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Master Thesis in Engineering

**Dynamic capabilities for venture
innovation: a microfoundation
study of technology-based
entrepreneurs**

벤처 기업의 혁신을 위한 동적 역량:

기술 기반 사업가에 대한 미시적 접근

August 2018

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**Dynamic capabilities for venture innovation:
a microfoundation study of technology-based
entrepreneurs**

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이 논문을 공학석사 학위 논문으로 제출함

2018 년 8 월

서울대학교 대학원

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Abstract

Dynamic capabilities for venture innovation: a microfoundation study of technology-based entrepreneurs

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Dynamic capabilities have long been considered essential organizational features enabling firms to sense, seize and reconfigure assets in order to obtain competitive advantage and achieve innovation. However, in the context of entrepreneurship, dynamic capabilities have not been sufficiently studied. This study bridges the gap by looking into individual characteristics of technology-based entrepreneurs that can provide microfoundations of dynamic capabilities

necessary for new venture innovation. The study considers entrepreneurs' pre-venture experience, the level of commitment, risk-taking propensity, type of motivation and problem-solving skills as important characteristics giving entrepreneurs' ability to sense, seize and reconfigure entrepreneurial opportunities, and empirically examines their impact on new venture innovation in the context of technology-based nascent entrepreneurs in the U.S. The findings suggest that prior industry experience plays an important role in enabling the identification of new opportunities, while intrinsic motivation is essential for its successful reconfiguration.

Keywords: Dynamic capabilities, Entrepreneurship, Pre-venture experience, Motivation, Innovation, PSED

Student Number: 2016-26925

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Chapter 1. Introduction

In the recent years, there has been a significant increase in the number of studies examining entrepreneurs, their characteristics, and the features of their businesses. This is so because entrepreneurs are an important source of innovation, job opportunities, improved productivity, as well as an important contributor to the economy (Reynolds, 2007). According to the Global Entrepreneurship Monitor (2017), nearly 14%, or 27 million, of the working age population in the U.S. are starting or operating new businesses in 2017. Thus, having an insight into how startups are created and developed can lead to very useful policy implications for improving the economy and the business environment (Schramm, 2006). There are various studies that examine innovation and entrepreneurship in general (e.g., Schumpeter, 2000; Veeraraghavan, 2009; Zhao, 2005), but due to the versatility of individuals that engage in entrepreneurship there is little consensus as to what makes entrepreneurs innovative or not (Hyytinen, Pajarinen, & Rouvinen, 2015).

There are several important reasons why studying entrepreneurship can provide interesting conclusions that are different than those inferred from studying established businesses. First, mindset of an entrepreneur is as important for the success of the business, as his/her knowledge and abilities. Second, dynamics in

the entire business process and development is different due to subjective and uncertain nature of entrepreneurship (Dimov, 2010). Finally, the venture in question cannot be separated from the individual entrepreneur that is behind it and his perceptions and beliefs (Dimov, 2007). This implies that in order to study the development process of startups and their subsequent success, failure, or impact we need to take into account individual characteristics and experiences of the entrepreneurs that start those startups due to the inherent connection of the two.

This study aims to shed the light on what are the individual characteristics of entrepreneurs that allow them to enhance their dynamic capabilities necessary for innovation in the context of nascent technology-based ventures. Building on prior studies that bring dynamic capabilities to the individual level and look at their microfoundations (e.g., Helfat & Peteraf, 2015; Rodenbach & Brettel, 2012) this study uncovers personal characteristic of entrepreneurs that enhance dynamic capabilities necessary for new venture innovation. Dynamic capabilities have been extensively studied in the context of established firms (Eisenhardt & Martin, 2000; Griffith & Harvey, 2001; Winter, 2003; Zahra & George, 2002) but less so in relation to young firms or startups (Zahra, Sapienza, & Davidsson, 2006). Previous research does confirm that startups need different types of dynamic capabilities than established companies (Zahra et al., 2006) and rather than referring to capabilities stemming from organizational structure and assets, in startups they reside in the individuals constituting the founding/entrepreneurial

team (Boccardelli & Magnusson, 2006). In the case of startups, dynamic capabilities play an equally important role as for the established companies, in this case allowing them to persist, achieve credibility and ultimately make good use of their innovation (Sapienza, Autio, George, & Zahra, 2006). However, prior research on dynamic capabilities hasn't yet examined what are the individual characteristics that enhance the dynamic capabilities that are essential for innovation in entrepreneurship, which this study aims to do. Particularly, this study focuses on those characteristics necessary to effectively sense, seize and reconfigure assets and knowledge in startups. It links the personal characteristics, i.e. entrepreneurs' previous experience, commitment, risk-taking propensity, motivation and problem-solving ability to each of the components of the dynamic capabilities and suggests them as microfoundations of dynamic capabilities in entrepreneurship, which, in turn, affects the new venture innovation.

