Assessment of entrepreneurial activity in innovative system: Towards measurement models and indicators

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Introduction

Innovation as a socioeconomical phenomenon has been recognized as a crucial role player in strengthening competitive advantages of economies and long-term growth. Effective innovation policies provide opportunities for diminishing the innovation gap between emerging economies and innovation leaders. Government as the major funder and supporter is also obligated to provide a platform where innovations can flourish and foster. The concept of Multi-helix systems has been using a system theory trying to understand in what way the knowledge and innovation system interacts with multiple components such as political and economic systems for the purpose of regional development. The concept of the Triple Helix of university-industry-government relationships initiated in the 1990s by Etzkowitz (2003) which has raised unprecedented attention. Through subsequent development, a significant body of Triple Helix theoretical and empirical research grew over the last two decades that provides a general framework for exploring complex innovation dynamics and for informing national, regional and international innovation and development policy-making. The evolution of the concepts led to recognition of new components and actors in order to shape the knowledge economy. In addition to university, industry and government, another major component has been introduced which adds civil society and a "media-based and culture-based public" as a helix in the innovation system (Carayannis & Campbell 2009). Civil society and the public are users and appliers of knowledge and are thereby contribute with a region-specific context and experiences. Accordingly, Quadruple Helix implies a broader understanding of knowledge production, involving culture, arts, media, values and lifestyle. These factors, also including the manner in which media construct public reality, are expected to influence the creative environment in a specific region and, in turn, the innovation system (Carayannis & Campbell 2012). As a relevant concept in this context, Richard Florida (2004) also has coined "creative class" which consist of creative people that are the key drivers of urban and regional growth. Furthermore, the findings reveal some evidence of a positive relationship among creative class occupation, employment growth, and entrepreneurship at the regional level in a number of European countries (Boschma & Fritsch 2009).

Meanwhile, a number of attempts have been made by researchers and policymakers to evaluate different aspects of the Triple Helix model in the context of regional innovation systems. Some authors focus on connectedness between different actors. The interaction between the Triple Helix actors is captured by specific indicators such as bibliometrics and patent indicators that can provide insights on trends and patterns of public-private cooperation, its geographical concentrations and implications. Special focuses on university-industry interaction has been performed in which the connectivity between academic sciences and industrial research is captured and measured empirically (Tijssen 2006).

Our approach is to extend the evaluation and measurement practices towards the evolving linkages covering Quadruple Helix concept. In this paper, we attempt to explore, explain and enact the conceptual as well as practical linkages between a new societal context represented by quadruple helix with the basic model of innovation core known as triple helix. A narrow perspective within the classes of a civil society recognized as creative class or entrepreneurs activity and contribution at societal level. That is not to say that entrepreneurs or other value creators and innovation agents are only found in civil society, but indeed they could compliment and reinforce similarly minded individual in the government, university and industry.

Methodology

The approach taken in this study focuses specifically on quantifiable information related to the activities regarding entrepreneurship and new business growth and its dissemination to society at large.

In order to illustrate the entrepreneurship activity in a regional level, various indexes has been carefully observed. In addition, for designing multidimensional indicators, special focus on new and novel sources of data has been encountered. Social media data (twitter) will be utilized to capture the vitality of the most dominant innovation ecosystem subsystem known as an entrepreneurial community within particular region. Also, a set of 55,000 records retrieved from Crunchbase service which profiles startups and new businesses in countries will be explored. The advantage of having companies profile and their respected funding rounds enabled us to utilize text analytics techniques to see the activity of the innovation ecosystem within regions. Unstructured data from social media and public data sources will be acquired and transformed into an informative indicator. This process will be followed by other relevant regional data representing the social and cultural attitude towards entrepreneurship that will be bundled and validated by developed indexes.

Expected results

A new quantifiable information will be provided with respect to Quadruple helix and its context of society for triple helix. An empirical framework to measure the linkages between Triple helix (basic model of the innovation core) and the context of society for Triple helix known as Quadruple helix will be introduced.

The process of multidimensional creation of indicators will encounter text mining and text analysis in social media for transformation the unstructured data to an informative indices. New indices of social media data representing the societal linkages to the knowledge economy as a core would be considered the most added value of this study.