

THE CREATION OF SPINOFF COMPANIES BY ACADEMIC INVENTORS: AN IMPORTANT ENTREPRENEURIAL PHENOMENON

Javed Nayyar Malik,

OYA GSB, University Utara Malaysia,
Sintok, Kedah Darulaman, Malaysia.

Dr. Rosli Bin Mahmood,

OYA GSB, University Utara Malaysia,
Sintok, Kedah Darulaman, Malaysia.

ABSTRACT

The spin-off companies established by academic inventors are an important entrepreneurial phenomenon as well as a vital catalyst for economic development. Thereupon, this paper will bring clarity to understand the process involved by which university spinoffs emerged; specifically the intentions, motivations of university-based inventors and the factors influencing actual spinoff activities such as to form companies and otherwise commercialize inventions in universities.

Keywords: Entrepreneurship, Inventors, economic development.

INTRODUCTION:

Academic inventors create spin-offs companies that are an important entrepreneurial phenomenon. According to Shane (2004) university spinoffs stimulate economic development and impact greatly by bringing state-of-art technologies in the market. This paper will bring clarity to understand the process involved by which university spinoff emerged because this particular area is sparsely researched (Markman et al., 2005). Mostly the literature covers the role of universities and their technology transfer offices (TTOs) in spinoff formation. For the establishment of academic spinoffs it is necessary that a technology inventor will start a company (Shane, 2004). Due to the vitality of inventors it is worthy to look for the individual role in spinoff process. So, because of the importance of university-based spin-offs and the inventors' intentions to exploit their inventions through spinoffs it is better to understand the factors that affect entrepreneurial intentions of an inventor would have theoretical and practical implications for policy makers and university technology transfer practitioners.

This paper reveals the inventors' intention to commercialize their technologies via spinoffs as well as their attention to data collection at the earliest stages of venture creation process. The process of university spin-offs or any other commercialization starts when an inventor files his or her invention disclosure (ID) with the administrative office responsible for commercialization of university-based technology i.e. technology transfer office (TTO). Here, the inventor discloses all the resources of the university that are involved in creating the invention capable of intellectual property. Therefore, ID is the first indication which makes the inventor believes that there is something worth in the invention than an academic research (Jaume et al., 2006).

The inductive and empirical evidences are also available about academic entrepreneurs' intentions and motivations to start companies. Specifically, we elaborate the intentions, motivations and the factors influencing actual spinoff activities such as to form companies and otherwise commercialize inventions in universities.

THEORETICAL BACKGROUND:

ENTREPRENEURIAL INTENTIONS:

To understand the spinoff formation process, we are to examine first the motivations that compel an inventor to start a business. Bird (1992) defined intention as "*a state of mind directing a person's attention, experience and behavior towards a specific object or method of behaving*" (p. 11). According to Nelson (2003) company founders are the people who think to launch a business and implement the decision. The founders influence the firm they establish as long as they remain actively involved in the venture (Gupta & Rubenson, 1998). Founders' intentions represent an important means by which they influence their organizations (Bird & Jelinek, 1988).

Mostly, the literature on founder intentions focuses on the intention to start a new organization whereas entrepreneurial intentions span a vast variety of potential areas (Douglas & Shepherd, 2002; Krueger Jr. & Reilly, 2000). We focus the factors that influence the inventors' intentions and motivations to pursue a spin-off. These motivations help particularly to understand the intentions of the founders (Jaume et al., 2006). Here, we explore a variety of motivations to pursue the same end, the new venture startup. These motivations elaborate the behavior of the founders to launch and manage a venture such as the strategic goals and the processes by which they hunt these goals (Jaume et al., 2006).

INTENTIONS OF ACADEMIC ENTREPRENEURS:

According to Shane (2004) university inventors always want to launch their own business because they are "*entrepreneurial types*" and become seedling towards university spinoffs. To support this claim, Shane (2004) invoked evidence in the entrepreneurship literature showing that entrepreneurs differ from other members of society in their psychological attributes and argued as well that there is sufficient anecdotal evidence to suggest three basic psychological motivations for inventors to start spinoffs: (1) a desire for wealth; (2) a desire to bring the technology to market (regardless of the financial implications), and (3) a desire for independence and also career-enhancement goals (related to status and university affiliation) as a fourth class of motivations underlying entrepreneurial intentions of university-inventors. Along with psychological attributes there are also demographic characteristics are a part of motivations. However, Seashore et al. (1989) found no significant relationship between individual level intentions and spin-off formation as an entrepreneurial attitude among life-scientists at major research universities.

While Jaume et al., (2006) supported strongly by reviewing existing literature that intentions of university-inventors are much involved in academic spinoff process. Also, most of the current wisdom about the motivations of academic entrepreneurs is based on retrospective accounts which are subject to post hoc rationalization and may be colored by outcomes of the decisions. Jaume et al., (2006) also argue about individual attributes to file invention disclosure (ID) for protecting intellectual property can influence intentions

of university-based inventors. The motivation to file an ID illuminates the value placed on scientific, commercial or social outcomes (e.g., those who believe that their invention will not get to the public unless they start a company will be motivated to be directly involved in the process of starting a company to do so).