In order to analyze the effects on innovation, this study focuses on technology-based nascent entrepreneurs. This specific context is chosen for several reasons. First, technology-based entrepreneurs tend to operate in an environment that is more competitive, innovative with shorter cycles of both product development and business cycles (Ali Abdul, Krapfel Robert, & LaBahn Douglas, 2003). They also tend to generate higher expectations, both in terms of the outcomes and the impact of the venture (Shane, 2003) and offer higher novelty than other ventures (Byers, Dorf, & Nelson, 2014; Cooper, 1971). Finally,

technology-based entrepreneurs tend to have less established routines which increases the uncertainty of the venture success (Venkataraman, 2004). This kind of environment is more dynamic and unpredictable, and, due to that, innovation plays an important role for survival, making it a fitting context for examining characteristic necessary for innovation. Particularly, as previous research shows, dynamic capabilities tend to be most valuable when the external environment is unpredictable and prone to rapid changes (Zahra et al., 2006).

The empirical part of this research is based on the data from the Panel Study of Entrepreneurial Dynamics (PSED II). The final dataset used in this research includes individual level data from the founders of 284 technology-based startups. The findings of the study confirm that previous industry experience is important for all three aspects of dynamic capabilities leading to new venture innovation. Furthermore, they confirm that intrinsic motivation is essential for successful innovation in technology-based ventures. In general, the results show that intrinsically motivated entrepreneurs with the industry experience would be more innovative than those extrinsically motivated, or with extensive entrepreneurial experience.

This study contributes to the theory of dynamic capabilities as one of the few studies testing its propositions empirically. It also contributes to the theory of antecedents of entrepreneurial innovation. In addition to that, this research clarifies the role of individual characteristics in enabling sensing, seizing and

reconfiguring dynamic capabilities. It can also provide some guidance to policymakers and investors when deciding in what type of entrepreneurs should their their resources be invested.

The rest of the study proceeds as follows. Chapter 2 lays out the theoretical basis, and provides extensive literature review based on which 6 hypotheses are proposed. Chapter 3 provides information about the dataset, variables and methodology. Chapter 4 examines the results of the empirical analysis, and Chapter 5 provides the discussion and the conclusion of the research.

Chapter 2. Theory and Hypotheses

2.1 Dynamic capabilities

Dynamic capabilities framework analyzes the sources of wealth creation and competitive advantage in fast-changing environments (Teece, Pisano, & Shuen, 1997). According to that seminal study by Teece et al., dynamic capabilities refer to the firm's ability to incorporate, develop and reconfigure internal and external competencies necessary for the firm's success. Their framework identifies competitive advantage of firms as lying with its managerial and organizational processes, shaped by its asset positions, and the paths available to it. Most of the following research sees dynamic capabilities as something stemming from firms' organizational structure, processes and positions (Eisenhardt & Martin, 2000; Griffith & Harvey, 2001; Winter, 2003; Zahra & George, 2002). However, there is an emerging research stream that looks at the microfoundations of dynamic capabilities and how individuals, in particular top managers or founders, can also contribute to the dynamic capabilities of the firm (e.g., Helfat & Peteraf, 2015; Rodenbach & Brettel, 2012). When discussing the microfoundations of the dynamic capabilities, Teece (2007) classified them into: 1) capabilities enabling

sensing and framing both opportunities and threats; 2) capabilities enabling seizing the opportunities; and 3) capabilities enabling enhancing, combining and reconfiguring firms' both tangible and intangible assets. Helfat & Peteraf (2015) build on this framework but instead of organizational level capabilities as in the case of Teece (2007) they apply the framework to individual level capabilities of top managers, that they define as managerial cognitive capabilities. Similar to their research, this study wants to apply the dynamic capabilities framework to the individual level, but to the case of nascent entrepreneurs, focusing on founder/s' general personal characteristics, rather than just cognitive abilities.

