The 2019 Technology Transfer Society Annual Conference
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Session 3.4 – Chair: Shauna Brail
Location – Board Room

Title: Endowing university spin-offs pre-formation: Entrepreneurial capabilities for scientist-entrepreneurs

Authors: Jon Thomas, Martin Bliemel, Cynthia Shippam-Brett, Elicia Maine

Presenter: Jon Thomas

Abstract:

Universities spin-offs are an important mechanism for the commercialization of public science. Spin-offs emerging from universities contribute to regional development and economic growth. However, the majority of science-based university spin-offs fail to survive. To better understand how science-based university spin-offs can be endowed for success, we analyze the *pre-formation* stage of 30 ventures co-founded by a focal scientist-entrepreneur over a 40 year period. Using a unique, longitudinal, multi-level dataset consisting of 1476 publications and 363 granted US patents matched to these 30 co-founded ventures, we inductively develop a model depicting four pre-formation entrepreneurial capabilities with which these science-based university spin-offs are endowed for success. We show how these entrepreneurial capabilities can be developed in the research lab and suggest that innovation policies aimed at innovative start-ups focus on supporting scientist-entrepreneurs in the pre-formation stage of university spin-off emergence.

Title: Assessing the role of championing leadership in enhancing academic entrepreneurship: Evidence from U.S. research universities

Authors: Haneul Choi, Donald Siegel

Presenter: Haneul Choi

Abstract:

All research-intensive universities have establishing technology transfer offices TTOs (Bercovitz & Feldman, 2008), as well as numerous programs and initiatives to promote entrepreneurship and the commercialization of university research (Siegel and Wright, 2015), demonstrating that the norm of academic entrepreneurship has been fully diffused. However, there are huge variations in actual university technology transfer activities. Against this backdrop, researchers have asked the following questions: Why are the widespread adoption of TTOs and encouragement of university technology transfer activities not producing the expected outcomes? Why is there variation in technology transfer outcomes among the universities?

This study adopts a "micro-level" perspective on academic entrepreneurship, focusing on psychological and organizational factors that may affect this activity. Given that a successful university technology transfer is ultimately up to the active involvement of individual academic scientists, micro perspective can provide a better insight into academic entrepreneurship (Balven, Fenters, Siegel, & Waldman, 2018).

Balven et al., (2018) propose three types of micro factors within academic entrepreneurship: 1) self-contained micro-processes that incorporate cognitive or affective phenomena; 2) relational factor focused on interaction with other individuals (i.e., department chair, colleagues, etc.); and 3) interaction between individuals and organization level factors (i.e., university tech transfer policies, organizational culture).

Among three types of micro processes, we take the second and the third perspective of micro-processes focusing on leadership roles in reducing barriers to academic entrepreneurship. Specifically, this study examines whether the championing leadership mitigates the negative impact of 1) lower organization level receptiveness to academic entrepreneurship; and 2) lack of information - scientist's weak understanding and knowledge of how to initiate technology transfer processes.

We test our hypotheses using longitudinal data from 391 academic scientists and engineers at 25 major U.S. research universities. Our econometric results indicate that championing leadership can have a positive influence of the propensity of scientists to engage in academic entrepreneurship. We find no evidence of an association between lack of receptiveness to academic entrepreneurship and technology transfer intention of university scientists. However, we find that informational barrier (i.e., confusion regarding commercialization process, lack of knowledge whether and how TTO can help them engage in academic entrepreneurship) is a strong factor that undermines academic scientist's intention to engage in technology transfer activities in the future.

We find no evidence of any direct role of championing leadership. However, we find that championing leadership mitigates the negative relationship between the informational barrier and future technology transfer intention. The finding, in general, suggests that academic entrepreneurship is well received, at least in our study sample, and may no longer be a huge barrier for potential academic entrepreneurs. However, informational barriers such as scientists' confusion regarding the technology transfer process and their lack of awareness of TTO's role, may still be a huge barrier to academic entrepreneurship. There could be many ways to help potential academic entrepreneurship, and this study suggests the role of championing leadership as an alternative to foster academic entrepreneurship.

Title: On universities' ability for technology transfer: Do technology transfer office cohorts matter?

Authors: Dolores Modic, Jana Suklan

Presenter: Dolores Modic

Abstract:

University technology transfer is a big and controversial business, administered by a growing occupational group, Intellectual property (IP) coordinators. This paper explores the cohort effect, answering the question whether IP coordinators in same cohort exhibit similar patterns in patenting and licensing, thus contributing to the university technology transfer literature, especially the debate on the individual level factors (Wu et al, 2015).

