

## THE HIGHER EDUCATION AS A KEY FACTOR OF COMMUNITY SOCIO-ECONOMIC VITALITY: ASSUMPTIONS AND EVIDENCES

*Sandra Saúde\**, *Sandra Lopes\*\**  
*Carlos Borralho\*\*\**, *Isidro Féria\*\*\*\**

### ABSTRACT

From the analysis of six cases - four higher education institutions (HEIs) from Portugal (Universities of Porto, Évora and Algarve; Polytechnic Institute of Beja) and two HEIs from Spain (Universities of Alcalá de Henares and Lleida) - that applied equal or comparable methods of estimation of socioeconomic impacts, we will reflect on the role that Education, in general, and, particularly, Higher Education (HE) has as the mainstay of societal dynamics, particularly in areas of low socioeconomic density. The investment in HE has a multiplier effect and is a key factor for socio-economic vitality of the communities.

**Keywords:** Education. Higher education. Societal impacts. Socioeconomic dynamics.

### *O ENSINO SUPERIOR COMO UM FATOR-CHAVE DA VITALIDADE SOCIOECONÓMICA DOS TERRITÓRIOS: PRESSUPOSTOS E EVIDÊNCIAS*

### RESUMO

*A partir da análise de seis (6) casos - quatro (4) Instituições de Ensino Superior (IES) de Portugal (Universidades do Porto, Évora e Algarve, Instituto Politécnico de Beja) e duas (2) IES de Espanha (Universidades de Alcalá de Henares e Lleida) - que aplicaram métodos iguais e comparáveis de estimação dos impactos socioeconómicos que geram, refletiremos sobre o papel fundamental que a Educação, em geral, e o Ensino Superior (ES), em particular, desempenham nas dinâmicas sociais comuni-*

\* Professora Adjunta do Instituto Politécnico de Beja (Departamento de Educação, Ciências Sociais e do Comportamento) e CICS. NOVA, Beja (Portugal). ORCID: 0000-0003-0935-1133. Correio eletrónico: ssaude@ipbeja.pt

\*\* Professora Adjunta do Instituto Politécnico de Beja (Departamento de Educação, Ciências Sociais e do Comportamento) e CICS. NOVA, Beja (Portugal). ORCID: 0000-0002-8283-3908. Correio eletrónico: slopes@ipbeja.pt

\*\*\* Professor Adjunto convidado do Instituto Politécnico de Beja (Departamento de Ciências Empresariais), Beja (Portugal). ORCID: 0000-0003-3868-9715. Correio eletrónico: cborralho@ipbeja.pt

\*\*\*\* Professor Adjunto do Instituto Politécnico de Beja (Departamento de Ciências Empresariais), Beja (Portugal). ORCID: 0000-0001-6104-3141. Correio eletrónico: iferia@ipbeja.pt

*tárias, particularmente nos territórios com baixa densidade socioeconómica. O investimento em ES tem um importante efeito multiplicador e é crucial para a vitalidade socioeconómica das comunidades.*

**Palavras-chave:** *Educação. Ensino superior. Impactes sociais. Dinâmica socioeconómica.*

## LA ENSEÑANZA SUPERIOR COMO UN FACTOR CLAVE DE LA VITALIDAD SOCIOECONÓMICA DE LOS TERRITORIOS: PRESUPUESTOS Y EVIDENCIAS

### RESUMEN

*A partir del análisis de seis (6) casos: cuatro (4) Instituciones de Educación Superior (IES) de Portugal (Universidades de Oporto, Évora y Algarve; Instituto Politécnico de Beja) y dos (2) IES de España (Universidades de Alcalá de Henares y Lleida) - que aplican métodos iguales o comparables de estimación de los impactos socioeconómicos que generan, vamos a reflexionar sobre el papel que la Educación y la Educación Superior (ES), en particular, en la dinámica social e comunitaria, particularmente en territorios de baja densidad socio-económica. El investimento en ES tiene un significativo efecto multiplicador y es un factor clave para la vitalidad socioeconómica de las comunidades.*

**Palabras clave:** *Educación. Educación superior. Impactos sociales. Dinámica socioeconómica.*

### 1 INTRODUCTION

The debate about the role of higher education institution (HEI) in society is often characterized by misunderstanding, over simplifications and/or an absence of evidence. It has often been limited to arguments about the market or close to market activities of higher education institutions; with a particular emphasis on research and teaching that has a direct relevance to business and industry and is relatively easy to measure. This skews the argument, undermining the huge value of the total social benefits the sector brings.

This paper focuses on the socioeconomic effects that the presence of a Higher Education Institution (HEI) has in a territory, mainly related with the rejuvenation of the population through the attraction, each new academic year, of new young students and, afterwards, at the end of the training period by the fixation of new permanent residents. To the effect on the population dynamics it must be added economic and cultural effects as well, which transform the territorial DNA. The impact of an HEI clearly exceeds the effect inherent to the presence and daily action of an academic community comprising students, teaching and non-teaching staff, and researchers, among others. The activity of an HEI transforms the social biorhythm, the cultural DNA, and the economic pulsation of a territory. It induces value!

