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Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom

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ABSTRACT

Throughout economic history, institutions have established the rules that shape human interaction. In this sense, political, socio-cultural, and economic issues respond to particular forces: managed economy or entrepreneurial economy. In the entrepreneurial economy, the dominant production factor is knowledge capital that is the source of competitive advantage, which is complemented by entrepreneurship capital, representing the capacity to engage in and generate entrepreneurial activity. Thus, an entrepreneurial economy generates scenarios in which its members can explore and exploit economic opportunities and knowledge to promote new entrepreneurial phenomena that have not been previously visualised. In this context, the entrepreneurial university serves as a conduit of spillovers contributing to economic and social development through its multiple missions of teaching, research, and entrepreneurial activities. In particular, the outcomes of its missions are associated with the determinants of production functions (e.g. human capital, knowledge capital, social capital, and entrepreneurship capital). All these themes are still considerate potentially in the research agenda in academic entrepreneurship literature. This paper modestly tries to contribute to a better understanding of the economic impact of entrepreneurial universities' teaching, research, and entrepreneurial activities. Taking an endogenous growth perspective, the proposed conceptual model is tested using data collected from 2005 to 2007 for 147 universities located in 74 Nomenclature of Territorial Units for Statistics-3 (NUTS-3) regions of the United Kingdom. The results of this exploratory analysis show the positive and significant economic impact of teaching, research, and entrepreneurial activities. Interestingly, the higher economic impact of the United Kingdom's entrepreneurial universities (the Russell Group) is explained by entrepreneurial spin-offs. However, our control group composed by the rest of the country's universities, the highest economic impact is associated with knowledge transfer (knowledge capital).

1. Introduction

Throughout economic history, institutions have established the societal rules that shape human interaction (North, 1990) and have contributed to the configuration of the main sources of growth during the process of economic change (North, 2005). This fact explains why political, socio-cultural, and economic issues respond to particular forces: the managed economy and the entrepreneurial economy. According to Audretsch and Thurik (2001), in the managed economy there are many products (bulky ones in the lower parts of the production chain) and services (distribution and communication networks) that can be best offered in a routinised and predictable approach. On the other side, the entrepreneurial economy is not confined to the role of small businesses and business owners, but also it is the pervasive socio-economic mindset of thinking in terms of opportunities rather than in terms of resources. It is based upon ideas and knowledge rather than on investments that create more of the same. It is based upon persons rather than on organisations (Bonnet and Van Auken, 2010). Therefore, while the central theme of the entrepreneurial economy is the exploration of entrepreneurial opportunities (based on knowledge inputs/outputs and characterised by uncertainty, government enabling, the economies of diversity, and small enterprises), the managed economy focuses on the exploitation to transform traditional inputs (land, labour, capital) into manufactured products (characterised by certainty, governmental control, the economies of scale, and large corporations).

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Following this perspective, in each economic model, institutions facilitate the activity that serves as the driving force underlying economic growth and prosperity. In particular, the main focused of this paper is the entrepreneurial economy, where the dominant production factor is knowledge capital as the source of competitive advantage, which is complemented by entrepreneurship capital, representing the capacity to engage in and generate entrepreneurial activity (Audretsch, 2007). Thus, an entrepreneurial economy generates scenarios in which its members can identify and exploit economic opportunities and knowledge to promote new entrepreneurial phenomena that have not been previously visualised (Mueller, 2007; Shane, 2005). An increased importance of the university, in terms of its impact on the economy, is observed within the entrepreneurial economy (Aldrich, 2012; Audretsch, 2012). For these reasons, universities become more entrepreneurial in order to compete, and they become more productive and creative in establishing links between education and research (Kirby et al., 2011). Moreover, an entrepreneurial university can provide new alternatives to the university community, which typically identifies entrepreneurial opportunities (Guerrero and Urbano, 2012). As a consequence, the economic impact of universities has gained the attention of academics, governments, and policymakers around the world, who in turn are making efforts to encourage these universities.[1]

