COMPLEXITY DYNAMICS AND ENTREPRENEURIAL CREATIVITY- A GESTATION PROCESS PERSPECTIVE

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Abstract- During different stages of entrepreneurship process, entrepreneurs encounter challenges to adjust the development of gestation process to help development of entrepreneurial creativity. But most of us know very little about entrepreneurial creativity how to makes some startups' entrepreneurs more creative than anthers via different kind of gestation process. Therefore, this study attempts to discuss complexity dynamics of entrepreneurial creativity and theories as important determinants of entrepreneurial creativity at gestation process.

Keywords- Entrepreneurial Creativity, Complexity Dynamics, Gestation Process

I. INTRODUCTION

Entrepreneurial activity has been very active in the world, and entrepreneurship has become the important driving force for country's economic development over the past three decades, (Sternberg & Wennekers, 2005; Raposo & Do Paço, 2011). That is a change in the economy has been identified recently, moving from knowledge based activities to creativity, innovation, entrepreneurship and imagination (Van Den Broeck, Cools & Maenhout, 2008; Oke, Munshi & Walumbwa, 2009). The technology is rushing change of everyday. For example, Nikon, Kodak, and other famous names that once dominated photography are still struggling to adjust, laying off thousands of employees and replacing product lines. In place of film, new industries soon sprung up as digital cameras unleashed floods of photos and videos to populate Web 2.0 — Facebook, YouTube, blogs, wikis, and more sure to come(Halal, 2015). In practice, many firms have been foster creativity. Such as, 3M has employed this tactic and has enjoyed a steady flow of new products as a result. Google was hailed as the third most innovative business in the world by US magazine Fast Company (Marketing Week. 2012). Apple's phenomenal success- Steve Jobs and company have sold hundreds of millions of iPods, iPhones and iPads and billions of iTunes. Jobs set the tone and the culture at Apple. The creative ability to conceptualize and create value by transforming how we lead our lives, whether by using an iPod, iPhone or the iPad, is based on these aforementioned critical success factors (CSFs) (Barrett, Balloun & Weinstein, 2012).

Entrepreneurial is a complex set of interrelated organizing activities and nonlinear process (Liao, Welsch & Tan, 2005). That is to say, exploiting entrepreneurial opportunities depends on the entrepreneur's skills and capabilities, and this will have a bearing on the likelihood of successfully executing such complex activities. Fuller and Moran (2001) articulate a number of reasons why complexity science has value in small business and entrepreneurship research; it is developing as a post positivistic approach and has considerable resonance with the substantive field of enterprise. From prior research can found a higher degree of complexity in the gestation processes (Davidsson & Honig 2003; Hopp & Sonderegger, 2014). In the past, many studies have offered a framework to explore the characteristics of the firm gestation activities (e.g., Reynolds & Miller, 1992; Reynolds, 1997; Liao, Welsch & Tan, 2005). Overall, past research has studied: where studies have found the new ventures are likely to encounter in general stages of development; and activity-based models, these studies have examined frequency of occurrence and temporal sequencing of activities (Liao, Welsch & Tan, 2005). Hence, this study objective is further explaining gestation processes related to entrepreneurial creativity during entrepreneurial process. In the gestation processes included three factors: rate, concentration and timing. Consequently, this study looks forward to entrepreneurs to engage in different patterns of activities during the entrepreneurial gestation process, and the sequencing patterns of these activities will also differ.

II. THEORETICAL BACKGROUND AND HYPOTHESES

2.1 The nature of complexity dynamics

Dynamics is at the core of entrepreneurship. Starting from Schumpeter's (1934) definition of entrepreneurship as discontinuous change that destroys an economic equilibrium, researchers have explored the dynamics of entrepreneurship in terms of opportunity recognition (Sarasvathy, 2001; Shane & Venkataraman, 2000), corporate innovation and new product development (Van de Ven et al., 1999), organizational birth and evolution (Aldrich, 1999; Bhide, 2000), and the growth of new and small organizations (Greiner, 1972). While the emergence

of new firms has been studied extensively at the level of a market (Schoonhoven and Romanelli, 2000), it has been studied much more sparingly at the level of the firm, or the entrepreneur (Carter et al., 1996; Gartner, 1993; Katz and Gartner, 1988). The growing body of research from complexity science can provide a theoretical explanation for the emergence of new ventures.