There are a number of channels through which HEIs may affect growth including skill supply, innovation, democracy and demand. Firstly, and most obviously, HEIs are producers of human capital; and skilled workers tend to be more productive than unskilled workers. The empirical macro literature has generally found that at the country level, human capital (typically measured by years of schooling) is important for development and growth. Growth accounting and development accounting relate educational attainment to economic performance and find key role (CASELLI, 2016; VALERO; VAN REENEN, 2016). At the sub-national level, Gennaioli *et al.* (2013) show that regional years of schooling is important for regional GDP per capita in the cross section and Gennaioli *et al.* (2014) confirm this for growth. Furthermore, human capital appears to also have an indirect effect via externalities which are analysed *inter alia* by Gennaioli *et al.* (2013) using international data (where regional human capital is found to raise firm level productivity, over and above firm level human capital) and Moretti (2004) in the US (where city level human capital is found to raise individual wages).

A second channel through which HEIs may affect growth is innovation. This effect may be direct as HEI researchers themselves produce innovations, or via universities' role as human capital producers. Different studies have found that universities increase local innovative capacity (HAUSMAN, 2012; TOIVANEN; VÄÄNÄNEN, 2014).

Third, HEIs can contribute to the development of economic or democratic institutions which may matter for growth. HEIs could promote strong institutions directly by providing a platform for democratic dialogue and sharing of ideas, through events, publications, or reports to policy makers. A more obvious channel would be that universities strengthen institutions via their role as human capital producers.

Several are the studies that argue that human capital is the basic source of growth, and the driver of democracy and improved institutions (e.g. GLAESER *et al.*, 2004). The qualification of human resources is seen as crucial to leverage the human, technological and entrepreneurial potential of a region. In this scope "[...] higher education are not only recognized as institutions that offer education and applied research but also as key players in the regional/local development." (GARRIDO-YSERTE; GALLO-RIVERA, 2010, p. 39). Quantifying the impact of an HEI makes it possible to find answers to questions related to the degree of influence and importance it may have within the socioeconomic dynamics of its territory.

In this paper, and supported by the results of 6 (six) study cases, we try to demonstrate and highlight, with measurable data, the vital strategic role that HEIs play in the economic and social survival of territories, particularly low-density rural ones. The combination of six cases results from a challenge assumed by a research team of the Polytechnic Institute of Beja (also the authors of this paper) in developing a comparative analysis of studies that quantified, for each HEI selected, its socioeconomic impact in the regional/local economy. By selecting the six case studies, we tried to gather objects that could illustrate distinct social and geographical realities: the case of HEIs located in low density regions (in population as well as in socioeconomic terms) and, others, located in more populous municipalities/regions and with greater economic dynamism.

Additionally, the analysed HEIs have different organizational profiles: the Universities of Algarve, Porto, Évora, Alcalá de Henares and Lleida belong to the

university system and the Polytechnic Institute of Beja, to the polytechnic system existing in Portugal. Despite the obvious social, economic, historical, and cultural differences (particularly from two different countries), the combined analysis of the data corroborates consistently the thesis that the investment in education has structural impact in the socioeconomic dynamics of communities.

## 2 THE SOCIOECONOMIC IMPACT OF HEIS: MODELS AND TYPES OF STUDIES

In Portugal, only very recently have the studies on the socioeconomic impact of HEIs gained some significance, unlike what happens in the USA, where such studies have been conducted since the 1960s, and even in the rest of Europe, where the impact of HEIs has been studied since the late 1990s, mainly in the United Kingdom, France, Austria, and Spain.

The history of socioeconomic impact studies reveals two different yet complementary stages, in what methodological approaches are concerned. In a first stage, particularly between the 1970s and the 1990s, predominated studies based on models that determine the demand-side impact and the dynamics generated by expenditure. Among these, you can find the so-called ACE<sup>1</sup> model, developed by Caffrey and Isaacs (1971).

From the 1990s onwards, and complementary to this demand-side approach, many other studies and models have been introduced, now focusing on the assessment of the impact caused by the outputs produced by HEIs, that is, on supply-side impact analysis. Within this framework, these studies analyse the impact of HEIs resulting not only from the education provided and the qualification of human resources but also from applied research and innovation as well as technological transfer.

From a standpoint of combined logic in impact analysis, the approach centred on the I-O (Input-Output) model gained particular relevance. It was the most commonly applied in studies conducted in the 1990s, especially in the USA. Still within this second stage in the development of impact studies, it seems relevant to stress the greater interest in exploring and demonstrating the relationship between HEIs and regional development. Studies developed within this framework include:

- a) Zhang and Karlsson (2001): which aims to demonstrate the interdependence between knowledge, human and social capital, regional dynamics of the labor market, competitiveness, and productivity;
- b) Ehrenberg (2004): which explores and compares the diverse econometric models applied/applicable to HE result indicators such as: the return on investment rates, the dynamics and behaviour of the labour market, the behaviour of industry;
- c) Siegfried, Sanderson and McHenry (2006): which, from the analysis of major weaknesses in the economic impact studies conducted before, offers suggestions as to the procedures that must be followed when exploring the

<sup>1</sup> ACE is the acronym for the American Council of Education.

impact induced by supply, with particular emphasis on the effects related to medium and long-term impacts of the knowledge produced.

Both the studies focusing exclusively on the estimation of economic impact and those which attempt to explain the relationship between HEIs and regional development, or even the ones that seek to combine demand-side and supply-side analyses, all conclude that the impact and vital boost of HEIs on local and regional economy are undeniable. Regardless of the methodology applied, this is a consensual conclusion, common to the different theoretical schools of impact studies, whether in the USA (the pioneers and greatest supporters of such studies), or in Australia, New Zealand, and even Europe.

