CHAPTER 20

THE SOCIOECONOMIC IMPACT OF A HEI FOR A LOCAL ECONOMY

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Abstract

This paper discusses the impact of Higher Education Institutions (HEIs) upon the economic development of a given region. A Portuguese Higher Education Institution - the Polytechnic Institute of Bragança (in Portuguese, IPB) – was used for that purpose as a case study. The IPB is located in the region of Bragança, an isolated and deprived region in the Northeast of Portugal.

Two approaches were followed: the demand-side approach (Caffrey & Isaacs, 1971) determines the economic impact arising from the expenditures of the IPB and its individuals; and the supply-side approach (Becker, 1993; Bluestone, 1993) measuring the creation of human capital and the enhancement in the quality of life of local individuals. Data collection included surveys on the faculty, staff, students

and graduates of the IPB; IPB's records, and other official sources. Following these two approaches, the IPB's total impact upon the region was determined, reaching 55 and 61 million euros, respectively.

The stakeholders related to the higher education institution were also taken into account. It was perceived that all stakeholders understood the importance of the institution to the region, and they were all engaged in helping to promote the region and the HEI's activities.

Keywords

Economic impact – Higher Education Institution – Human capital - Stakeholders

Introduction

Higher Education Institutions (HEIs) are institutions of great financial and social importance for the hosting regions, granting educational, economic, social and cultural opportunities that would not be there otherwise, and are thus recognized as regional development mechanisms. HEIs not only create opportunities and jobs that contribute towards the global economic activity of the region but they can also attract outside resources and investments (Carr & Roessner, 2002; Smith, 2006, Yserte & Rivera, 2010). HEIs are sources of qualified workers, with valuable competences for local employers, generating new technologies through research and development and enhancement of local quality of life through volunteer community service, among other contributions (Greenspan & Rosan, 2007).

Therefore, it is important to measure the economic impact that arises from the presence of the HEI in a given region. It estimates the additional impact that occurs above the economic activity level that would exist if the HEI would not be there. Since most of the revenues of the HEI come from outside of the region,

if the HEI did not exist, these resources would also be spent outside the local economy (Elliott et al., 1988; Jefferson College, 2003).

Yserte and Rivera (2010) argue that the impacts of HEIs in a given region can be determined through the HEI's inputs, i.e., demand-side approach, and through the HEI's outputs, i.e., supply-side approach (figure 1).

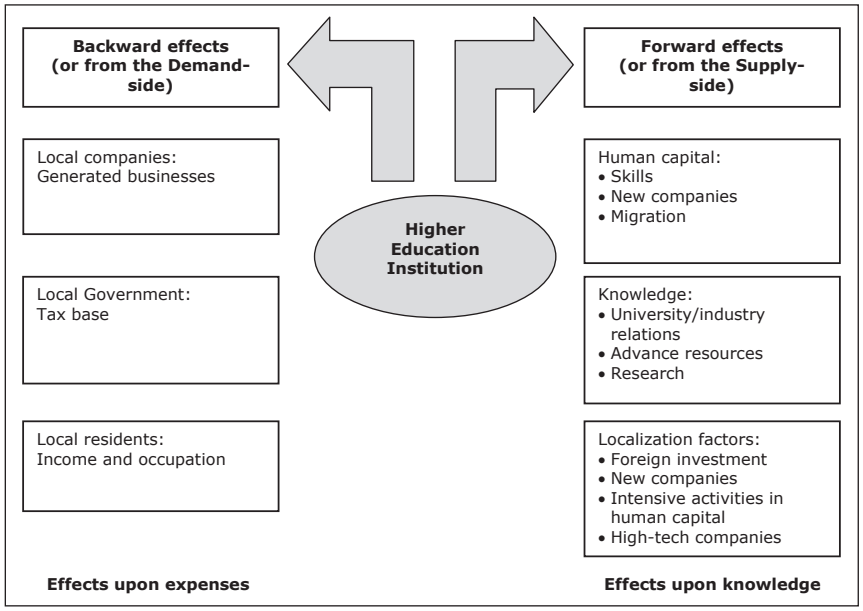

Figure 1 – The impact of Higher Education Institutions

Source: Yserte & Rivera (2010: 5).

