



Entrepreneurial universities and research ambidexterity: A multilevel analysis



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ARTICLE INFO

Article history:

Received 28 May 2015

Received in revised form

4 December 2015

Accepted 27 February 2016

Available online 9 March 2016

Keywords:

Entrepreneurial universities

Research ambidexterity

Multilevel analysis

ABSTRACT

This paper develops the notion of research ambidexterity (RA) in the context of the entrepreneurial universities. Two levels of research ambidexterity are elaborated – departmental and individual. The putative multilevel relationships between university's antecedents, departmental/individual research ambidexterity and commercial performance are examined. On the basis of a postal questionnaire survey, a dataset of 634 faculty members, 99 departments, and six universities is collected. The results of regressions suggest that both levels of RA facilitate departmental and individual commercial performance, respectively. Moreover, there exist multilevel positive relationships between perceived organizational flexibility, departmental RA, and individual RA and opportunity exploitation. The paper concludes that the development of RA in entrepreneurial universities should be considered as multilevel relationships between universities, departments and individuals.

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1. Introduction

The growth of entrepreneurial and other commercial activities by academic institutions has stimulated an increasing amount of scholarly investigation over the last three decades. The development of the notion of “entrepreneurial universities” (Etzkowitz, 1983) has been examined from several different perspectives including institutional deregulation (Mowery et al., 2001), the triple-helix approach (Etzkowitz and Leydesdorff, 2000), university-industry technology transfer (Etzkowitz, 2003, Geuna, 1998), research commercialization (Siegel et al., 2003; Markman et al., 2008), and academic spin-offs (Rasmussen et al., 2011; Shane, 2004a; Wright et al., 2006). As universities seek to become more entrepreneurial, so the development of effective mechanisms to integrate the two activities of research publication and research commercialization has become a major challenge (Ambos et al., 2008; Chang et al., 2009).

Prior research suggested the multiple disclosure choices of

research findings, including the option to publish research in academic literature and obtain intellectual property rights (IPRs) over that knowledge (Murray and Stern, 2007). However, research publication and research commercialization are two relatively distinct tasks, which are sometimes in conflict with one another. The tensions arise as faculty members are asked for doing one thing (research publication) and at the same time requiring them to develop capacities for doing something fundamentally different (research commercialization). Academic research commercialization may be challenged by the institutional priorities, academic routines, and faculty retention (Finkle and Deeds, 2001). The role identity of academics and entrepreneurs are found to be different for university scientists in terms of norms, process, and outputs (Jain et al., 2009). The trade-offs occur at the different levels of the organization (university/school/department) as it strives to manage these two activities with the limited capability and resource, and also at the individual level of faculty member who has to balance his or her research agenda and time allocation between competing tasks.

Most previous studies that have investigated the issue of organizational ambidexterity form part of the organizational learning literature (e.g. Kuchinke, 1995; March, 1991), the innovation studies literature (e.g. Jansen et al., 2006; Smith and Tushman,

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2005), the strategic management literature (e.g. Ghemawat and Ricarti Costa, 1993), and the organizational design literature (e.g. Eisenhardt and Martin, 2000; Tushman and O'Reilly, 1996). In each of these, it has been proposed that there are distinct and often conflicting tasks to carry out in an organization, in particular exploration as distinct from exploitation, but also radical innovation as opposed to incremental innovation, adaptation as opposed to alignment, and flexibility in contrast to efficiency (e.g. Ambos et al., 2008; Debackere and Veugelers, 2005; Gibson and Birkinshaw, 2004). Recently, the distinction between two organizational behaviors has been interpreted broadly to encompass the tendencies of specialization and experience, on the one hand, and diversity and experimentation, on the other (Lavie et al., 2010). Adapted from the concept of organizational ambidexterity, this paper develops the notion of 'research ambidexterity' which is more appropriate to apply to the development of entrepreneurial universities. It is necessary to jointly develop both research publication and research commercialization when universities pursue more entrepreneurial and commercial activities. This paper elaborates the concept of research ambidexterity (RA) in the context of entrepreneurial universities in order to shed light on the strategic contradictions between research publication and research commercialization and how they may be resolved.