Technology transfer literature using the concept of cohorts has focused on researchers and not on technology transfer staff. Cohort effect has also been recorded for a similar group of experts, patent examiners (Frakes and Wasserman, 2016). Similar works encompassing TTOs remain absent, although early moments of employment are important in shaping attitudes, skills and practices of new staff (Van

Maanen and Shein, 1979; Joshi et al, 2010; Zheng et al, 2013). Cohorts and their potential effects are suboptimally conceptualized and researched in terms of different groups inside the technology transfer processes. We present a model allowing for assessment of cohorts' effects in technology transfer offices on individual level data. Within this study we test two hypotheses:

H1: Coordinators in the same cohort exhibit similar patenting patterns.

H2: Coordinators in the same cohort have similar level of success and experience in licensing.

For the analysis we build a database using the university's patent applications data from year 1984 to 2014, merged with licensing data. In order to gain an accurate picture of the cases assigned to individual IP Coordinators, we added their employment and cases' (re-)assignment data. Final dataset is (dynamic) time series data, eliminating the problem of relying on static data. Our database includes 18393 cases of IP Coordinators handling patent cases, and a sub-set of 845 licensed cases.

Our descriptive and discriminant analysis demonstrate that the year in which an IP coordinator is hired, has an effect on their patenting and licensing proclivities. Variations between cohorts suggest that IP coordinators may follow distinct and enduring practices throughout their career. Yet, the biggest distinctions between cohorts do not seem to be connected with IP coordinators' immediate licensing and patenting output, but rather with underlying mechanisms and practices, e.g. cognitive proximity attitudes.

Our analysis holds a number of important implications for public policy and organizational competitive advantage of individual universities, as IP coordinators can be catalysts for commercialization success.

Title: The impact of knowledge networks on the identification of entrepreneurial opportunities by Early-Stage-Researchers (ESRs)

Authors: Marie Gruber, Thomas Crispeels, Pablo D'Este

Presenter: Marie Gruber

Abstract:

Research about EO highlights the importance of social networks, as mechanisms to access tangible and intangible resources – such as new knowledge and information. The relationship between knowledge and networks has led to the emergence of the concept of knowledge network: "a set of nodes - individuals […] that serve as heterogeneously distributed repositories of knowledge and agents that search for, transmit, and create knowledge - interconnected by social relationships" (Phelps, Heidl, & Wadhwa, 2012, p.3). However, previous studies have often failed to capture two important aspects. On the one hand, existing research has mainly investigated the knowledge networks of senior academic staff and principal investigators, rather than junior researchers' ones. On the other hand, these studies also often use an ex-post approach that lacks a dynamic perspective and is not well-suited to capture the evolution of the network and the knowledge that is exchanged through the ties. In this research, we aim to address these two challenges by investigating the following research question: *How and when do ESRs' knowledge networks contribute to enhance the identification of entrepreneurial opportunities?*

To answer our research question, we conduct a qualitative, mixed-methods study on 14 early-stage researchers, all within the first 3 years of their doctoral research. The first step comprises an online survey

oriented to collect information on ESRs' knowledge networks, and which was distributed already twice in a six-month interval to all ESRs. We ask for important sources of knowledge and spotlight 5 types of knowledge: (1) generic and (2) specific scientific knowledge, (3) business-related knowledge and (4) present and (5) future career knowledge. A ranking shows the value of the provided knowledge. The results further allow us to identify the crucial nodes in each of the knowledge networks. Complementary, we conducted 29 interviews with the ESRs, their supervisors and technology transfer officers (TTOs) to deepen our understanding on how ESRs access knowledge and when they identify and/or abandon (entrepreneurial) opportunities during their PhD trajectory. Interviews with both TTOs and supervisors help us to capture and understand whether the entrepreneurial/scientific orientation of an institution or a research group influence on the ESRs' opportunity identification. Through the active participation in the project, we have the opportunity to build a longitudinal database, which allows us to further analyse the dynamics of the interconnections between reported contacts by all ESRs and follow up on the development of identified opportunities. Our findings show that some ESRs value mobility as a possibility to access new sources and knowledge which results in new ideas and opportunities. We propose that those ESRs take a more central position in the network and foster their relationships. Also, mainly two out of approximately 120 nodes in the network provide valuable knowledge to the ESRs among the five types of knowledge. In contrast, the majority of nodes stands out in one type of knowledge. Through the interviews, we find evidence that the entrepreneurial/scientific orientation of the research group leaders rather than the overall vision on an institutional level impacts ESRs opportunities identification.