The demand-side approach (Caffrey & Isaacs, 1971) is used to determine the impact upon local output or Gross Domestic Product (GDP) and upon jobs created which would not otherwise exist, arising from the IPB's presence and by the incomes earned and subsequently spent locally by staff and students.

The supply-side approach (Becker, 1993; Bluestone, 1993) measures the creation of human capital and the enhancement of local individuals' quality of life, through the community use of the HEI's initiatives, buildings and other facilities.

Several authors (e.g. Blackwell et al., 2002; Carr & Roessner, 2002; Lantz et al., 2002) recognize that, although usually an economic impact analysis is restricted to the demand-side, it will underestimate the real impact of the HEI in a given region.

Therefore, this paper estimates the economic impact of the Polytechnic Institute of Bragança (in Portuguese, IPB) upon the region of Bragança, a deprived region in the North of Portugal, by using both approaches. Surveys were conducted among the staff, students and graduates of the IPB, so that the total effects upon the regional GDP, upon employment, upon the enhancement of human capital and upon a range of community benefits can be estimated.

To better understand the influence of the existence of the HEI in the region it was also important to take a broader perspective and identify the different stakeholders and the relationships between them, as well as if they pursued the same goals and followed the same values and principles (Freeman, 1984).

Economic value is created by people who voluntarily come together and cooperate to improve everyone's circumstances (Freeman, Wicks & Parmar, 2004). Therefore, it is not possible to completely assess the impact upon the region without analysing how stakeholders understand the importance and the purpose of the HEI, and how the region and its individuals help and support the HEI.

The rest of the paper is organized as follows. Firstly, a brief review on the demand-side and on the supply-

side approaches is presented. Then, the analysis of the economic impact of the Polytechnic Institute of Bragança is explained. Finally, the main conclusions are drawn.

1. The demand-side approach

The demand-side approach estimates the contribution of HEIs towards local economies by measuring the effects on employment and local revenues that are created by the spending of the institution and the individuals that are directly related to it (Brown & Heaney, 1997).

Therefore, the economic impact of a given HEI results from three components: the direct, the indirect and the induced economic effects (Yserte & Rivera, 2010). The direct economic effects are the direct spending from the faculty, staff and students, and from the institution itself in the region (Elliott et al., 1988). The indirect and induced economic effects are difficult to determine and, as such, in practice a multiplier is usually applied to the direct effects in order to estimate these last two (Carr & Roessner, 2002; Elliott et al., 1988; Smith, 2006).

Most economic impact studies (e.g. Carrol & Smith, 2006; Charney & Pavlakovich-Kochi, 2003) follow the guidelines defined by the work presented in the American Council on Education (ACE) by Caffrey and Isaacs (1971). In fact, Blackwell et al. (2002) and Elliott et al. (1988) refer to this model as the base of the HEI's economic impact analysis.

1.1 The American Council on Education Model (ACE)

The ACE model estimates the impacts upon local business, local government and local individuals (figure 2). Its purpose is to identify who is spending,

how much is being spent, what goods are being bought and from where. Five sources of direct impact are considered: the institution, the faculty, the staff, the students and the visitors spending. In order to use this model, the data is mostly obtained through: surveys, the institutions' records and from other official sources.