2.1.1 Dynamic capabilities and entrepreneurship

There is previous evidence that established firms and young startups have different learning processes and that young startups would require different types of dynamic capabilities than established organizations (Zahra et al., 2006). Unlike established firms, not many entrepreneurs will possess enough resources to establish a successful business and they will need various complementary assets that call upon dynamic capabilities (Newbert, 2005).

Previous research confirms that dynamic capabilities exist already at the offset of a venture (Boccardelli & Magnusson, 2006). However, at the initial stages of the venture, organizational principles haven't yet developed (Kogut & Zander, 1992), and therefore dynamic capabilities reside primarily in the few individuals comprising the founding team rather than throughout the organization (Boccardelli & Magnusson, 2006). In the case of entrepreneurship, dynamic capabilities develop in response to many different factors, not just related to the rate and instability of firms' external environment (Jiao, Alon, & Cui, 2011) but also internal pressures towards change (Zahra et al., 2006).

In the case of entrepreneurs, creation, development and consequent use of dynamic capabilities is explained largely by the way founders perceive new opportunities, their ability to change their routines and approaches, their willingness to initiate such changes and the ability to implement them (Zahra et al., 2006). These abilities are mostly determined by experience, skills and motivation of the key managers in established companies (Penrose, 1959), or in the case of startups, the experiences and motivation of founders or the entrepreneurial team. Prior entrepreneurship literature also confirms that dynamic capabilities are valuable for new venture creation and evolution (Newbert, 2005), as well as successful market entry and startup survival (Sapienza et al., 2006).

Despite the fact that previous research shows that dynamic capabilities are as important for new ventures as they are for established firms, as well as the

fact that startups would require different kinds of dynamic capabilities, empirical research examining dynamic capabilities in the context of entrepreneurship is still lacking. Therefore, this study aims to bridge the gap, first, by formulating a framework based on entrepreneurs' personal characteristics enabling dynamic capabilities necessary for innovation, and second, by empirically testing it in the context of technology-based nascent entrepreneurs.

2.1.2 Sensing

These type of capabilities are mostly directed at detection or sensing of new opportunities. They are those related to scanning, learning, and interpreting activities (Teece, 2007) that enable individuals to identify new opportunities but also recognize threats and obstacles (Helfat & Peteraf, 2015). In the context of established firms, sensing often involves research & development activities, scanning for new leads across markets, and understanding the demand (Teece, 2007). In the case of entrepreneurship, however, it is more likely that it will involve the knowledge and relationships of the entrepreneur (Cassar, 2014). Sensing new opportunities can be particularly important, because the identification of the initial opportunity dictates the subsequent actions of entrepreneurs (Samuelsson & Davidsson, 2009) and can be particularly important in competitive and uncertain environments.

2.1.3 Seizing

Seizing capabilities are those enabling addressing opportunities – turning them from an idea into a product or an output. In terms of established companies, such capabilities involve improving technological competencies and complementary assets that enable both quality of the product and market positioning (Teece, 2007). In terms of entrepreneurs, however, the situation is different. They likely won't have many initial resources that they can improve, rather they will need to take chances, improvise and work hard in order to bring their idea to fruition (De Clercq, Menzies, Diochon, & Gasse, 2009; Zahra et al., 2006). Therefore, the characteristics that could enhance seizing capabilities are likely to be those that enable entrepreneurs to be flexible, daring but also committed to their venture.

2.1.4 Reconfiguring

Capabilities related to reconfiguration enable the organizations to sustain competitive advantage, avoid burdensome path dependencies and allow for growth and evolution. In established companies, these capabilities are reflected in management decentralization, redesign of routines, redeployment and productive exchange within the enterprise (Teece, 2007). Startups, however, tend to work at a much smaller scale, and the reconfiguration capabilities will mostly be reflected in the features enabling entrepreneurs to be creative, flexible and adaptable (Zahra et al., 2006; J. Zhou, 2015). Thus, characteristics enabling cognitive flexibility and creativity should be examined.

