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Title: Do universities generate bi-directional effects in emerging economies' innovation ecosystems?

Authors: Paola Rücker Schaeffer, Bruno Brandão Fischer, Maribel Guerrero

Presenter: Maribel Guerrero

Abstract:

Universities are identified as organizations that generate and diffuse knowledge, but also interact with several actors, promoting regional development. In this context, the concept of entrepreneurial university emerges, being demanded of that these organizations engage in several forms of technology transfer. Assuming that universities act as anchors in regional development, this article analyzes their role in the structural dynamics of innovation and entrepreneurship ecosystems

In developed countries, the interactions between universities and ecosystems' actors are bi-directional. It allows identifying the impact of universities in the innovative and entrepreneurial activities of firms, as well as understanding how firms provide relevant resources and capabilities to universities. In emerging countries, universities are seen as capable organizations of leveraging regional capabilities. However, the bi-directional relationships among actors tend to be scarce, informal and influenced by dominant actors. As a result, emerging countries' academic organizations face these challenges that make difficult to fulfill their role as entrepreneurial universities. Thus, the following research questions are proposed: how do universities' activities support knowledge flows in innovation and entrepreneurship ecosystems within an emerging economy context? And how do innovation and entrepreneurship ecosystems' actors support the role of these organizations?

Method

Twenty-four actors of different innovation and entrepreneurship ecosystems were interviewed between September and November of 2018. These interviews included technology transfer offices, leaders of research groups, research centers and companies of the Program PIPE/FAPESP. These agents located in five representative ecosystems of the state of São Paulo, in which the main research intensive universities are also located: Campinas, Ribeirão Preto, São Carlos, São José dos Campos and São Paulo. The research protocols covered several dimensions of analysis: structure and resources, technology transfer, generation of spin-offs, generation of results/impacts in general, internal barriers, geographical dimension of ecosystems, and institutional context.

Preliminary results and implications

Preliminary results suggest that universities play a pivotal role in the analyzed ecosystems. This goes beyond formal relations, also including informal relations with firms and student entrepreneurs. The supply of qualified human resources is highlighted as a main contribution of academia to these ecosystems. Joint research projects and sharing of infrastructures are also mentioned. Additionally, the role of star scientists stands for a key mechanism of academic entrepreneurship. Moreover, it was possible to identify that universities also depend on the support of the firms with which they interact through: (1) provision of

financial resources for research projects and for maintenance and acquisition of research assets; (2) entrepreneurial mentoring; (3) generation of new scientific ideas, which can be explored in dissertations and theses; and (4) exploitation of intellectual property rights. In this sense, industry plays an important role in bringing academia closer to market practices and other commercial partners. Several implications emerge from these results. Concretely, policy makers need to understand the systemic nature of the relationships present in innovation and entrepreneurship ecosystems. In addition, even if the impacts of universities are bounded to the local level, it is the global connections that enable academic organizations to leverage regional innovation capabilities.

Title: University-industry collaboration and regional innovation: Does university research quality matter?

Authors: Kwadwo Atta-Owusu, Rune Dahl Fitjar, Andrés Rodríguez-Pose

Presenter: Kwadwo Atta-Owusu

Abstract:

Regional innovation policy is increasingly focused on the role of universities in generating innovation and regional development. The number of universities in the world has been growing rapidly, and universities are also increasingly keen to contribute to their regions. However, the geography of scientific research is highly spiky and there are strong Matthew effects in research funding. Furthermore, university-industry collaboration tends to be mainly regional, even more so than other types of innovation collaboration. Hence, the impact of university research tends also to be fundamentally local. This raises the question of whether a regional innovation policy focused on universities may exacerbate the currently uneven regional development trends in the global economy. In light of this, there is a need to examine how peripheral regions engage with universities.

The paper, therefore, investigates the drivers of university-industry collaboration. We first explore whether collaboration with regional, national and international universities is a function of characteristics of the firm or the university. Specifically, we are interested in how the quality of the local university affects the likelihood that firms will interact with local universities and universities outside the region.

The paper draws on a dataset compiled from several sources. Using Norway as the empirical context, we gathered information on firm characteristics from three waves of the Community Innovation Survey (CIS) of Norway, supplemented with the Norwegian Linked Employer-Employee Data (LEED). This yielded a representative sample of over 18,000 firms. In addition, we utilized Scopus data to develop a measure of the research quality at the local university in the field most relevant to the firm's industry.