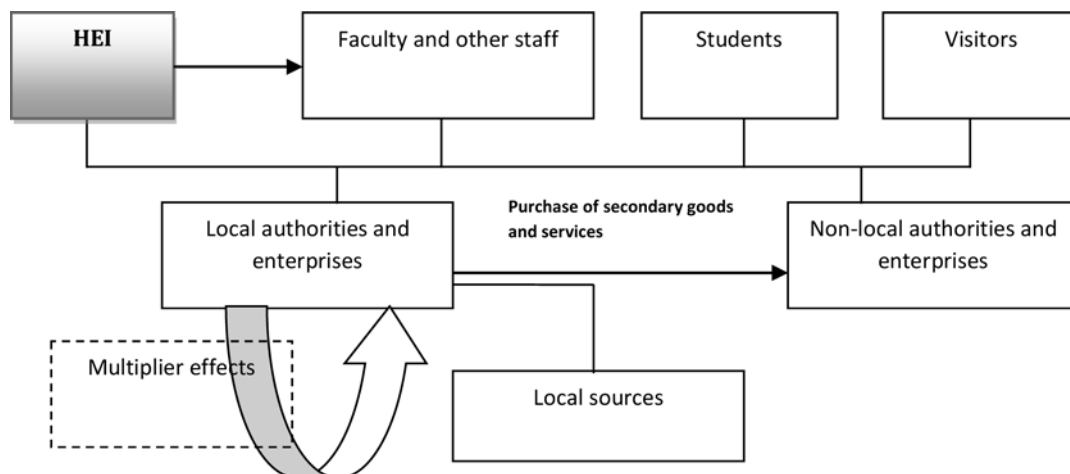
### 3 ESTIMATING THE DEMAND-SIDE SOCIOECONOMIC IMPACT

Due to their daily activity, all HEIs generate expenditure, which, directly or indirectly, influences the economic activity and trade flows of the territory. According to the models that estimate the socioeconomic impact created by demand, the following consumption “agents” can be identified:

- a) the HEI itself, due to current spending inherent to its regular activity;
- b) the HEI’s employees: faculty, researchers, and other staff;
- c) the students;
- d) visitors to students, staff, and the HEI itself (researchers, other students, and external collaborators).

HEIs, as well as their collaborators and students, increase the money supply in circulation, due to their direct and indirect consumption. This circuit (see Figure 1) produces multiplier effects inherent to the interdependent consumption chain: purchase, new consumption, and new purchase.

Figure 1 – Expenditure flow model



Source: Adapted from Caffrey and Isaacs (1971).

If identifying expenditure and consumption of HEIs is easy, based on the values controlled and calculated by their financial offices, the same does not

happen in what concerns the students', employees' and visitors' consumptions. In this case the estimation can be obtained indirectly, through standardized indicators of economic activity, by resorting to the I-O model, or, directly (which some authors consider more reliable), through the application of questionnaires aiming to determine the values and the type of expenditure involved.

When estimating the demand-side impact, more specifically through the ACE model, the calculation structure will additionally imply the examination and discrimination of the effect of purely local businesses, i.e. carried out by local suppliers. It will also include the multiplier effect this consumption has on the production and sales chain. In order to estimate the total volume of the impact, it is necessary, in what this model is concerned, to complement the data obtained through the questionnaires (applied to students and staff) with the data provided by the institution and by several official sources<sup>2</sup>, and also to apply the Retail Gravity Model to determine the factor of purchase (CAFFREY; ISAACS, 1971). The Retail Gravity Model is based on Newton's gravity equation and defends that the amount of money spent on non-housing expenses is inversely proportional to the square of the distance to the point of sale (RYAN; MALGIERI, 1992).

The ACE model involves the need to estimate the global economic impact of an HEI, based on three vectors, according to Caffrey and Isaacs (1971):

- a) the impact on local businesses;
- b) the impact on local administration;
- c) and the impact on individuals.

The estimation of the demand-side impact resorts to complementary methods: the I-O models, the Keynesian Multiplier or the Ryan Short-Cut method. These models, developed from regional and national socioeconomic indicators, are included in the so-called indirect estimation models. On the other hand, by resorting to data directly collected from the source, through questionnaires or interviews, the ACE model, as well as its subsequent simplified versions, is comprehended in the direct estimation impact studies.

## 4 DIRECT ESTIMATION METHODS

### 4.1 The ACE model and the simplified ACE model

In 1970, economists John Caffrey and Herbert H. Isaacs, from California State University, were assigned, by the American Council of Education (ACE), the task of developing a method to determine the quantitative estimation of the economic impact of a school (educational institution) in the territory or locality where it is based. In 1971, Caffrey and Isaacs presented the result of their work, which was unanimously accepted and, in just 15 years, was applied in over 25% of North American universities (LESLIE; LEWIS, 2001). Since then, the method, known as ACE, has been widely used. Some adaptations have been developed in the

<sup>2</sup> In Portugal these sources include: Banco de Portugal (Bank of Portugal), National Institute of Statistics (INE – acronym in Portuguese), Local and Regional Authorities, among others.

meantime, the most commonly acknowledged of which is that developed by Leslie and Lewis, known as the simplified ACE model.

