues by comparing the amount spent by the government in financing the institutions and the amount received in the form of taxes paid, as a result of the additional income of the graduates from that HEI. If graduates earn more they will also spend more and, as such, the regions will benefit from a higher level of business activity, also benefiting the

government as it will receive more taxes (on income or sales). Bluestone (1993) determined if the government's investment in higher education has a satisfactory rate of return, by analysing the government's spending and the government's revenues in the form of taxes over income and sales.

Following the sequel, Bluestone's model is developed in two separate parts. The first concerning the students' ROI; and the second the ROI of the government.

1.1.1 Return On Investment (ROI) in the graduates' perspective

Theoretically, the rational individual compares the future earnings of his educational investment and chooses the educational program that will maximize the return of the investment (Becker, 1993).

This perspective, followed by other authors (e.g. Perna, 2003; Rubi, 1995; Strayhorn, 2005; Thomas & Zhang, 2004), estimates the difference in present value of the lifelong earnings between a higher education graduate and individuals with different educational levels. Usually the comparison is made between higher education and secondary education graduates. To accurately estimate the value, it is necessary to consider the opportunity cost that a graduate must endure during his degree, by not earning any income, and the cost of studying, such as tuitions, books, and other costs.

1.1.2 Return On Investment (ROI) in the government perspective

Bluestone's model considers another step in the determination of human capital. He considers the education premium for graduates and he also

estimates the return on investment for the government. The latter is obtained by estimating the present value of the differential in taxes received over income and sales during the working life of a HE graduate when compared with an individual with only SE. This result is then compared with the investment the government made in the higher education student throughout his degree, usually of four years, which is often determined by dividing the HEI's annual budget by the number of students. From this comparison the internal rate of return is thus obtained (Guichard & Larre, 2006; Rubi, 1995).

In the estimation of the return from taxes over income it was assumed that, if all the other conditions remain the same, those that earn more will pay more taxes (Arizona State Board of Directors for Community Colleges, 1995). In the same line of thought those that earn more will have more expenses and spend more. A simple way to estimate this is by estimating the taxes over the available income during the number of years considered.

2. The case of the Portuguese Polytechnic Institute of Bragança

According to Bluestone's model, as presented above, in order to estimate the human capital impact of an HEI in a specific region it is necessary to first establish the earning differential between HE graduates and secondary school graduates and, then, the present value of the taxes differential paid during their working life.

In order to present a clearer example of this method, a region and a HEI from the Northeast of Portugal were selected. The region was Bragança and the HEI was the Polytechnic Institute of Bragança (in Portuguese, IPB).

The value-base considered were the average wages for SE and HE degrees, in Bragança, in 2007, respectively 816.61€ and 1,214.79€, obtained from the National Statistics Institute.

2.1.1 Return On Investment (ROI) in the graduates' perspective

To determine the return on investment of HE graduates it was necessary first of all to estimate the earning premium of HE graduates. This can be done by estimating the wage differential during 40 years of labour, assuming that this differential is only due to the different educational levels. Other assumptions were made in order to allow future comparisons with other studies, such as an equal 40 year labour period and also that, in both cases, graduates will find a job as soon as they graduate, when it is known that usually there is a search period for the first job of 8 to 15 months in Portugal (table 1).

Table 1 – Present value of lifelong net income of both educational levels

	(1) Monthly wage	(2) Average monthly wage (14 months)	(3) Real update rate(am) (i)	(5) Update factor $\left[\frac{1-(1+i/12)^{-40\text{years}\times 12}}{i/12}\right]$	Present value (2x5)
HE graduate	1,214.79 €	1,417.26 €	2.0%	330	468,010 €
SE graduate	816.61 €	952.71 €	2.0%	330	314,607 €

(am) Average inflation rate of 3.0%, and a nominal interest rate of 5.0% (Data available in the Portuguese Central Bank).

Table 1 describes the lifelong earnings of both educational graduates. A HE graduate will receive, during his working life, in present value, 468,000

euros; while a SE graduate will earn 314,600 euros during the same time period.

To obtain the education premium, it is necessary to estimate the costs that a HE graduate will bear during his four years of degree, assuming that he will not fail any year (table 2). All the values were based on the case of a student attending an HEI in the North of Portugal, specifically an IPB student, according to an extended survey carried out in 2007 (Fernandes, Cunha & Oliveira, 2008).