2.2 Previous Experience

Previous experience of the entrepreneur has been found to have a significant effect on the entire business process and the ultimate success and failure of the venture. Prior experience affects the tacit and implicit knowledge, skills and attitudes of the founder/s, which in turn affects their decisions, expectations for the success of the venture, and efforts invested during the entrepreneurial process (Olugbola, 2017). If transferable, previous experience can be utilized to facilitate the new venture goals, as well as influence the strategic choices founders make, and ultimately impact the innovation of the venture (Behrens, Ernst, & Shepherd, 2013; Davidsson & Honig, 2003; Rodenbach & Brettel, 2012). Kirzner (1997) describes entrepreneurial activity as a processes of discovering facts, where experience improves discovery, and helps identify and develop new business opportunities. Entrepreneurs gain important insight from work and entrepreneurial experiences that can be utilized in their entrepreneurial activities, thereby improving entrepreneurial judgment (Baron & Ensley, 2006; Corbett, 2005; Parker, 2006). Thus, entrepreneurs' prior experiences, i.e., industry experience and entrepreneurial experience, can be essential factors facilitating dynamic capabilities necessary for new firm innovation.

2.2.1 Industry experience

Industry experience has been found to have a direct and significant affect on business performance in a number of settings (Colombo & Grilli, 2005; Jung & Weber, 2015; Lerner, Brush, & Hisrich, 1997; Stuart & Abetti, 1990; Tyebjee & Bruno, 1984). This is so because previous industry experience ensures that the entrepreneur would have necessary information about industry rules and norms, as well as possible intricacies related to doing business in the industry; supplier, consumer and competitor networks and their preferences; and it increases the credibility of the business.

Entrepreneurs with the previous experience in the same industry the new business will operate in have better information and a greater understanding of the environment (Hayek, 2002) that is fundamental for overcoming the hurdles associated with the new business development. This kind of familiarity would in turn reduce the uncertainty the business faces (Dimov, 2010) and result in better identification, as well as reconfiguration of new opportunities. It will also affect the way entrepreneurs navigate the environment, as well as develop abilities to successfully operate in a new market niche (Helfat, 1997).

Prior industry experience also helps establish relationships with other stakeholders in the industry, such as consumers, suppliers, distributors etc. (Chandler, 1996; Delmar & Shane, 2006) and the resulting network can be an

important asset in sensing, seizing and reconfiguring new opportunities in the industry. Relationships with other stakeholders can be an important source of precise and relevant information and knowledge related to many aspects of the business, including new product developments, trends, pricing structure, possible profitable new segments and others (Brüderl, Preisendörfer, & Ziegler, 1992; Dimov, 2010; Landier & Thesmar, 2009).

Previous industry experience affects not only explicit knowledge of the industry and relationships with other stakeholders, but also a wide range of tacit abilities, such as perception, deduction and ability to interact with others (Ardichvili, Cardozo, & Ray, 2003) that are necessary for all three types of dynamic capabilities. Therefore, entrepreneur can benefit both from the explicit experience in the industry, but also from the dynamic abilities this experience provides (King & Tucci, 2002).

For these reasons, this study suggests that previous industry experience will have a significant impact on new venture innovation, by allowing the entrepreneurs' to better sense and assess new opportunities, to know the best way to seize them, and to have a network that can help in reconfiguring them, and proposes:

H1: Previous industry experience will be positively related to new venture innovation.

2.2.2 Entrepreneurial experience

While industry experience is important for specific skills and knowledge related to the product and the industry the business would operate in, entrepreneurial experience is important source of knowledge about business creation and entrepreneurial processes generated from learning by doing (Colombo & Grilli, 2005; Corbett, 2005). Due to the differences in the business development processes, experience stemming from previous attempts at entrepreneurship can be a valuable factor that can improve assessment of new opportunities, and improve entrepreneurs' forecasting ability (Cassar, 2014).

Learning and knowledge gained from attempts to start a new business, whether successful or not, can be a very important tool in navigating the environment technology-based ventures would compete in. This is so because entrepreneurial experience improves entrepreneurial judgment and evaluation of new opportunities (Colombo & Grilli, 2005) and learning by doing stemming from this experience can help develop a strong cognitive framework that improves evaluation and selection of entrepreneurial opportunities (Baron & Ensley, 2006), that can be essential for both sensing and reconfiguration.

In addition to that, learning from unsuccessful attempts and reflecting on their past entrepreneurial activities can improve entrepreneurs' accuracy in

evaluating new business opportunities (Parker, 2006; Shane, 2003). This kind of experience also impacts the cognitive bias associated with the assessment of new opportunities (Cassar, 2014). Experienced entrepreneurs are more aware of the risks associated with starting new businesses (Hayward, Shepherd, & Griffin, 2006) and this can result in reduction of overoptimism cases (Hmieleski & Baron, 2009) and result in more effective seizing of new opportunities.