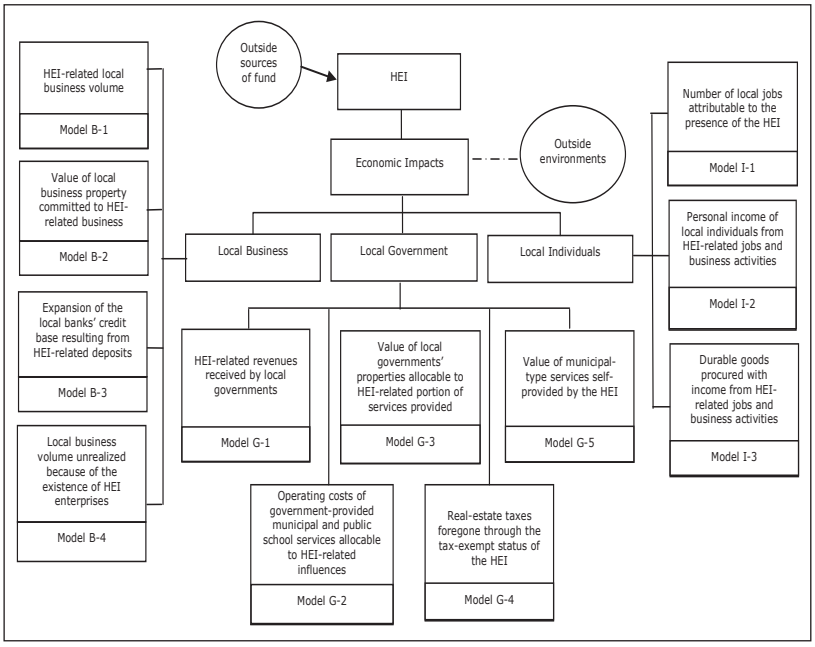

Figure 2 – The ACE Model
Source: Adapted from Caffrey & Isaacs (1971: 10).

Due to several criticisms that the model received, the main one being its complexity, some authors (e.g. Carrol & Smith, 2006; Yserte & Rivera, 2010) used only model B-1 of figure 2. Therefore, a simpler version of the ACE model is shown on figure 3.

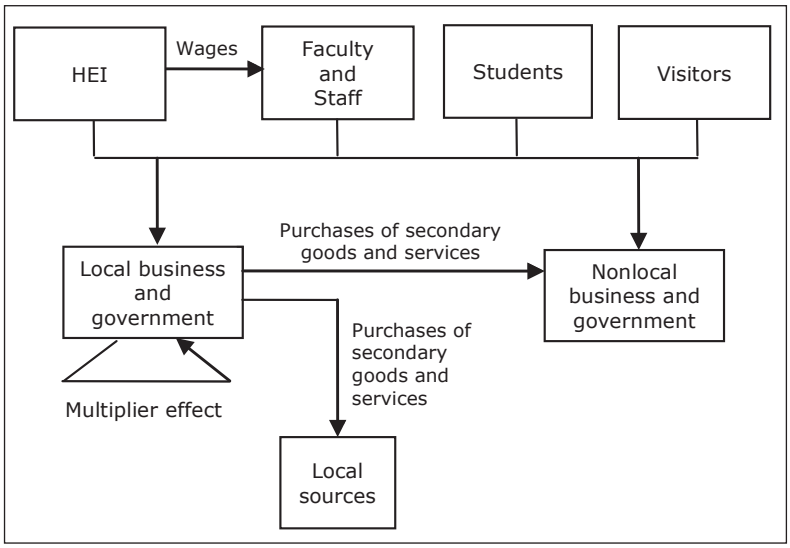

Figure 3 – The monetary flow related to the HEI that influences local business volume – Model B-1
Source: Adapted from Caffrey & Isaacs (1971: 6).

Another criticism to the ACE model is the fact that it does not estimate long-term impacts (Brown & Heaney, 1997). Although Caffrey and Isaacs (1971) recognized the existence of those impacts, they argued that it is not possible to bring together in the same model both short-term and long-term impacts, since they have different perspectives, one being from the demand-side and the other from the supply-side.

The long-term impacts can be studied and estimated according to the supply-side approach, as described in section 2 following.

2. The supply-side approach

The supply-side approach is based on the human capital concept (Schultz, 1961; Becker, 1993), which sustains that education, due to the competences and skills acquired, increases efficiency and, therefore, lifelong income. This approach estimates the higher productivity and higher earnings that HEI graduates

benefit from (Brown & Heaney, 1997; University of Colorado, 2006).