The ACE model comprehends the following (Table 1) dimensions and sub-dimensions:

Table 1 – Dimensions and sub-dimensions of the ACE model

Dimensions	Sub-dimensions
Impact on HEI-related consumption/expenditure - local business (B)	B.1. HEI-related local business volume
	B.2. Value of local business property committed to HEI-related business
	B.3. Expansion of the credit base of local banks due to HEI-related deposits
	B.4. Local business volume unrealized because of the existence of HEI enterprises
Impact on local government (G)	G.1. HEI-related revenues received by local government
	G.2. Operating cost of municipal services provided to public school by local government
	G.3. Value of local government's properties allocable to HEI-related portion of services provided
	G.4. Real-estate taxes foregone through the tax-exempt status of the HEI
	G.5. Value of municipal-type services self-provided by the HEI
Impact on individuals (I)	I.1. Number of local jobs attributable to the presence of the HEI
	I.2. Personal income of local individuals from HEI-related jobs and business activities
	I.3. Durable goods procured with income from HEI-related jobs and business activities

Source: Adapted from Caffrey and Isaacs (1971).

Due to the lengthy and complex nature of these calculations, Leslie and Lewis (2001) defend the application of a simplification of the traditional ACE model. In this simplified version (see Table 2) the calculations focus on just two dimensions, as follows:

Table 2 – Dimensions and sub-dimensions of the simplified ACE model

Dimensions	Sub-dimensions
1.  B.1. HEI-related business	B.1.1. Local expenditure generated by the HEI B.1.1.1. Local expenditure of the HEI B.1.1.2. Local expenditure of staff (teaching and non-teaching) B.1.1.3. Local expenditure of students B.1.1.4. Local expenditure of visitors B.1.2. Purchase to local sources by local enterprises supporting the volume of HEI-related business B.1.3. Volume of local business stimulated by local individuals' expenditure (except the institution, staff and students) resulting from HEI-related income
2. I.1. Number of local jobs attributable to the presence of the HEI	

Source: Adapted from Leslie and Lewis (2001).

The calculation of the number of local jobs attributable to the presence of the HEI depends on the formula:

$$I.1 = B1 + B2 * (B3 + B4),$$

in which:

- B1 = number of HEI employees (faculty and other staff);
- B2 = ratio between the number of full-time jobs and each euro of direct expenditure in the region - these figures are supplied by the National Statistics Institute;
- B3 = value estimated for the local expenditure generated by the HEI;
- B4 = value estimated for the operating costs of municipal services provided to public school by local government (LESLIE; LEWIS, 2001).

Even though the ACE model and its simplified version are broadly used, the approach is not without criticism and flaws, as follows:

- it makes no distinction between the expenditures (consumption) of local residents (students, staff, and visitors) and non-local; this means that the total consumption is considered globally and as new consumption, which, when multiplied by several formulae always generates a very expressive final estimation. This limitation, however, does not have a strong influence on the impact studies of HEIs located in small communities, which attract a quite significant number of non-resident students to the territory. The opposite happens when the method is applied to studies of HEIs located in bigger metropolitan areas and residential areas where the influence of other HEIs may collide, thus causing an overestimation of consumption and, consequently, of the value of impact in the end (GARRIDO-YSERTE; GALLO-RIVERA, 2010; STOCKES; COOMES, 1998).

In order to address this weakness, Beck, Elliott, Meisel & Wagner (1995) and Elliot, Levin & Mesiel (1998) propose that the studies only consider the spending/consumption by students and external collaborators (i.e. those who are not local residents) and the local residents that declare to be part of the community because they moved there to study or work. This gives rise to a new simplified version of the ACE model, which only considers the first line consumptions.

## 5 INDIRECT ESTIMATION METHODS

### 5.1 The Keynesian Local Multiplier (KLM) model

The existing literature broadly considers the keynesian multiplier as a valid instrument to determine the economic impact of HEIs (BLACKWELL; COBB; WEINBERG, 2002; JABALAMELI; AHRARI; KHANDAN, 2010; TAVOLETTI, 2007). Currency affects the real flow of any economy. This situation accounts for the fact that local economic growth, in a small open economy, depends on domestic monetary liquidity (KOHLER; SOUZA, 2004). This is sustained on the assumption that no local economy is closed, and that there is interaction with the productive structure of other regions, which is capable of boosting demand (LIMA; PITAGUARI, 2005).

The keynesian multiplier is thus founded on the existence of an autonomous variation of the planned expenditure. This variation increases the product in a dimension that exceeds the variation of the underlying demand. Evidently, if the demand rises for exogenous reasons, the sales and services provided will outweigh



those that would exist if the factor that triggered the increase in expenditure had not occurred. This increases the income, which, in turn, will make it possible to increment expenditure again. A cycle is therefore generated, in which a new expense gives rise to new proceeds, which, on the other hand, will encourage new expenditure and so on.

This cycle, however, is not infinite, since some loss occurs at every stage of the process. All the income available has two possible applications: consumption and savings. Ultimately, this savings progressively reduces the multiplier effect at each stage of the cycle, until the marginal return and expenditure converge to zero. When such convergence happens, the multiplier effect ends. Irrespective of the existence of multiplier reduction factors, there will be a fraction of demand for goods induced by additional revenues. The total final impact, direct or indirect, on the product and the return is necessarily greater than the initial direct effect. This would not occur only if the indirect effect was null. But that never really happens; the indirect impact is never null, even if the direct effect is. In situations where there is no direct effect, the usefulness of the keynesian multiplier may be questionable.