2.2 Gestation Process

The creation of new organizations has increasingly become the focus of entrepreneurship research (Gartner, 1990; Oviatt & McDougall, 1994). Much of the existing research that explores the venture creation process has assumed a linear, unitary process, which begins with the recognition of a business opportunity and culminates with first sales and first hires. The linear model implies that an additive combination of events will lead to the creation of a new firm (e.g., Carter et al., 1996; Reynolds & Miller, 1992). The linear model has also been conceived as a stages model (e.g., Hansen & Bird, 1997). Yet, there is little empirical evidence that either validates or fails to validate the linear model.

Another typical approach for the study of venture creation process is to examine the activities, key milestones, the frequency and time frame of those activities. A few noteworthy empirical studies of venture creation process in this direction include Carter et al. (1996), Gatewood, Shaver and Gartner (1995) and Reynolds and Miller (1992). In their empirical study of a large sample of new firms in the States of Minnesota and Pennsylvania, Reynolds and Miller (1992) found substantial variations in the number of events reported, the sequence of events, and the amount of time between events. As the number of gestation activities increase (i.e., commitment of personal time and resources, receipt of outside financial support, hiring of employees, and first sales), the probability that the nascent entrepreneur will fail to establish a new firm tends to decrease. By studying the patterns of nascent entrepreneurial activities, and in particular the timing of activities rather than their sequence, they find that the speed of carrying out organizing activities (rate), the extent to which these activities are spread out systematically (concentration), and the concentration of activities in later stages of the founding process (timing), all have a positive impact on the likelihood of new venture creation. Hence, they argue that the design of the entrepreneurial process determines the probability of successful venture creation. Lichtenstein, Carter, Dooley and Gartner, (2007, p. 255) use the following metaphor to illustrate the implications of their findings and methodology: “The most effective way to get a bicycle moving is to use high force (fast rate) on the pedal, with a consistent, unvarying effort (low temporal concentration). In so doing you start slow and then your momentum increases (late timing).”

2.2.1 The temporal “rate” of gestation process

The first dimension describing the process of venture creation concerns the speed or pace of organizing activities. One of the key stumbling blocks of young start-ups is the difficulty of acquiring legitimacy from external stakeholders such as outside financiers and customers (Aldrich, 1999). In complexity science “adaptive tension” is very important idea related to the begging of gestation process (McKelvey, 2004). Adaptive tension is a theoretical explanation for why some emergence processes occur at a faster rate than others. Adaptive tension occurs whenever an energy differential arises in a system, generating a disequilibrium which inherently seeks to be dissipated (Meyer et al., 2005); the greater the disequilibrium, the greater the rate of its dissipation, all other things being equal (Prigogine and Stengers, 1984). Technically, the high tension state of the enclosing (economic) system is reduced by the emergence of smaller intra-systems, i.e. entrepreneurial ventures (Foster, 2000), which emerge to reduce the tension between demand and supply in one area of the economy (Binks and Vale, 1990). Slevin and Covin (1997:56) recognize this temporal process by suggesting that “successful entrepreneurial firms act as energy conversion systems.”

Shane and Delmar (2004) analyzed the timing of activities and found that firms that concentrate on legitimizing activities first have higher chances of survival. A higher rate of activities, that is, entrepreneurs completing more tasks within a shorter period of time, means a faster gestation process, and increases the likelihood of venture emergence. Rapid gestation speaks for the venture’s legitimacy to stakeholders. Accordingly, carrying out organizing activities faster should help ventures to be successful. So we can know, when the early stage development rate is faster that will enhance better entrepreneurial creativity foster. Conversely, the later stage develop slower will enhance better opportunity to adjust entrepreneurial creativity during development. Formally:

> H1: The rate by which startups activities will have significantly positive effect on entrepreneurial creativity in the entrepreneurial seed stage; otherwise, The rate by which startups activities will have significantly negative effect on entrepreneurial creativity in the entrepreneurial growth stage.