Moreover, some authors (e.g. Baum, Ma & Payea, 2010; Blackwell et al., 2002; Desjardins, 2003) also recognize the existence of qualitative benefits, such as the correlation between higher education and better health, intellectual stimulus, higher civic participation, lower criminal rates or even decreasing smoking rates.

Although, none of these effects can be easily quantified in monetary terms, they all contribute towards the growth and economic activity of a given region. The problem with supply-side models is not so much related to the identification of the effects or their influence, but rather how to quantify them.

Therefore, although the estimates on the returns on education that focus only on wage increases are limited and most probably underestimate global returns, it is one of the more objective measures (Smith, 2006). In fact, in terms of measurement, formal school years have the strongest relative influence on economic results of the labour force and have been used as a good proxy for human capital (Becker, 1993; Desjardins, 2003).

Bluestone (1993) considered that the demand-side approach was very limited since there is an increase in skills, from attending higher education, which generates more qualified workers that earn more than they would earn had they not graduated and, as such, pay more taxes.

This method also received some criticism, because some HEIs can be tempted to use this approach to present higher economic results and, therefore, it must be conducted with caution (Carrol & Smith, 2006). Thus, to prevent inflated estimates, both

approaches are presented separately and conservative assumptions were always chosen.

2.1. The Bluestone Model

Bluestone (1993) presented a method that completes the demand-side approach, including the long-term effects arising from a more educated population.

This model attempts to estimate the regional economic activity enhancement, based on the assumption that if graduates earn more, they will also spend more and, as such, the regions will benefit from a higher business activity. On the other hand, the government will also benefit as it will receive more taxes (on income or sales). Bluestone was able to estimate the return on investment (ROI) for graduates that remain in the region and also for the government.

To determine the graduates' ROI, Bluestone estimates the difference in present value of lifelong earnings between higher education (HE) and secondary education (SE) graduates. The opportunity cost that HE graduates must bear throughout their studies (while not earning any income), as well as the costs of studying (such as tuitions, books, and others) should be included, to accurately estimate the ROI.

The government's ROI is obtained by comparing the investment the government made in the student's higher education degree, with the lifelong income and sales taxes differential between HE and SE graduates (Guichard & Larre, 2006).

3. The case of a Portuguese higher education institution

The region under study includes two towns, Bragança and Mirandela, located in the far northeast of Portugal, in a deprived and isolated area, near the border with Spain.

These towns are located in the Alto de Trás-os-Montes, with a population of 216,245 inhabitants, in 2007. Bragança has 34,489 inhabitants (the urban area has 20,309 inhabitants), geographically occupying an area of 199 km2, with a purchasing power index of 100.99 (the national average index is 100.00); whereas Mirandela has 25,559 inhabitants (the urban area has 10,780 inhabitants), geographically occupying an area of 149 km2, with a purchasing power index of 73.88.

The IPB has 396 faculty and 233 staff members. Its annual budget is over 20 million euros. The growth of the IPB over the years can be assessed by the increase in the number of students enrolled. It started with 110 students in the academic year of 1986/87 and reached 6,120 students in 2007/08.

3.1. The demand-side analysis

The data required to apply the ACE model was obtained from surveys to faculty, staff, students and graduates from the IPB, plus from official records. The results reflect the answers obtained from 166 responses from the faculty (42%), 105 from the staff (44%), 1343 from the students (26%) and 126 from the last 20 years' graduates (1.5%) (Fernandes, Cunha & Oliveira, 2008). The data are summarized in table 1.