The use of a keynesian multiplier must reflect the particularities of the region where it is applied (JABALAMELI *et al.*, 2010; SEN, 2011). The calculation of the multiplier develops from the determination of the value directly injected into the local economy, in which:

$$E = L + G,$$

where:

E = expenditure base;

L = wages paid (labour services purchased by the institution);

G = goods and services purchased by the institution.

The keynesian local multiplier for production is estimated by:

$$GOM = Y_f / Y_1,$$

where:

GOM = gross output multiplier;

Y<sub>1</sub> = the first gross local output;

Y<sub>f</sub> = the final gross local output (after all rounds of the multiplier process).

Therefore:

$$GOM = 1 + Y_2 / ([1 - w c (1 - t) (1 - i)] Y_1),$$

where:

GOM = gross output multiplier;

Y<sub>1</sub> = the first gross local output;

Y<sub>2</sub> = the second gross local output;

w = proportion of staff spending on locally produced goods and services;

c = the marginal propensity to consume;

i = indirect tax rate;

t = direct tax rate.

Since the keynesian full multiplier for local disposable income is given by:

$$MLDI = D_f / D_1,$$

where:

MLDI = multiplier for local disposable income;

D<sub>1</sub> = the first disposable income;

Df = the final disposable income (after all rounds of the multiplier process)  
so:

$$MLDI = 1 + (1 - t) (1 - i)Y2 / ([1 - wc(1 - t) (1 - i)] D1),$$

where:

MLDI = multiplier for local disposable income;

Y2 = the second gross local output;

w = proportion of staff spending on locally produced goods and services;

c = the marginal propensity to consume;

i = indirect tax rate;

t = direct tax rate;

D1 = first round impact on disposable incomes on local residents.

The multiplier can also be estimated from the point of view of expenditure. The deduction presented above allows us to conclude that the keynesian multiplier presupposes the existence of a constant marginal propensity to consumption over time. It also assumes other steady parameters, namely the propensity for local purchases, as well as the rates of direct and indirect taxes and the social security contribution. Irrespectively, the main factors that determine the variation in the multiplier results are the proportion of the workers' spending on local products and the students' local expenditure.

## 6 THE RYAN SHORT-CUT (RSC) MODEL

The RSC model is an adaptation of the ACE model, developed in 1981 by G. J. Ryan, who later improved it, in 1992. This model aims to overcome the limitations of the ACE method, resulting both from the Gravity Retail Model calculations and the need to apply questionnaires. The RSC model does not estimate the number of jobs created. Besides, several authors consider it conservative (RYAN; MALGIERI, 1992; SEYBERT, 2003) insofar as it overlooks visitors' spending as well as intangible impacts and effects on human capital.

The RSC method reduces the complexity of data collection, when compared with the ACE model. It excludes the visitors' spending, and this is where it greatly differs from the ACE model. The estimation of the direct economic impact considers only three fundamental types of expenditure, as expressed by this formula:

$$DEI = I + W + S,$$

where:

DEI = direct economic impact;

I = institution's expenditure;

W = workers' expenditure;

S = students' expenditure.

The total economic impact is given by the product of a multiplier by the direct economic impact, in which:

$$TEI = DEI * M,$$

where:

TEI = total economic impact;

DEI = direct economic impact;

M = multiplier.

## 7 THE INPUT-OUTPUT ANALYSIS

This method shows where the resources that the HEI gives its providers go, by identifying the products generated. It requires a considerable amount of information and the analysis could be as detailed as desired. This method is used when the input-output table of the location of the HEI is available, since it allows for the disaggregation of sectoral information required for the analysis.

It is a demand model; this means that the demand is the exogenous element of the economy which originates a series of economic effects with the objective of being satisfied by the interior production. This method shows the effects in the productivity structure of a region as a result of a shock of the final exogenous demand. These effects upon the main economic variables are analysed according to the different activities that compose the economy and can be characterized as: a) direct effects, which take place in the initial volume of the investment and are the effects that take place in the production system in a first round or economic transaction sequence; b) indirect effects, which take place in a second phase of economic exchanges among the different production branches of the system; the initial shock of the final demand gives way to a series of consecutive economic transaction rounds that satisfy the different needs for goods and services of every economic production branch, until the effect of the initial shock ends; and c) induced effects, resulting from the production factors incomes; the increase of income deriving from the growth in the production system generates increases in the consumption of the economic agents, giving way to a series of additional economic transactions throughout the entire economic system (GARRIDO-YSERTE; GALLO-RIVERA, 2010).

The main reasons to base the studies of socioeconomic impacts on this method are that: a) it allows for the comparison between HEIs and territories; b) it permits the assessment of the direct, indirect, and consumer induced effects; and c) the availability of the Input-Output tables allows for the disaggregation of the information required in the model. The models described above are those more frequently applied in impact studies and were also used in our six case studies, as described in the following sections of this paper.