2.2.2 The temporal “concentration” of gestation process

In addition to the pure pace of carrying out the organizing activities, the concentration of organizing activities during the gestation process of a new business also influences the likelihood of successful foundation. The high failure rates in mastering organizing activities document how difficult the timely and adequate provision of attention and commitment is. Instead, an emerging organization

must find the balance between order and disorder that is often called "the edge of chaos." At this point of dynamic tension, truly novel emergent behavior can occur. (Lewin, Long, & Carroll, 1999). Researchers who have explored this "edge of chaos" have found that in some contexts like innovation, the components of the system have intrinsically high levels of interaction. These complexity researchers have therefore found that limiting the concentration of interactions between components of an innovation can significantly improve the quality of the result (Fleming and Sorenson, 2001). Evidence suggests that high interactivities are associated with larger cognitive loads that inhibit learning and subsequently lead to worse performance (Sweller 1994, 2006). The entrepreneurs' lower concentrate during early stage that will boots entrepreneurial creativity foster better. Conversely, entrepreneurs' higher concentrate during later stage that will boots entrepreneurial creativity adjust and develop better. This leads to the following hypothesis:

> H2: The concentration by which startups activities will have significantly negative effect on entrepreneurial creativity in the entrepreneurial seed stage; otherwise, the concentration by which startups activities will have significantly positive effect on entrepreneurial creativity in the entrepreneurial growth stage.

2.2.3 The temporal "timing" of gestation process

Recent evidence highlights the amount of effort nascent entrepreneurs put into the completion of organizing tasks. Substantial tenacity and perseverance are necessary to bring the effort to fruition. Initially, great efforts might yield low benefits, though later in the process, the accumulation of activities might bear fruit. The process of entrepreneurial activities is driven by positive feedback processes (Lichtenstein, Dooley, and Lumpkin 2006). That is, in the early stages of organizing a new venture, a great deal of effort may yield few tangible results; however as more of the " scaffold of emergence " is developed through the completion of organizing activities, it becomes increasingly likely that more organizing activities will then come to fruition. By that logic we would expect that when more organizing activities are completed later in the process those efforts would be more likely to result in entrepreneurial creativity, and, the positive effects of this accelerating dynamic are not dependent on the content nor on the context of those organizing activities, but purely on the timing of the activities within the event history. In formal terms:

> H3: The timing by which startups activities will have significantly negative effect on entrepreneurial creativity in the entrepreneurial seed stage; otherwise, the timing by which startups activities will have significantly positive effect on entrepreneurial creativity in the entrepreneurial growth stage.

3 Research contributions

This study will make contributions to the theory building and practical implementation in the strategy, marketing, financial and entrepreneurship literature. Understanding startups entrepreneurial process will help to clarify each stage characteristics and promote entrepreneurial creativity foster. But former studies have various classifications with startup stage (e.g., Van Gelderen, Thurik, and Bosma, 2006). Low and MacMillan (1988) point out most of the studies that focus on stage in the start-up an enterprise are variations on study theme. Short time frame studies are simple to design and easier to execute but clearly lack the richness on insight that results from studying a phenomenon over a longer time period. In general, each study is non-compliance and can't be generated for comparative. Hite and Hesterly (2001) point out each entrepreneurial process stage represents a unique, strategic context that influences the nature and extent of a firm's external resource needs and resource acquisition challenges. Therefore, only wide time frame studies will allow us to study the development problems faced by new firms and to pursue the objective of causal inference. That's meaning each stage will face different problems and these external factors or entrepreneurs' behaviors will vary over time.

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