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# Critical assessment of entrepreneurial and innovative universities index of Turkey: Future directions

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## ABSTRACT

The aim of the paper is to present a new performance measurement concept and a relevant methodology for entrepreneurial universities which serves the ideal of transforming into an innovative one and contributing to the economic development and societal benefits. The current Entrepreneurial and Innovative Universities index which is in place in Turkey is evaluated according to the available perspectives in excellence of Higher Education Institutions and domains for advancement are being discussed. Furthermore, standard evaluation of the universities with ranking methodology is argued proposing a conceptual framework based on non-linear dynamics of systems thinking. Consequently, further directions in research, policy and university management are delivered putting forward the view that the entrepreneurial university ecosystem requires innovative approach in all aspects.

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## 1. Introduction

Commercialization and transfer of knowledge created at universities are multi-dimensional phenomena for economic development fueling job creation, global competitiveness, and industrial transformation. “Entrepreneurial university” is the third mission attached to the higher education institutions in addition to their role in research and education; the key economic actor of the future is expected to be the cluster of firms associated with knowledge producing institutions such as universities (Etzkowitz, 2013). There are multiple methods of creating value with university–industry collaboration such as “introducing new sources of ideas into the academic research agenda, addressing scientific concerns as well as practical problems, increasing the university’s financial independence through its own income-generating capacities, and contributing more directly to sustainable regional development and societal advancement” (Etzkowitz, 2013, p. 504). The underlying argument in favor of engagement in science based innovation activities by universities is the facilitation of economic development, job creation and global competitiveness (Bradley et al., 2013).

“Entrepreneurial scientist” who engages in those innovation activities at their affiliated institutions (Etzkowitz, 2013) can be attached to the notion of academic entrepreneurship as the potential entrepreneur may engage in wealth creation and prestige seeking behavior while transferring the polyvalent<sup>1</sup> knowledge and science into practical and

financial business mostly as spin-offs (Etzkowitz, 2013; Etzkowitz and Viale, 2010). On the other hand, Abreu and Grinevich (2013) suggested, academic entrepreneurship should be extended to the overall set of activities beyond licensing, patents and spinoffs. Spinoffs are more common in life sciences due to the nature of product development with the long time horizon of market entry whereas in social sciences, consultancy and contract research are more common. Abreu and Grinevich (2013) conceptually framed academic entrepreneurial activities as; formal commercial activities including licensing and spinoffs, informal commercial activities beyond patenting including consultancy, contract research, joint research projects; non-commercial activities providing informal advice, giving public lectures, organizing exhibitions, and publishing books for general audience.

The entrepreneurial university serves the mission of quick and far-reaching regional development which is built on integration of trained personnel, suppliers, and financing systems forming similar enterprises in high technology industries (Chrisman et al., 1995). The entrepreneurial university with its traditional mission of teaching and research, contributes to the advancement of knowledge with applied research and it is entrepreneurial as long as it is responsive to the stakeholders namely as other higher education institutions, chambers of commerce, development agencies, industry, financing institutions, non-governmental organizations, media (Philpott et al., 2011; Davies, 2001). In order to be responsive, knowledge stock should be aligned with regional and/or industry needs leading a new third task environment and culture which requires the faculty to acquire new knowledge, skills; and the university management to define strategies and tasks in order to motivate and encourage academic entrepreneurship. “The entrepreneurial university” value is built upon the perceived excellence by its stakeholders namely

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<sup>1</sup> Etzkowitz and Viale (2010) explain polyvalent nature of knowledge being both theoretical and practical, both publishable and patentable.

as university scientists, technology transfer offices, and firm/entrepreneur (Siegel et al., 2003).

Farsi et al. (2012) elaborated an input-process-output-outcome model of entrepreneurial universities fostering the debate on the dynamic system including;

- Special Inputs namely as Resources, Rules and regulations, Structure, Mission, Entrepreneurial capabilities, and Expectations of the society, industry, government and market
- Processes namely as Teaching, Research, Managerial processes, Logistical processes, Commercialization, Selection, Funding and financial processes, Networking, Multilateral interaction, and Innovation, research and development activities
- Outputs namely as Entrepreneur human resources, Effective researches in line with the market needs, Innovations and inventions, Entrepreneurial networks, and Entrepreneurial centres
- The Overall aim to mobilize all of its resources, abilities and capabilities in order to fulfil its Third Mission.

On the basis of the evidence available, it seems fair to suggest that an entrepreneurial university is the one which is not only adaptive to its environment but is proactively seeking sound strategies and new configurations (Kirby, 2006) to shape its environment by standing a good financial position, selecting the best students and teachers, attracting best researchers, creating new insights in traditional teaching and research missions, developing innovative management styles, building the context for interaction and collaboration between university, industry, government and stakeholders (Inzelt, 2004).