## 8 THE INFLUENCE OF HEIS ON SOCIOECONOMIC DYNAMICS: RESULTS FROM SIX CASES

### 8.1 The objectives of the study

The comparative analysis presented is based on six case studies on the socioeconomic impact of different polytechnic and university on the geographical contexts where they are located. The institutions selected belong to very distinct realities: some located inland and in low demographic density regions, others, on the coast and more densely populated areas. These cases evidence the direct relationship between socioeconomic contexts and the impact created, namely in four (4) dimensions:

- a) impact on the population dynamics;

- b) impact on economic activity;
- c) impact on employment;
- d) impact on scientific, cultural, and social dynamics.

## 8.2 The cases: selection criteria

The six socioeconomic impact studies were selected according to the criteria below. All of them must have:

- a) followed similar comparable calculation methods;
- b) been conducted in HEIs located in regions with different socioeconomic characteristics, in Portugal and Spain. The choice of Spanish cases is justified by the similarity of the territorial socioeconomic dynamics and by the relevant background of impact studies in Spain, where they were carried out earlier than in Portugal.<sup>3</sup>Besides, it was important to select HEIs located in territories with different demographic and economic dynamics;
- c) involved different types of HEIs, i.e. Universities and Polytechnic institutions. In Portugal there is a binary system consisting of university and polytechnic HE, which is why it seems relevant to reflect on the impact created by these two sub-systems;
- d) been carried out within a timeframe no longer than 10 years, this way ensuring that the information is up-to-date.

The cases have different territorial and organizational profiles:

- a) two of them concern two Spanish universities: Alcalá de Henares and Lleida;
- b) four involve Portuguese HEIs: the universities of Porto, Évora and Algarve and the Polytechnic Institute of Beja.

When presenting and analysing the six cases, we do so with the utmost respect for the authorship and copyrights of each individual study.

Table 3 – The cases – characteristics and key data

Research Team	HEI /Year of the Study	Territory of the HEI/ Inhabitants at the date of the study	Students/Staff (teachers, researchers and services and administration staff)
Sandra Saúde Carlos Borralho Isidro Féria Sandra Lopes	Polytechnic Institute of Beja (Portugal)/ 2011/12	Beja Municipality /35,854	Students: 3,190 Staff: 342
Conceição Rego	University of Évora (Portugal)/ 2012/13	Évora Municipality /55,921	Students: 7,500 Staff: 1,000
João Albino Sérgio Santos	University of Algarve (Portugal)/ 2008	Algarve Region /397,040	Students: 9,000 Staff: 1,360

<sup>3</sup> In Spain one of the first impact studies occurred in 1990 (at the University of Lleida, which participates in the present project with a more recent impact study, dating from 2007), whereas in Portugal this type of studies does not emerge before the second half of the first decade of the 21<sup>st</sup> century.

(continuation Table 3)

Ruben Gonçalves Ana Paula Delgado	University of Porto (Portugal)/ 2006/2007	Porto Region (includes all municipalities of Oporto Metropolitan Area) /1,261,864	Students: 27,500 Staff: 4,000
Rúben Garrido- Yserte María Teresa Gallo-Rivera	University of Alcalá de Henares (Spain) /2009	“Corredor de Henares” Region / over500,000	Students: 19,353 Staff: 2,566
Joan Enciso MarionaFarré Mercè Sala Teresa Torres	University of Lleida (Spain)/2007	Lleida Municipality /131,731	Students: 7,610 Staff: 1,480

Source: Saúde, Borralho, Féria e Lopes (2013); Rego (2014); Albino e Santos (2014); Fernandes (2007); Garrido-Yserte e Gallo-Rivera (2010); Enciso, Farré, Sala e Torres (2014).

## 9 METHODOLOGY

### 9.1 Methods applied in the case studies to measure the socioeconomic impacts

In these case studies, the socioeconomic impact was estimated by applying calculation methods on the demand side, resorting to direct and indirect estimation of expenditures and revenues. The characteristics of the methods and calculation procedures used (see Table 4) make it possible to analyse and compare the results obtained.

Table 4 – Methodology applied in each study

HEI - CASE	METHODOLOGY
Polytechnic Institute of Beja (Portugal)	<ul style="list-style-type: none"> <li>• The ACE model and the simplified ACE model</li> <li>• The KLM model</li> <li>• The RSC model</li> </ul>
University of Évora (Portugal)	<ul style="list-style-type: none"> <li>• The KLM model</li> </ul>
University of Algarve (Portugal)	<ul style="list-style-type: none"> <li>• The Input-Output Analysis</li> </ul>
University of Porto (Portugal)	<ul style="list-style-type: none"> <li>• The KLM model</li> </ul>
University of Alcalá de Henares (Spain)	<ul style="list-style-type: none"> <li>• The ACE model</li> </ul>
University of Lleida (Spain)	<ul style="list-style-type: none"> <li>• The Input-Output Analysis</li> </ul>

Source: Saúde, Borralho, Féria e Lopes (2013); Rego (2014); Albino e Santos (2014); Fernandes (2007); Garrido-Yserte e Gallo-Rivera (2010); Enciso, Farré, Sala e Torres (2014).

### 9.2 The procedure for comparative data analysis

Based on the description of the underlying ontological and methodological principles and the results obtained in each case study, thematic content analysis was carried out. Since all the studies determine the socioeconomic impact of the HEIs on the respective territories, at the level of demography, economy, and employment as well as the scientific, social, and cultural dynamics, it was possible to isolate and compare the data within each of these dimensions, for which the results obtained in each case study could be identified.