For these reasons, this research further suggests that previous entrepreneurial experience will also have a significant impact on new venture innovation, by enhancing all three types of dynamic capabilities , and proposes:

H2: Previous entrepreneurial experience will be positively related to new venture innovation.

2.3 Risk-taking Propensity

At the initial stages of startup development, entrepreneurs are more likely to turn to improvisation when facing difficulties (Zahra et al., 2006). The reason for this being that entrepreneurs tend not to possess slack resources that would enable them to plan their actions or try out different approaches prior to deciding on a single one (Delmar & Shane, 2006). In general, it is likely that they will face a lot

of unexpected situations that would pressure them to improvise and take risks. Additionally, in order to develop new products that are based on technological innovation entrepreneurs usually need to take risks as they cannot predict the demand and success of the new product (Naldi, Nordqvist, Sjöberg, & Wiklund, 2007).

Risk-taking propensity is an important characteristic of entrepreneurs, and is generally positively related to pro-activeness and innovation (Naldi et al., 2007), that can be useful for both seizing and reconfiguration capabilities. In the opposite case, if entrepreneurs are risk averse, they are less likely to explore innovation, as their decision-making process can be biased (Teece, 2007). Attitudes towards risk-taking will have a significant impact on how entrepreneurs engage in different activities that are perceived as uncertain (Keh, Foo, & Lim, 2002) and risk-taking propensity and perception will tend to drive entrepreneurial activities (Forlani & Mullins, 2000).

Entrepreneurs' risk-taking propensity has further been found to have a greater effect at choosing which opportunities to pursue than expected returns of alternative opportunities or their characteristics (Forlani & Mullins, 2000). Research also shows that risk-taking propensity of an entrepreneur also strongly affects the way they perceive risk when engaging in new venture development, which in turn affects the choices they make (Sitkin & Weingart, 1995). Entrepreneurs with greater risk-taking propensity naturally tend to chose more

riskier ventures (Sitkin & Pablo, 1992) which is important in the context of this study, considering that technology-based ventures tend to be riskier than non-technology ones. Risk-taking propensity can, thus, have a significant impact on all aspects of the venture development, and be a microfoundation for all three types of dynamic capabilities.

Thus, this study includes risk-taking propensity of an entrepreneur as one of the basis of dynamic capabilities necessary for new venture innovation, and proposes the following hypothesis:

H3: Risk-taking propensity will be positively related to new venture innovation.

2.4 Entrepreneurial Commitment

In general research, commitment usually refers to the dedication invested in a particular organization or an activity (Avolio, Zhu, Koh, & Bhatia, 2004). In the context of entrepreneurship research, one of the key influences on the outcome of entrepreneurial activity has been found to be the commitment invested in reaching their objective of establishing a successful business (e.g., Carter, Gartner, & Reynolds, 1996; De Clercq et al., 2009; Krueger, 1993). Entrepreneurial commitment can be an influential personal characteristic that impacts new venture

innovation and seizing the opportunities because it results from a combination of entrepreneurs' intention to pursue a certain goal and entrepreneurs' persistence in achieving it (De Clercq et al., 2009).

Entrepreneurial commitment influences the level of effort entrepreneurs are willing to invest when undertaking startup activities. Townsend, Busenitz, & Arthurs (2010) analysis shows that the greater the level of commitment, the greater the probability that the entrepreneur will achieve specific milestones within a short period, gather momentum, and not get involved in too many activities at once. In addition to that, entrepreneurial commitment is a reflection of a capability to see a venture through to completion (Erikson, 2002).

Entrepreneurs exhibiting greater levels of commitment also tend to be more successful in dealing with challenges (Hopp & Sonderegger, 2015) which is an important aspect of new venture innovation. This is compatible with the goal setting theory, where goals incentivize entrepreneurs to work harder and invest more effort, that ultimately results in better performance (Locke & Latham, 2002). This translates to – the greater the entrepreneurial commitment of founders, the more successful they would be at achieving their goals (Hopp & Sonderegger, 2015). Entrepreneurial commitment has also been found to be predictive of progress in startup development (Carsrud & Brännback, 2010; Cassar & Friedman, 2009).