The notion of ambidexterity has been investigated at various levels of analysis, such as individual (e.g., Ambos et al., 2008), subsidiary unit (e.g., Gibson and Birkinshaw, 2004), and organization (e.g., Jansen et al., 2006). However, the existence of organizational hierarchies and the cross-interactions between the different organizational levels with regard to facilitating ambidexterity have been less well studied. Moreover, Simsek (2009) argued that organizational ambidexterity studies should start from a multilevel model that includes the organization level, and the environment level to further examine the interrelationships between antecedents, ambidexterity and performance. Universities and departments can collectively develop nourishing contexts, in turn shaping individual faculty members' attitudes and behaviors. To address this research gap with regard to research ambidexterity in entrepreneurial universities, this paper analyzes the intra-organizational and multilevel interactions between individuals, departments and universities which may jointly influence the development of research ambidexterity in entrepreneurial universities. We argue that there is a need for such a multilevel investigation of universities, departments and individuals in order to successfully develop the research ambidexterity within academic institutions.

The structure of this paper is as follows. The theoretical foundations of the tasks involved in research publication and research commercialization in entrepreneurial universities are considered. We develop the notion of research ambidexterity to be applied at the levels of the department and of the individual faculty member. Moreover, the putative relationships between cross-level RA and performance are also developed in terms of a number of specific hypotheses. Details of the data collection, data analysis and operationalization of the relevant variables are set out in the methods. The descriptive statistics, correlations and multiple regression models are presented and analyzed in the results. The comparisons between these research results and those from previous studies are discussed. Finally, a number of conclusions are drawn.

2. Theoretical model

2.1. Research ambidexterity in the entrepreneurial university

Globally, institutional reforms enlarge the functions of universities to include teaching, research works and knowledge

Table 1
Traditional universities versus entrepreneurial universities.

	Traditional universities	Entrepreneurial universities
Structure	<ul style="list-style-type: none"> • Department, Laboratory, Research center... 	<ul style="list-style-type: none"> • Department, Laboratory, Research center... • TTO, Incubator, Spinoff...
Goal	<ul style="list-style-type: none"> • Knowledge creation 	<ul style="list-style-type: none"> • Knowledge creation • Knowledge utilization
Action	<ul style="list-style-type: none"> • Academic routines 	<ul style="list-style-type: none"> • Academic routines • Research commercialization
	(Teaching, Research publication and Public service)	

utilization. The entrepreneurial attribute of universities is suggested to speed up the pace of industrial innovation (Wright et al., 2006). In order to become more entrepreneurial, traditional universities evolve to organizational structure, goal and relevant behavior (see Table 1). Consider the dual goals of research publication and research commercialization, entrepreneurial universities tend to remain the former one initiated by IPR inventors who work for disciplinary departments or research centers, and the later one governed by administrative mechanisms such as TTOs, incubators, or spin-offs (Chiesa and Piccaluga, 2000; Debackere and Veugelers, 2005). Traditional universities tend to focus on academic routines, however, entrepreneurial universities act to integrate academic routines and research commercialization (Bercovitz and Feldman, 2008). The discipline attribute and peer recognition in a university department where the faculty members employed are suggested to influence the intersection of academic and commercial science (Stuart and Ding, 2006).

Prior research has suggested that managers not only have to *differentiate* between exploration and exploitation with their conflicting tensions, but also to *integrate* these two activities (e.g. Jansen et al., 2009; Smith and Tushman, 2005). The differentiating view treats exploration and exploitation as essentially *separate* activities that interact little with one another. Specifically, the *capacity to differentiate* is an organizational capability to recognize, articulate and reinforce the distinctions between exploration and exploitation activities (Smith and Tushman, 2005). In contrast, under the *integrating* view exploitation and exploration are regarded as mutually interacting activities which therefore need to be combined to achieve effective ambidexterity. Smith and Tushman (2005) argued that to develop an integrating capacity requires a multilevel analysis in order to identify potential linkages and determine how best to integrate these.

Moreover, Gibson and Birkinshaw (2004) suggested that the goal of sustained organizational ambidexterity can be achieved both on the basis of a top-down "structural ambidexterity" approach and on the basis of a bottom-up "contextual ambidexterity" approach. Specifically, structural ambidexterity can be achieved through structural separation, task partitioning, temporal separation, and appropriate leadership (Adler et al., 1999; Galbraith, 2002; Tushman and O'Reilly, 1996), whereas contextual ambidexterity involves a set of processes that encourage individuals to make their own particular judgments about the conflicting demands that they face (McDonough and Leifer, 1983; Tushman and O'Reilly, 1996). On the basis of these arguments, this study suggests research ambidexterity can be facilitated at the levels of organization and individuals.

In order to balance research publication and research commercialization, a university may facilitate not only the capacity to *differentiate* but also the capacity to *integrate* the two tasks through various structural and contextual configurations. Entrepreneurial universities have increasingly encountered certain tensions between knowledge diffusion widely and findings hidden

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