The comparative analysis of the different cases has contributed to a clearer insight into the vital role of HEIs in the economy and social life of their regions.

## 10 RESULTS

### 10.1 Impacts on the population dynamics

The influence of the HEIs reaches beyond the municipality/region of direct influence, stimulating its gravitational effect, which is evident in all six cases, as shown in Table 5:

Table 5 – Impact on population dynamics

HEI	NON-NATIVE RESIDENT STUDENTS
Polytechnic Institute of Beja (Portugal)	<ul style="list-style-type: none"> <li>78% of students non-native of Beja Municipality</li> <li>47.4% of students non-native of the District of Beja</li> </ul>
University of Évora (Portugal)	<ul style="list-style-type: none"> <li>70% of students non-native of Évora Municipality</li> </ul>
University of Algarve (Portugal)	<ul style="list-style-type: none"> <li>41% of students non-native of the Algarve Region</li> <li>82.5% of native students would leave the region to study if the University of Algarve did not exist.</li> </ul>
University of Porto (Portugal)	<ul style="list-style-type: none"> <li>80% of students non-native of Porto Region</li> <li>4.3% of students are international/foreign students.</li> </ul>
University of Alcalá de Henares (Spain)	<ul style="list-style-type: none"> <li>9 out of 10 students would study at another university outside the region if the University of Alcalá did not exist.</li> <li>19% of students are international/foreign students.</li> </ul>
University of Lleida (Spain)	<ul style="list-style-type: none"> <li>8 out of 10 students would study in another University out of Lleida if this University did not exist.</li> </ul>

Source: Saúde, Borrvalho, Féria e Lopes (2013); Rego (2014); Albino e Santos (2014); Fernandes (2007); Garrido-Yserte e Gallo-Rivera (2010); Enciso, Farré, Sala e Torres (2014).

In addition to this data, it seems also important to underline that each HEI contributes unequivocally to the rejuvenation of the age structure of the population, since it attracts, from outside the region, an expressive group of youngsters aged between 20 and 24.

### 10.2 Impacts on economic activity

Table 6 – Impact on economic activity

HEI	ECONOMIC IMPACT
Polytechnic Institute of Beja (Portugal)	<ul style="list-style-type: none"> <li>Total Amount of the Impact: Between a minimum of 38.72 million euros and a maximum of 46.88 million euros (it varies depending on the estimation model applied).</li> <li>For every euro received from the State Budget, the IPBeja injected between 3.20 and 3.88 euros into the local economy (based on the IPBeja budget in the year of the study).</li> <li>The students spent an average amount of 19 euros (total per year=18 million euros).</li> <li>The average expenditure of the employees amounted to 37 euros daily (total per year = 4.5 million euros).</li> <li>The expenditure of the IPBeja itself and that of students' and staff's visitors reached a total of almost one million euros (986 thousand euros).</li> <li>Among students' and staff's family and friends, 5,166 people visited the municipality and the town, spending an average of 60.5 euros a day.</li> </ul>

(continuation Table 6)

University of Évora (Portugal)	<ul style="list-style-type: none"> <li>Total Amount of the Impact: 58 million euros.</li> <li>For every euro received from the State Budget, the University of Évora injected between 1.20 and 1.30 euros into the district of Évora (based on the University of Évora budget in the year of the study).</li> <li>The expenditure of the students represents 3.6% of the PIB pmm (2001) of the Alentejo Central Region (NUT III) and 1.2% of the Alentejo Region (NUT II).</li> </ul>
University of Algarve (Portugal)	<ul style="list-style-type: none"> <li>Total Amount of the Impact: 75 million euros.</li> <li>For every euro received from the State Budget, the University of Algarve injected 1.34 euros into the economy of Algarve (based on the University of Algarve budget in the year of the study).</li> <li>The students spent, in a year, a total of 25,286 million euros.</li> <li>Each student received, in average, 4.4 visitors spending an average of 50 euros a day.</li> <li>Each staff member received, in average, 6.6 visitors spending an average of 55.6 euros a day.</li> </ul>
University of Porto (Portugal)	<ul style="list-style-type: none"> <li>Total Amount of the Impact: 140 million euros.</li> <li>For every euro received from the State Budget, the University of Porto injected between 1.49 and 1.51 euros into the economy of the Metropolitan Area of Porto (based on the University of Porto budget in the year of the study).</li> </ul>
University of Alcalá de Henares (Spain)	<ul style="list-style-type: none"> <li>Total Amount of the Impact: 167,142 million euros.</li> <li>The students spent, in a year, a total of 76.1 million euros (26% of this amount in house renting and 56% in purchase of local services and goods).</li> <li>Among students' and staff's family and friends, 125,850 people visited the municipality and the town, spending a total of 10.8 million euros.</li> </ul>
University of Lleida (Spain)	<ul style="list-style-type: none"> <li>Total Amount of the Impact: 161,884 million euros.</li> <li>The students spent, in a year, a total of 30 million euros.</li> <li>The expenditure of the employees amounted to 19 million euros.</li> <li>The expenditure of the University amounted to 113 million euros.</li> </ul>

Source: Saúde, Borralho, Féria e Lopes (2013); Rego (2014); Albino e Santos (2014); Fernandes (2007); Garrido-Yserte e Gallo-Rivera (2010); Enciso, Farré, Sala e Torres (2014).