As entrepreneurial transformation of universities takes place in the institutional sphere, national level innovation policies attempt to determine necessary regulations, incentives, configurations and performance indicators. One of those attempts is in place in Turkish Higher Education System with the annual index of Entrepreneurial and Innovative Universities releasing performance results of universities on multiple indicators. Based on a detailed analysis of available evidence in entrepreneurial performance indicators, one can claim that current index which is used to compare and rank universities for their entrepreneurial and innovative orientation is open to advancement at two levels. First of all, the indicators should be enriched by overall objective of conducting such an analysis which is increasing the level of engagement by universities in entrepreneurial activities in order to serve global competitiveness of national economies. Secondly, the methodological issue should be resolved in order to offer a roadmap for universities which may have different paths to the overall success of delivering value to the society and the economy.

This paper is organized as follows. Section 2 develops the concept of performance measurement at universities based on a comprehensive discussion of innovative indicators and methodological concerns. Section 3 critically analyses the current Entrepreneurial and Innovative University Index of Turkey explaining the missing concepts. In Section 4, a new approach based on systems thinking is discussed by offering a conceptual framework from which dynamic hypotheses and indirect effects can be retrieved. Coupled with previous evidence, Section 5 concludes the research, policy and management implications for future directions in universities' entrepreneurial performance measurements.

## 2. Literature review

### 2.1. Enhancing measurement of entrepreneurial performance of universities

Entrepreneurial potential of universities can be examined in five key areas of activity (Entrepreneurial University Leaders Program, 2013).

- Research, knowledge transfer and exchange;
- Stakeholder relationship and partnership development at the local, regional and national level;

- Internationalization processes;
- Enterprise and entrepreneurship pedagogy and knowledge organization across the university; and
- Governance, strategy, organization design and leadership at all levels.

In addition to the activity model, measuring performance of entrepreneurial universities can be categorized as a four layered process based on the framework provided by O'Shea et al. (2004, p. 24) for university spin-off activities:

1. "The academic's reasons for engaging in entrepreneurial activity (individual characteristics studies);
2. The attributes of universities such as human capital, commercial resources and institutional activities (organisational-focused studies);
3. The broader social context of the university, including the "barriers" or "deterrents" to spin-offs (institutional and cultural studies);
4. The external characteristics such as regional infrastructure that impact on spin-off activity (external environment studies)."

Likewise, previous research approached the analysis distinguishing between institutional level and individual levels where units of analysis are whole university, part of it, or the academic scientist (Wright et al., 2009). Individual characteristics studies for performance measurements may focus on mapping faculty motivations, resource needs, and capabilities, and reporting to what extent the affiliated institution (university) is responsive to those and providing the necessary infrastructure, training, programs to encourage faculty in the name of an entrepreneurial mission. Klofsten and Jones-Evans (2000) claim that universities should support young researchers for entrepreneurial activities at their initial training stage. Franklin et al. (2001) have shown that academics may not realize their entrepreneurial potential due to inexperience in commercialization activities although they possess entrepreneurial endeavors. Individual motivation matters in its organizational context subsequently as the initiation of technology transfer is led by faculty disclosure to technology transfer offices (Bercovitz and Feldman, 2008).

Organizational level studies are based on more quantitative methods which are common in traditional research & development capabilities' studies. However at that level, one should be cautious to include or exclude criteria because not all research & development capability transforms into entrepreneurial performance. Among, patent statistics is widely used as an indicator of future economic use of protected knowledge; in fact, the potential knowledge transfer is much broader than the quantitative measures of commercialization phenomena (Etzkowitz, 2013). The number of patents available at technology transfer office within a certain time interval is the traditional performance indicator of a typical technology transfer office however it has been regarded as a limitation in further studies (Bradley et al., 2013). In another study, Di Gregorio and Shane (2003) have argued that sponsored research funding may not transform into start-up activity comparing the number of start-ups in Stanford University (25 technology licensing office start-ups) and Duke University (none) which listed sponsored research expenditure approximately with the same amount. Moreover, performance studies should also focus on the on-going performance of spin-offs in terms of profitability, cash flow generation and survival (Lockett et al., 2003).

Measurements of performance should build this link for example between patents and technology transfer in order to deliver solid performance results. Understanding the ultimate results of entrepreneurial activity may create new directions, as well, in order to make best use of organizational resources. The University of Calgary case (Chrisman et al., 1995) shows that ventures created by outside entrepreneurs with faculty assistance grew larger than academic spin-offs in terms of employment and scaling-up. Thus, one can ask whether nominating number of spin-offs, patents, amount of research funding as a success criteria is sufficient for measuring performance.

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