KEY MOTIVATIONS OF UNIVERSITY-INVENTORS BEHIND FILING AN INVENTION DISCLOSURE (ID) AND TO LAUNCH A SPIN-OFF:

An academic inventor files an invention disclosure (ID) with many intentions that do not guarantee that he or she will commercialize the invention and launch a business as well. Many IDs have little potential for commercialization because the academic inventors have different kinds of pressure to do so such as to boost university ranking, to seek research funding etc. Thus, mere counts of IDs, or patent filings, or the like, may be very misleading indicators of the actual commercial potential of the technology associated with the IDs being filed at a given university. This paper will elaborate the actual intentions of an academic inventor to file ID and to start a spinoff. Ajzen (1991) theorizes that an individual engaged in a specific behavior is the result of some intention. Not surprisingly, this finding had been corroborated in the entrepreneurship literature, where intentions have been found to be the single best predictor for entrepreneurial behavior (Krueger & Reilly, 2000). So, it is very important to find the real intentions of university inventor to understand the initiation of the spinoff process. Here, existing literature also led us to consider other factors related to intentions and expectations. Generally speaking, behavioral theory suggests that past behavior or experience is a strong predictor of intended future behavior. Additionally, the work of several authors (Markman et al., 2005; Powers & McDougall, 2005; Shane, 2004) suggests that differences in location (university resources and culture, TTO policies, regional infrastructure) and industry norms may also play a role in commercialization intent and expectations.

CONTEXTUAL FACTORS IN ACADEMIC INVENTORS' INTENTIONS TO START COMPANIES:

Markman et al., (2005); Powers & McDougall, (2005); and Shane, (2004) explored to some extent the relation between contextual factors and actual spinoff formation. And the entrepreneurship literature has some evidence about the influence of contextual factors on entrepreneurial intention (Bird, 1988). Therefore, the contextual factors are linked to entrepreneurial intentions of inventors' actual spinoff formation.

The university setting; in varieties of ways across universities the institutional context is linked to university spinoffs as one of the main contextual factors;

- 1) The university policies related to technology transfer can either boost or slow down spinoff creation process (Markman, et al., 2005; Shane, 2004). For example, the policy of licensing to spinoffs for equity rather than for cash facilitates spinoff formation, as it reduces the spinoff's capital needs and improves its cash position (Di Gregorio & Shane, 2003).
- 2) The Technology Transfer Office (TTO) and its structures, resources and expertise play a very important role in spinoff creation process by influencing, directing and supporting academic inventors to seek a suitable commercialization form (Powers & McDougall, 2005; Shane, 2004).
- 3) The (entrepreneurial) cultural environment of the institution.
- 4) The *presences of entrepreneurial role models* among faculty are other factors affecting spinoff formation related to the university setting (Shane, 2004).

The external environment surroundings beyond the university itself have implications for spinoff creation;

- 1) *Regional entrepreneurial networks and clusters* (Sorenson & Audia, 2000) may have an impact on university-inventors' intentions to start spinoffs as well as access to social capital;
- 2) *Access to early stage financing sources*, especially venture capital, can also foster the emergence of spinoffs (Shane, 2004) because venture capital firms tend to be clustered around certain geographical areas (Gupta & Sapienza, 1992), *the physical location of the university* can influence its spinoff activity. Thus, the availability or no availability of resources can affect the expectation of an academic inventor to commercialize his or her invention.

Lastly, the industry targeted for the invention can have implications for spinoff and/or licensing options. On the one hand given the importance to spinoff success of protecting the uniqueness and differentiability of an invention, the effectiveness of intellectual property protection in a given industry is also a key determinant of the choice between academic spinoff and licensing (Shane, 2001). While on the other hand the industries like Biotech involve a lengthy, expensive and uncertain processes so there are rare cases of spinoffs. Other industry aspects like market segmentation and number of firms in the field can positively affect academic inventors' intentions to launch a spinoff (Shane, 2004).

CONCLUSION:

So, the literature provides the inductive and empirical evidences about academic entrepreneurs' intentions and motivations as well as the factors that lead to start companies. Thus, *the intentions* are; 1) a desire for wealth; (2) a desire to bring the technology to market (regardless of the financial implications), (3) a desire for independence and also career-enhancement goals (related to status and university affiliation) as a fourth class of motivations underlying entrepreneurial intentions of university-inventors and (4) demographic characteristics: *themotivations* are past behavior or experience, differences in location (university resources and culture, TTO policies, regional infrastructure) and industry norms: and *the factors* influencing actual spinoff activities such as to form companies and otherwise commercialize inventions in universities is the university setting that includes the university policies, the technology transfer office (TTO), the (entrepreneurial) cultural environment of the institution, and the presences of entrepreneurial role models; The external environment surroundings that include regional entrepreneurial networks and clusters, access to early stage financing sources, and access to early stage financing sources: and Lastly, the industry targeted.

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