For every euro received from the State Budget, the activity of each HEI has a significant and crucial multiplier effect on the regional economy. In what concerns the volume of businesses generated by the influence of the HEIs, those resulting from expenditure by students and staff, as well as visitors (students' and employees' relatives and friends), are particularly relevant. Detailed analysis of expenditure and revenue between the HEIs and third parties underlines the vital role that each HEI plays in the economic activity of the municipality, the district, and the whole region, in all sectors of activity, from agriculture to services.

### 10.3 Impacts on employment

Table 7 – Impact on employment – job creation

HEI	EMPLOYMENT - JOB CREATION
Polytechnic Institute of Beja (Portugal)	<ul style="list-style-type: none"> <li>4<sup>th</sup> biggest employer of the Municipality.</li> <li>Indirectly responsible for the creation of a minimum of 453 jobs and a maximum of 823 jobs (it varies depending on the estimation model applied).</li> <li>It induces a job multiplier effect of 1.3 (minimum) to 2.4 (maximum).</li> </ul>
University of Évora (Portugal)	<ul style="list-style-type: none"> <li>Indirectly responsible for the creation of 2,200 jobs.</li> <li>It induces a job multiplier effect of 2.2.</li> </ul>

(continuation Table 7)

University of Algarve (Portugal)	<ul style="list-style-type: none"> <li>• Indirectly responsible for the creation of 2,370 jobs.</li> <li>• It induces a job multiplier effect of 1.74.</li> </ul>
University of Porto (Portugal)	<ul style="list-style-type: none"> <li>• Not estimated.</li> </ul>
University of Alcalá de Henares (Spain)	<ul style="list-style-type: none"> <li>• Indirectly responsible for the creation of 4,822 jobs.</li> <li>• It induces a job multiplier effect of 1.88.</li> </ul>
University of Lleida (Spain)	<ul style="list-style-type: none"> <li>• Indirectly responsible for the creation of 1,688 jobs.</li> <li>• It induces a job multiplier effect of 1.14.</li> </ul>

Source: Saúde, Borralho, Féria e Lopes (2013); Rego (2014); Albino e Santos (2014); Fernandes (2007); Garrido-Yserte e Gallo-Rivera (2010); Enciso, Farré, Sala e Torres (2014).

Globally, and considering the direct and indirect impacts on jobs, all studied cases account for structural and very expressive employment rates in the municipality or region.

#### 10.4 Impacts on scientific, cultural, and social dynamics

Additional data in the six study cases can also confirm that each HEI transforms and promotes the scientific, cultural, and social dynamics of the region:

- a) each HEI community is a significant consumer of the cultural provision of the municipality/region. Regarding cultural consumption/practices and the profiles of citizen participation, we concluded that:
  - on cultural consumption (theatre, cinema, concerts, fairs and exhibitions, bars and cafés, for example) each HEI community spent expressive amounts, playing a key role in defining the profile of the local cultural offer and consumption
  - both staff and students evidence a significant social participation, namely in community activities, the majority for volunteer organizations, such as cultural and sports associations or clubs.
- b) other benefits associated with the presence of an HEI include the following:
  - provision of facilities belonging to the HEI campus to the local community and entities: libraries, amphitheatres, galleries, classrooms, football fields and multi-sports infrastructures, laboratories and testing centres, and so on;
  - promotion of various scientific, pedagogical and cultural activities and events, organized by its several organic units, departments, centres and offices, accessible to the whole community;
  - development of laboratory experiments and applied research, in collaboration with local and regional enterprises;
  - supply of services to municipal and regional companies and institutions, in the fields of laboratory analysis and specialized consulting services at controlled costs;
  - participation in the social capital of several local and regional institutions and organizations;
  - provision of facilities used as the seat of local and regional institutions and organizations.



## 11 CONCLUSIONS

Higher Education institutions have a strong multidimensional impact on the communities. One of those dimensions is, in the short term, the socioeconomic. HEIs are a source of first-level economic consolidation, since they attract people and businesses, stimulate the commercial circuit, and invigorate regional economic dynamics. Besides, they retain people in the territory, attract students, who become temporary local consumers and eventually develop their life projects there. These vectors are crucial when considering the impact of HEIs, as they determine the quality of human capital, the productive and economic dynamics, and the social biorhythm.

The impacts of the presence of HE are multiple, both direct and indirect, for the boost to local/regional economy and society. Higher education also induces short and long-term impacts, due to the transformation it causes in the social and technological capital of the territory. In addition to their two basic missions, training and research, the HEIs have strongties of interdependence and mutual involvement with the community/region, which are a natural result of their action but are often underestimated when assessing the significance and impact of HEIs.

The estimated socioeconomic impact of each HEI included in this study provides evidence of the generated multidimensional effects but is still a conservative estimation of the global impact, since other dimensions have to be taken into account, such as long-term effects. These outcomes or qualitative type effects (impact of the institution on the citizens' quality of life, or as a determinant factor influencing company location, etc.) are important to acknowledge, even though it may be complex to undertake the analysis of these impacts. The study of HE socioeconomic impacts contributes to highlight the key role that academic communities play in the development of local, regional and national economies. This effect is even more expressive in smaller regions of low population and economic densities.

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