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## Location choices of graduate entrepreneurs<sup>☆</sup>

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### ABSTRACT

We review complementary theoretical perspectives on location choices of university graduate entrepreneurs derived from the individual-opportunity nexus and local embeddedness perspectives on entrepreneurship. Analysis of the full population of 215,388 graduates from Swedish institutions of higher education between 2002 and 2006 provides support for both location choice perspectives. Overall, 63% of graduate entrepreneurs start businesses locally in their region of graduation while 37% start businesses elsewhere. The likelihood of starting locally is substantially higher in metropolitan regions, if the graduate was born locally or has university peer entrepreneurs and entrepreneurial family members in the region of graduation. Implications for theory and public policy are discussed.

### 1. Introduction

The contributions of universities to entrepreneurial activities are wide-ranging, including both direct effects through the creation of ventures by faculty, students and recent graduates as well as indirect effects through graduates first seeking employment and later starting their own ventures (Boh et al., 2012; Wennberg et al., 2011; Wright et al., 2008). In terms of direct effects, the entrepreneurial activities of students and graduates appear to substantially outweigh those of university employees and thus constitute a particularly important mechanism for generating local economic activity and growth (Astebro et al., 2012; Bramwell and Wolfe, 2008; Etzkowitz et al., 2000; HESA, 2015). Evidence that faculty spin-offs are limited both in terms of numbers and returns (e.g. Wennberg et al., 2011), has led to an increased focus among both scholars and policy makers on student startups across several countries (e.g. Dahlstrand and Berggren, 2010; Fini et al., 2016; Hsu et al., 2007; Lazear, 2005; Lerner and Malmendier, 2013). However, many university students move locations after graduation and the extent to which they start businesses close to their place of graduation or elsewhere has not been studied.

The importance of formal human capital for successful entrepreneurship (Van Praag et al., 2013) and the importance of new business activity for regional growth (Fritsch, 2013) motivate an inquiry into the location choices of highly educated entrepreneurs. This paper seeks to advance the recent but growing strand of research on entrepreneurship among university graduates by examining both their likelihood of entrepreneurship and the location choices of those that engage in entrepreneurship. The limited studies examining localization choices indicate that graduates are more likely to start their ventures in the region where they complete their studies, even after controlling for birth region (Baltzopoulos and Broström, 2013). As our interest lies in elucidating this literature we focus on the locational choice element and begin by outlining a theoretical framework focused on this stage. The research question that we ask is: *What regional factors influence the probability that graduates who start firms do so in their region of graduation?* This question has direct research and policy implications concerning the localization of economic activity and the potential of utilizing universities to support local economic development. For example, local incubators will have little local impact if graduates eventually move away to start their businesses.

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From a theoretical viewpoint, studying the location choices of university graduates who engage in entrepreneurship is particularly interesting. Students graduating from university seeking to become entrepreneurs have invested extensively in human capital – investments they need to recover. They can either choose to work for somebody else to recover these investments or choose to engage in entrepreneurship. On graduation, sunk costs in specific careers, or family obligations, are likely minimal. University graduates are also at their most mobile life-stage, with a large proportion moving locations directly following graduation (Government Office for Science, 2016; Kodrzycki, 2001). Following graduation, university students who embark on an entrepreneurial journey are in a unique position to choose the locations of their businesses that provide the best opportunities for them. Later in life, such localization decisions are likely influenced by a wider range of other considerations (Dahl and Sorenson, 2009).

Two main theoretical arguments concerning localization choices of graduate entrepreneurs can be derived from the entrepreneurship literature. The individual-opportunity nexus view argues that businesses emerge at the intersection of entrepreneurial individuals and attractive opportunities (Eckhardt and Shane, 2003; Shane and Venkataraman, 2000). Business opportunities tend to be more abundant in urban agglomerations with strong demand and extensive purchasing power (Glaeser, 2007). Graduates in metropolitan regions thus face ample opportunities and should be more likely to act on these, *ceteris paribus*. Conversely, local embeddedness logic posits that proximity to supportive social networks and familiarity with local businesses constitute important drivers of localization decisions for entrepreneurs (Dahl and Sorenson, 2012; Ruef, 2010). According to this logic, we would expect university graduates to be more likely to remain in the locations in which they graduate. This behavior may be especially strong if they have family or university peers in the same region, or originally hail from the region.