Intriguingly, the results of the analysis show that local universities' research quality relates negatively to collaboration. This indicates that research intensity or excellence-oriented mission of universities can be unfavourable to collaboration with firms. Distance to a university revealed a curvilinear (U shaped) relationship with collaboration, suggesting proximity to a university matters only to a point after which distance has little influence on collaboration. On the firm side, all the factors tested (R&D intensity, size, other collaborations, and human capital) exhibited positive association with collaboration across diverse spatial scales. This finding confirms the notion that firm attributes play substantial role in determining collaboration decisions.

Title: University-industry interactions from proximity lenses: Reflections from Norway

Authors: Utku Ali Riza Alpaydin, Rune Dahl Fitjar

Presenter: Utku Ali Riza Alpaydin

Abstract:

The interaction between academic and industrial partners is problematic due to a number of factors (Bruneel et al., 2010). The concept of proximity, through its geographic and non-geographic dimensions, has been regarded as a facilitating attribute of interactions, which can eliminate those barriers and ease the process of coordination in these interactions (Boschma, 2005). However, the linkage between university-industry interactions and proximity dimensions has not been dealt extensively. The existing literature has examined this linkage with a narrow focus on innovation-related outputs such as patent citations (Jaffe et al., 1993) and collaborative R&D projects (D'Este et al., 2013). However, the university-industry interactions do not always directly aim at innovation, and involve many other types of interactions (Ankrah & Al-Tabbaa, 2015). The geographical scope of these numerous university-industry interaction channels and the role of different dimensions of proximity on the process of interaction remain unexplored.

Therefore, this paper aims at providing an understanding on the importance of dimensions of proximity in university-industry interactions. The addressed research questions are twofold:

RQ1: Which kinds of interactions are realized at which geographical scales?

RQ2: Which dimensions of proximity are required for what kinds of interactions?

This paper takes a quantitative methodology approach and relies on survey data of 1,201 Norwegian firms located in university regions. For the survey, university-industry interactions have been categorized under three headings (*research-oriented, education-oriented and other interactions*) covering 18 distinct types of interactions ranging from joint research projects to training of firm staff/employees and to creation of new ventures/firms (Spin-offs, start-ups).

The dimensions of proximity were adapted from the framework proposed by Boschma (2005) consisting of geographical, cognitive, organizational, institutional and social proximity. For geographical proximity, a spatial categorization of four scales (within region, within country, within Europe, outside Europe) has been used. For non-geographical dimensions of proximity, the concepts have been operationalized in a novel manner, which distinguishes between the organizational and the personal level. We expect research-oriented interactions to be realized at higher geographical scales than education-oriented and other interactions.

The initial results show that only 19% of the surveyed firms have interacted with universities in the last three years. The most popular interaction types are joint research projects, student projects and informal consultations, in all of which the most dominant geographical scale is within-region interactions.

The study supports the notion that university-industry interactions are mainly realized at the local/regional level. The results convey that the intensity of UIINs decrease when the distance between the interacting parties increases for almost all UIIN types. However, research-oriented interactions are less bounded by

limitations of distance and more inclined to occur in geographical distance compared to other UIIN categories, in line with our expectations.

Title: Knowledge flows between universities and industry: The impact of distance, technology compatibility and ability to diffuse knowledge

Authors: Nivedita Mukherji, Jonathan Silberman

Presenter: Jonathan Silberman

Abstract:

This paper investigates university knowledge transfer by the citations to university patents in the patent applications filed by firms. These citations to previously issued patents capture the transfer of knowledge from past research efforts to innovate new products and processes. Data is compiled for the 91 largest research universities in the using the NBER patent citation data. We estimate a spatial interaction model of the origin (university) to destination (industry) citation flow aggregating industry citations to 142 metropolitan areas (MSAs). Separation factors are distance, technology compatibility, location in the same city as the university, and state border. The fixed-effects coefficients measure the ability of universities to diffuse knowledge (providing a ranking of universities) and the ability of MSAs to absorb university knowledge. The distance and spatial origin and destination variables provide measures of knowledge spillovers from university patents. Public v private universities are analyzed separately. We find citations to university patents are significantly higher for universities in the same city as the citing business. The same city effect is greater for public than private universities. The distance indicator variables show that citations at most distance categories are not statistically different than citations beyond 2000 miles. Technology compatibility of university with industry patents has a significant impact on university patent citations, and exhibits considerable variation across university-MSA pairs. MIT has the largest fixed effect (diffusion) estimate more than twice Stanford the next university. Technology centers such as San Francisco, San Jose, Boston, and Research Triangle have high ability to absorb university knowledge from patents. Fixed effects (diffusion and absorption) have a greater impact on knowledge flow than the separation factors for most university-MSA pairs.