Therefore, this study takes into account entrepreneurial commitment, both as

an important factor for seizing and reconfiguring entrepreneurial opportunities, but also as a factor that can balance out potential uncertainties associated with risk-taking. The following hypothesis is proposed:

H4: Entrepreneurial commitment will be positively related to new venture innovation.

2.5 Motivation

Motivation has been another factor deemed critical in understanding the complete entrepreneurial process (Kuratko, Hornsby, & Naffziger, 1997) and has been identified as having a strong influence on individual behavior (Herron & Robinson, 1993), which in turn affects innovation and performance of a venture. Depending on the type of motivation, entrepreneurs' expectations, commitment and the level of satisfaction differ, leading to a different utilization of prior experience. Motivation directly affects the form, intensity, direction, and duration of individual behavior (Meyer, Becker, & Vandenberghe, 2004). Therefore, it is reasonable to assume that motivation will impact the way entrepreneurs access, use and reconfigure their resources in order to innovate, and the intensity of those efforts. In addition, research on what motivates different types of entrepreneurs

and how internal and external motivation interact with different aspects of the entrepreneurial process is still lacking (Carsrud & Brännback, 2010). In this research, we distinguish between intrinsic motivation, which represents a personal interest in the entrepreneurial task (such as a desire for personal growth and a sense of achievement), and extrinsic motivation, which represents an external reward resulting from a certain behavior (such as job security, or a good salary) (Mitchell, Mitchell, & Randolph-Seng, 2014). In entrepreneurship research, it has been found that intrinsic motivation can have a significant impact on a number of points, reinforcing creativity, commitment, problem-solving and passion, when engaging in entrepreneurial activities (Deci & Ryan, 2000; Dysvik & Kuvaas, 2008; Gagné & Deci, 2005; Wang, Lu, & Sun, 2018). Therefore, this study aims to further examine whether individual motivation, particularly intrinsic motivation, could impact the way entrepreneurs' develop their business, and therefore impact new venture innovation.

2.5.1 Intrinsic Motivation

Intrinsic motivation represents personal interest in the entrepreneurial task. This kind of motivation is usually rooted in the work itself and comes from the satisfaction and the sense of achievement, and the fact that the individuals perceive their work as interesting or challenging (De Spiegelaere, Van Gyes, & Van Hootegem, 2013). When intrinsically motivated, entrepreneurs get a sense of accomplishment and happiness from their work that further motivates them to invest more effort (Kuratko et al., 1997). Research also shows that once entrepreneurs experienced starting a new venture, they are more likely to try again due to the intrinsic motivation they experienced (Carsrud, Brännback, Elfving, & Brandt, 2009).

Previous research shows that intrinsically motivated entrepreneurs' have increased levels of creativity and persistence and similar positive behavior than the extrinsically motivated individuals (Gagné & Deci, 2005; X. Zhang & Bartol, 2010). Particularly, they exhibited better effective performance, especially in relation to tasks that require increased conceptual understanding and cognitive flexibility (Gagné & Deci, 2005). In addition to that, intrinsically motivated entrepreneurs tend to be more curious and flexible in addition to having an internal drive that optimizes their work processes (Baer, Oldham, & Cummings, 2003; Shalley & Gilson, 2004). This kind of curiosity and cognitive flexibility

facilitated by intrinsic motivation can be an important factor enhancing both seizing and reconfiguration capabilities.

By persisting when they face complications, intrinsically motivated entrepreneurs also tend to be more successful at leveraging knowledge-related benefits necessary for reconfiguration and adaptation to the challenging and changing conditions (Q. Zhou, Hirst, & Shipton, 2012). According to Wang et al., (2018) they also tend to have improved contextual performance that enables knowledge transfer and sharing, crucial for successful innovation.

In general, intrinsically motivated individual will be more invested and persistent in their work (Dysvik & Kuvaas, 2011) and more involved in their jobs (Gagné & Deci, 2005), thus indicating that they will be more determined to find novel ways to apply their assets than their extrinsically motivated counterparts.

Therefore, this research suggests that intrinsic motivation will be one of the significant factors necessary for seizing and reconfiguration capabilities, and propose:

H5: Entrepreneur's intrinsic motivation will be positively related to new venture innovation.