We set out to explore the prevalence of university graduates' entrepreneurship and to test the extent to which the empirical patterns are consistent with these two theoretical perspectives. We do so by examining the full population of 215,388 individuals graduating from Swedish institutions of higher education between 2002 and 2006. Our results indicate that close to two-thirds (63%) of the graduates who start businesses do so in the region where they graduate, while 37% start their businesses elsewhere. We find ample support for both theoretical perspectives. Specifically, students living in metropolitan areas are more likely to engage in entrepreneurship, and also more likely to run a business in the local area after graduation, consistent with the individual-opportunity nexus view. Our results also highlight the importance of peer effects from other graduate entrepreneurs, supporting the local embeddedness perspective. When analyzing graduates' location choice with respect to starting their firms in the region of graduation, the metropolitan variables are strong predictors of local startups. Location choices are also influenced by local embeddedness relating to the presence of parent entrepreneurs and university peer entrepreneurs. Implications for theory and policy are discussed.

## 2. Theory and research on university entrepreneurship

Entrepreneurship is a central mechanism through which universities are believed to foster local economic development (Baptista et al., 2011; Fini et al., 2011; Grimaldi et al., 2011). Empirical research in this vein has focused primarily on entrepreneurship among university employees rather than among students or recent graduates (Rothaermel et al., 2007; Siegel and Wright, 2015b). One of the few studies on

location choices of former university employees examined the location of biotech firms spun out of US universities, finding that the location of the founders, other firms in the industry, and venture capitalists all influenced their location choice (Kolympiris et al., 2015). A more general study on the location choices of 35,000 entrepreneurs in Sweden – a third of them being university graduates – showed that graduates are significantly more likely to start ventures in the region where they complete their studies, even after controlling for birth region (Baltzopoulos and Broström, 2013).

In terms of economic impact, however, the predominant focus on university employees rather than students seems misplaced. Recently, Astebro et al. (2012) used data from the U.S. Scientists and Engineers Statistical Data System (SESTAT) to compare entrepreneurship in the 1995–2006 period among faculty and university graduates with at least a bachelor's degree in science or engineering. Based on population-weighted samples comparing entrepreneurship rates and individual earnings as entrepreneurs among recent graduates and faculty, their findings indicated that students are a far more important source of university entrepreneurship than current or former faculty, and student companies do not seem to be of lower quality than those of current or former university employees. Similarly, using Swedish data, Wennberg et al. (2011) found that startups by graduates who initially worked for private firms performed better than startups by those who initially worked for universities. Together, these findings suggest that to understand the wider economic impact of university-based entrepreneurship, a focus on university employees may be too narrow. University graduates constitute an important and understudied contribution to university-based entrepreneurship.

It is also important to acknowledge heterogeneity across universities regarding their ability to support and foster entrepreneurship. Universities differ substantially in terms of structure, resources, and commercial culture (Stuart and Ding, 2006). This means that there are likely important differences across universities in the magnitude and nature of entrepreneurial activities of their graduates. Research into this topic, however, is notably scarce and limited to comparative case studies of two or a few universities (Clark, 2004; Perkmann et al., 2013; Rothaermel et al., 2007). Some scholars propose that universities located in regions with concentrated financial and business communities are best positioned to foster entrepreneurship because of spatial proximity benefits (Martin et al., 2005). Elite universities in these regions may be at a particular advantage. In the UK, for example, some studies have pointed to the importance of the so-called 'Golden Triangle' of Cambridge, London and Oxford universities (Smith and Ho, 2006). In contrast, ventures emerging from universities outside such locations have been shown to attract funding by relying on quality signals relating to either the university or the founding entrepreneur (Mueller et al., 2012). In regions with more than one university, only the parent university appears to influence academic entrepreneurs' decisions to stay in the region (Hebllich and Slavtchev, 2014).

Wright et al. (2008) distinguish between types of universities and the types of regions in which they are located, arguing that 'mid-range universities' are less likely to have critical masses of world-leading research than leading or elite universities. The distinction between 'mid-range regions' and 'urban regions' stem from the former being less likely to involve regions with extensive and deep corporate and financial infrastructures that generate entrepreneurial opportunities and mechanisms to fund and support them.

In sum, it appears that universities differ in their capacity to foster entrepreneurship. This likely influences the entrepreneurial activities of university employees and students as well as graduates, which is the focus of the present paper.

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