Table 1 – IPB's economic impact, according to the ACE model

Impact upon Local business	
B-1: HEI-related local business volume	54,948,182 €
B-2: Value of local business property committed to HEI-related business	3,736,476 €
B-3: Expansion of the local banks' credit base resulting from HEI-related deposits	5,779,045 €
B-4: Local business volume unrealized because of the existence of HEI enterprises	0,0 €
Impact upon the local government	
G-1: HEI-related revenues received by local governments	241,390 €
G-2: Operating costs of government-provided municipal and public school services allocable to HEI-related influences	1,931,540 €
G-3: Value of local governments' properties allocable to HEI-related portion of services provided	Not available
G-4: Real-estate taxes foregone through the tax-exempt status of the HEI	29,340 €
G-5: Value of municipal-type services self-provided by the HEI	294,760 €
Impact upon local individuals	
I-1: Number of local jobs attributable to the presence of the HEI	2,393
I-2: Personal income of local individuals from HEI-related jobs and business activities	30,636,970 €
I-3: Durable goods procured with income from HEI-related jobs and business activities	1,263,470 €

The IPB's impact over local business reached 54.9 million euros; over local business property was 3.7 million euros, and the expansion of local bank's credit base was 5.8 million euros.

The IPB's impact upon local government, represented by the revenues the government received related to the IPB, was 241 thousand euros. Local government also had to bear certain costs due to the presence of this public HEI in the region: in operating costs, over 2.0 million euros and close to 30 thousand euros were not collected due to IPB's tax exemption. Model G-3 could not be estimated since it was not appropriate for the Portuguese reality.

The impact of the IPB upon local individuals was estimated in almost 2,400 jobs created. The individuals earned 30.6 million euros due to activities related to the IPB and 1.3 million euros of durable goods were acquired with such income.

Overall, the economic impact estimated on the demand-side approach was, approximately 62.0 million euros. This amount represents 9.8% of the regional GDP. The number of jobs created is 7.5% of the local active population.

3.2. The supply-side analysis

The supply-side analysis begins by determining the differential in terms of earnings between HE and SE graduates and the differential in terms of taxes paid during their working life, both in present value terms. The value-base considered was the average wages in Bragança, for the year 2007, obtained through the National Institute of Statistics (table 2).

The return on investment of HE graduates was estimated by comparing the wage differential during 40 years of work, assuming that this difference is only due to different educational levels; and the cost that HE graduates have to bear during the four years degree, assuming that they will not fail any year. The cost a student will bear for attending the IPB was obtained from a survey conducted in 2007 (Fernandes, Cunha & Oliveira, 2008). Table 2 describes the results, namely the income differential through the working life, the cost of completing a HE degree and the earning differential for HE graduates, as well as the ROI.

Table 2 – Present value of lifelong net income of both educational levels

	Monthly wage[(a)]	Lifelong income (in present value)	Degree cost (in present value)	Net earnings	ROI
HE graduate	1,214.79 €	468,010 €	53,288 €	100,100 €	10.3%
SE graduate	816.61 €	314,607 €	0 €		--

(a) Available at INE (2008).

Table 2 shows that an IPB graduate will earn 153,400 € more during his working life than a SE graduate. The amount an IPB graduate spends to complete his studies was determined by considering: (a) the opportunity cost of attending the HE degree that corresponds to the loss of a SE wage every month; (b) the monthly expenses directly related to the degree, such as tuitions and books; (c) the deduction of fiscal benefits that HE graduates benefit from. The net differential between HE and SE graduates reaches 100,100 euros in 40 years of work, corresponding to an internal rate of return of 10,3%.

The return on investment for the government was determined by comparing the amount the government spent during the four years degree and the taxes it will receive during the graduates 40 years of working life.

Table 3 – Earnings and taxes paid during 40 years of working life

	Lifelong Income	Taxes paid	Tax differential	Cost per student	Government's return (2-3)	ROI
HE graduate	468,010 €	86,516 €	36,050€	13,600 €	22,450 €	9.4%
SE graduate	314,607 €	50,466 €				

Table 3 presents the lifelong income of HE and SE graduates and also the taxes both will pay. It can be seen that SE graduates will pay 36,050 euros less during their working lives. The analysis of the government's investment relates only to the tax differential. Since HE students will cost the government 13,600 euros, the government will have a net revenue of 22,450 euros. This corresponds to an internal rate of return of 9.4%.