Given the complexity of university functions, previous studies have evidenced the economic impact of university teaching, research, or entrepreneurial activities by adopting different theoretical approaches and methodologies (Drucker and Goldstein, 2007). Traditionally, in the 1980s, the analysis focused on the impact via the labour force supported on the foundations of a managed economy, and research was conducted using descriptive input–output analysis at the university level (Elliott et al., 1988). In the 1990s too, the methodology of choice to measure the economic impact of university research activities was input–output analysis (Goldstein, 1990; Jaffe, 1989). Later, in the 2000s, more sophisticated methodologies were employed (i.e. productivity, total factor productive analysis, return of investments analysis, quartile regression analysis, etc.) to explore the direct impact of specific research activities or the indirect impact of knowledge spillover (Audretsch et al., 2005; Bessette, 2003; Guerrero and Urbano, 2014; Martin, 1998; Roessner et al., 2013; Siegel et al., 2003). However, the natural role of universities in economic development is less well understood than is often presumed (Bramwell and Wolfe, 2008). According to the microeconomic foundation of endogenous economic theory (Lucas, 1988; Romer, 1986), investments in knowledge and human capital generate economic growth. However, beyond generating commercialisable knowledge (patents, licenses, and agreements) and qualified research scientists (graduate students), universities produce other impacts, such as the generation of and attraction to new ventures, jobs, talent, and collaborations with local, regional, and international agents. According to Audretsch (2012, p. 7), the role of entrepreneurial universities is broader than only generating and transferring knowledge; an entrepreneurial university contributes and provides leadership for the creation of entrepreneurial thinking, actions, institutions, and what he refers to in his previous studies as 'entrepreneurship capital'. Under this scenario, entrepreneurial universities have emerged as central actors playing an active role in promoting teaching, innovation, knowledge transfer, and entrepreneurship (Urbano and Guerrero, 2013).

There are still some themes to be covered in the research agenda of academic entrepreneurship such as appropriate measures and method to study this phenomenon (Grimaldi et al., 2011, p. 1053). Based on that, our main objective is to contribute to a better understanding of the economic impact of entrepreneurial universities' activities (teaching, research, and entrepreneurial). With this objective, our conceptual framework fundamentally adopts the Endogenous Growth Theory with the understanding that the main forces of economic growth—in particular, investment in human capital, knowledge, and entrepreneurship—are endogenous (Audretsch and Keilbach, 2004a,b). The endogenous growth theory primarily holds that the long-run growth rate of an economy depends on policy measures such as subsidies, support measures, or incentives, to increase the growth rate (Romer, 1986). For this reason, Mustar and Wright (2010) argued that the creation of new start-ups could be explained by the convergence or path-dependent effect of policies fostering entrepreneurship. Methodologically, this exploratory study tests the proposed model of the economic impact of entrepreneurial universities with a structural equation analysis, using data from 2005 to 2007 from the Higher Education Statistics Agency (HESA) and the Centre for International Competitiveness in the United Kingdom. The modest contributions of this study are twofold. We propose a theoretical framework to understand the economic impact of each entrepreneurial university's core activity (teaching, research, and entrepreneurship) on the entrepreneurial economy. We also explore a new way to test this phenomenon and overcome the shortcomings of other techniques, such as input–output analysis (i.e. the economic impacts of universities extend well beyond the types that can be accounted for in this analysis).

We begin our paper by putting into context entrepreneurial universities and the range of social economic impact. In doing so, we highlight previous approaches that have been taken to measure the impact of universities, using descriptive or financial analysis, input–output modelling, and total factor productivity modelling. We then describe our conceptual framework adopting the determinants of production functions (human, knowledge, and entrepreneurship capital). Later, we describe the data collection, proxies, and methodology used in the paper. We conclude by presenting our results, implications for policy and practice, and the limitations of the study. We also suggest some areas for future research.

2. Entrepreneurial universities' activities and economic impacts: an endogenous growth perspective

2.1. Economic impact of universities: previous measures

Methods to empirically investigate universities' economic impacts have advanced since the 1980s. Today, more robust measures and more sophisticated analytical methods are applied to explore these impacts. The unit of analysis has also grown from being single campus-based studies to a system-wide university analysis (see Table 1). The main focus of these studies has been input-output relationships rather than the economic impact. They measured outputs in terms of contributions via the labour force (Bessette, 2003; Chrisman et al., 1995; Elliott et al., 1988), revenues obtained from patents, R&D collaborations (Siegel et al., 2003), spillover effects (Audretsch and Lehmann, 2005), or total university earnings (Goldstein, 1990). On the other hand, the main inputs were associated with direct expenditures incurred to develop the inputs (Bessette, 2003; Goldstein, 1990) and total factor productivity (Martin, 1998; Roessner et al., 2013; Siegel et al., 2003;

[1] According to the ISI Web of Knowledge (Thomson Reuters), the results for the search term 'economic impact of university activity' show that approximately 317 papers analysing the economic impact of universities were published during the last 20 years (1994–2013). Interestingly, more than 50% of these papers were published in the last five years (2009–2013) alone.

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