Table 2 – Cost of a higher education degree

	(1) Monthly opportunity cost	(2) Monthly expenses (except room and board)	(3) Monthly fiscal benefit	(4) Annual cost (1+2-3)	(5) Update factor $\left[\frac{1-(1+i/12)^{-4\,years\times 12}}{i/12}\right]$	(6) Total cost in present value (4x5)
HE graduate	952.71 €	257 €	54 €	1.156 €	46	53,288 €

Table 2 shows that an individual that studies in a HEI for four years will spend, in present value, 53,288 euros. This calculation included: (a) the opportunity cost of attending a HE degree, corresponding to a secondary education wage that is lost every month; (b) the monthly expenses directly related with the attendance of the degree, such as tuitions and books. The expenses with room and board were excluded since a secondary education graduate will also have these expenses; (c) the fiscal benefit was deducted, since Portugal has an annual tax reimbursement policy of 645 euros per student.

The education premium, or the earning differential between a HE graduate and a SE graduate, is shown on table 3.

Table 3 – Education premium of a HE graduate

	(1) Lifelong income differential (40 years)	(2) HE cost (four years)	(3) Education Premium (1-2)
HE graduate	153,400 €	53.288 €	100,100 €

Table 3 shows that the net income differential in 40 years of working life, between a HE graduate and a SE graduate, reaches 100,100 euros, when both live in Bragança. The internal rate of return for a higher education graduate that will remain in Bragança after graduation, without considering increasing differential incomes over the years, is 10.3%.

On the stakeholders' analysis, it was possible to question the students that will graduate and obtain a higher education degree about their perception on the education premium. Students do not perceive the government contribution to their degrees as important as their families' efforts.

3.2.1 Return On Investment in the government's perspective

Previously the educational premium for HE graduates was determined. It is now necessary to determine the taxes over the additional income in order to estimate the return on investment on the government's perspective. This can be done by comparing the amount that the government spent with each student's graduation and the taxes it will receive during the graduates working life.

The application of Bluestone's vision implies that a student will take four years to graduate and will never fail any year, as such the government will bear only four years of higher education.

The income taxes paid by a HE graduate and by a SE graduate are shown in table 4.

Table 4 – Taxes paid by higher education and secondary education graduates

	(1) Average monthly Income (14 month)	(2) Tax rate	(3) Monthly tax (1x2)	(5) Update factor $\left[\frac{1-(1+i/12)^{-40\text{years}\times 12}}{i/12}\right]$	(6) Taxes paid (3x5)
HE graduate	1.417,26 €	18.49%	262 €	330	86,516 €
SE graduate	952,71 €	16.04%	153 €	330	50,466 €

As can be observed in table 4, for 40 years of work, a HE graduate will pay 86,500 euros in income taxes at present value (at a tax rate of 18.48%); while a SE graduate will pay almost 50,500 euros (at a tax rate of 16.04%). The differential tax paid is, in present value terms, 36,050 euros.

Table 5 shows a summary of earnings; taxes paid, and net income of a HE graduate and a SE graduate.

Table 5 – Earnings and taxes paid during 40 years of working life

	Lifelong income	Taxes paid	Net income
HE graduate	468,010 €	86,516 €	381,500 €
SE graduate	314,607 €	50,466 €	264,140 €

The figures show that a HE graduate will receive 468,000 euros during his working life, which corresponds to 153,000 euros more than a SE graduate. However, after taxes, the income net value is 117,350 euros.

Since the government spends, during the four years of graduation 13,600 euros per student, this means that the government has a return on its investment of

21,000 euros (table 6). In fact, the government's rate of return reaches 9.4%, which is considerably high for a public investment.

Table 6 – Return on investment

	(1) Tax paid	(2) Tax differential	(3) Cost per student	(4) Government's return (2-3)
HE graduate	86,516 €	36,050€	13.600 €	22,450 €

Although the analysis supports that the budget granted to the HEI is an investment, due to the return rate, the government sustains that the budget is a cost it has to bear every year.

Conclusion

In the analysis of the economic impact on the supply-side, the human capital created due to the higher education obtained by Portuguese students, was estimated.

Following Bluestone's model, it was possible to determine that the government recovers its investment during the active life of a HE graduate. In fact, the government will receive an additional income tax of 36,000 euros per HE graduate, and achieve an internal rate of return of 9.4% on its investment in education.

On the other hand, a HE graduate from the IPB can expect an education premium of 100,100 euros (64,000 euros after taxes) during his working life, when compared with a SE graduate.

The numbers of students that graduate from the IPB and remain in the region of Bragança every year must also be considered. In 2007 this number reached 462 graduates. It is possible to determine that the

graduates from just a specific year, 2007, will pay 10.4 million euros to the government as taxes, and will benefit from an education premium of 30 million euros during their active life.

Even though human capital analysis relates a given population's higher education degree with the region's economic growth, the Portuguese government goes on with its policy of continuous reduced budgets, not considering that the constrains on educational institutions will have reflections upon graduates, due to their perception of fewer resources, lower scholarships and even higher rates of dropouts, that will restrain the level of growth of the region.

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