In total, from the student's perspective, the graduates from the IPB that will remain in the region have a direct impact of 30.5 million euros (considering the 462 graduates from 2007 that will remain in Bragança according to Fernandes, Cunha & Oliveira, 2008). According to the Portuguese Central Bank, 50% of the national GDP is based on salaries and compensations, so assuming that same proportion for Portuguese municipalities, the GDP generated by the existence of the IPB reaches 61.0 million euros. This amount represents 9.7% of the regional GDP. From the government's perspective, during 40 years of work, those graduates will pay 10.4 million euros as taxes, in the region of Bragança.

3.3. The stakeholder analysis

In this study, the broad definition of stakeholder was followed, as presented by Freeman and Reed (1983). The stakeholders that were considered were: students and their families, faculty members, school staff, the institution's administration, the local community, and the local government.

The IPB presents itself as an institution concerned with the region where it is located and with the well-being of the community. Its main aim is to create qualified professionals, endowed with ethic values and high skills. It also sustains a social responsibility with the community it serves, namely by assuming that the

facilities must be available and accessible to local residents to help them launch their businesses or help them in their business activities; as well as a high concern with the population it serves by providing services (most of them for free) to enhance their health and quality of life, usually through actions implemented within the courses that are taught at the IPB. Finally, the IPB administration is also concerned with the quality of education and, for that matter, with engaging qualified staff and faculty members. Furthermore, the IPB assumes that relations with the community should be reinforced through students, staff and faculty.

Regarding the objectives and purposes of the IPB, it was perceived that they are directly influenced by the students' enrolment which in turn affects the IPB and also the faculty and staff.

During the study, it was also evident that the purposes of the IPB were aligned with those of the local government. In fact, the objective is to attract new students to the region and, perhaps even more important, to retain the highest number of graduates in the region. They all realized that local economic results were highly dependent on the existence of the IPB. Both parties argued that the high quality service provided by the IPB must be maintained; that the number of partnerships between the institution and the local government and companies must be increased; and also that the support from the local government to the institution must be maintained.

In a different perspective, it was possible to feel a lack of satisfaction from the student's side, towards the local community. They argue that the community only looks at them as the next "rent money" and do not really support their activities. On the other hand, the community feels that the students do not have a long

term perspective and, therefore, do not care about the town since they are not local, and the majority tend to go back home after graduation. As a way to reverse this behaviour, the local government provides support to students and to all of their academic activities, seeing them as part of the community and, thus, creating in them a sense of belonging.

Conclusion

Currently, it is recognized that public HEIs are not only learning, research and innovation centres, but also important development and economic growth mechanisms, being critical for the regions' future success (Charney and Pavlakovich-Kochi, 2003; Lantz et al., 2002). These institutions generate important economic benefits: for the region where they are located, through the income and jobs they create; for individuals, through higher lifelong incomes and other benefits; and for the government, through higher tax revenues.

To determine the IPB's economic impact upon the surrounding region, both the demand-side and the supply-side approaches were followed.

From the analysis undertaken, it is possible to sustain that the IPB has a major impact upon the region of Bragança. On the demand-side approach, a total economic impact of 62.0 million euros was obtained, which lead to the creation of 2,400 jobs. This approach also helped to estimate the cost the region has with the presence of the IPB, reaching 2 million euros. However, in the overall perspective, the economic activity generated by the presence of IPB represents 9.8% of the Bragança regional GDP.

Furthermore, according to the supply-side approach, the individuals that remain in the region will generate 61.0 million euros of economic activity, corresponding

to 9.7% of regional GDP and will pay back to the government 10.4 million euros, in the form of taxes.

Overall, it was possible to verify that IPB´s stakeholders have the same purposes and pursue the same objectives, supporting the institution's activities and goals. These values are not conflicting and, in the stakeholders' perspective, are the only way forward to maintain and develop the region, both economically and demographically.

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