2.6 Problem-solving Ability

Cognitive flexibility and problem-solving skills are of essential importance for the success of entrepreneurial ventures. These characteristics will determine the way entrepreneurs approach and resolve difficulties, and can be particularly important when engaging with innovative activities involving uncertainty. Effective entrepreneurs have the ability to first, identify valuable problems requiring solution, and second, organize and act in a way that finds appropriate solutions (Hsieh, Nickerson, & Zenger, 2007).

Problem-solving ability of an entrepreneur will affect the tendency of initiating multiple efforts at a certain task and will also affect the choices they make when allocating their effort among different business activities (Buttner & Gyskiewicz, 1993). Through entrepreneurial problem-solving, issues that represent obstacles for innovative activities can be turned into an advantage (Hugo & Garnsey, 2005). In addition to that, Hugo and Garsney show that problem-solving ability of an entrepreneur facilitates exploratory behavior and experimentation and learning, all characteristics necessary for establishing both seizing and reconfiguring capabilities. Effectively seizing new opportunities often entails design and development of successful business models, and problem-solving ability has been found to be an essential factor that enables their effective design (Zott & Amit, 2007).

In order to successfully solve problems, entrepreneurs are prompted to seek new information and knowledge leading to inventive solutions (Q. Zhou et al., 2012). Problem-solving solving also requires interactive behavior and strategic interaction with others (Hugo & Garnsey, 2005). Problem-solving ability in entrepreneurs further entails intuitive approaches to processing information, including open-ended attempts at solving a problem and exploring unusual solutions (Allinson, Chell, & Hayes, 2000). Therefore, problem-solving ability can be important when sensing and evaluating new opportunities as well as when finding a way to reconfigure existing ones. All this indicates that entrepreneurs with greater problem-solving abilities will be more able to engage in activities necessary for effective innovation.

Finally, previous research confirms that recurrent problem-solving in early stages of development enabled technology-based firms to build dynamic capabilities on a cumulative basis (Hugo & Garnsey, 2005). Due to all this, this study suggest that problem-solving ability will be one of the necessary foundations for dynamic capabilities necessary in new ventures, and proposes:

H6: Entrepreneur's problem-solving abilities will be positively related to new venture innovation.

Table 1. Overview of the theoretical arguments

| | SENSING | SEIZING | RECONFIGURING |
|----------------------------|---|---|--|
| INDUSTRY EXPERIENCE | <ul style="list-style-type: none"> • Information about industry rules and norms • Relationships with other stakeholders | <ul style="list-style-type: none"> • Relationships with other stakeholders • Perception, deduction and ability to interact with others • Increases (financial) credibility | <ul style="list-style-type: none"> • Relationships with other stakeholders |
| ENTREPRENEURIAL EXPERIENCE | <ul style="list-style-type: none"> • Learning by doing improves assessment of new opportunities • Improves entrepreneurial judgment • Reduces cognitive bias | <ul style="list-style-type: none"> • Reduces overoptimism cases and improves risk assessment | <ul style="list-style-type: none"> • Learning by doing enables them to know how to adapt their approach |
| RISK-TAKING PROPENSITY | <ul style="list-style-type: none"> • Affects which opportunities to pursue | <ul style="list-style-type: none"> • Necessary due to lack of resources • Enables pro-activeness and innovation | <ul style="list-style-type: none"> • Enables pro-activeness and innovation |
| ENTREPRENEURIAL COMMITMENT | | <ul style="list-style-type: none"> • Reflects persistence • More successful in dealing with challenges • Predictive of progress | <ul style="list-style-type: none"> • More successful in dealing with challenges |
| INTRINSIC MOTIVATION | | <ul style="list-style-type: none"> • Improved contextual performance affecting knowledge transfer • More invested and persistent • Improves effective performance | <ul style="list-style-type: none"> • More creativity and commitment • Motivated to do more and improve • Curiosity and flexibility |
| PROBLEM-SOLVING | <ul style="list-style-type: none"> • Facilitates exploratory behavior • Initiates seeking of new information | <ul style="list-style-type: none"> • Necessary for deciding on and designing a business model | <ul style="list-style-type: none"> • Affects the tendency to initiate multiple efforts • Facilitates exploratory behavior • Exploring unusual solutions |

Table 1 represents an overview of the reasoning as to why or in what way would each of the chosen characteristics affect each of the types of the dynamic capabilities in entrepreneurs. Figure 1 below represents a conceptual diagram of the proposed hypotheses.

Conceptual diagram

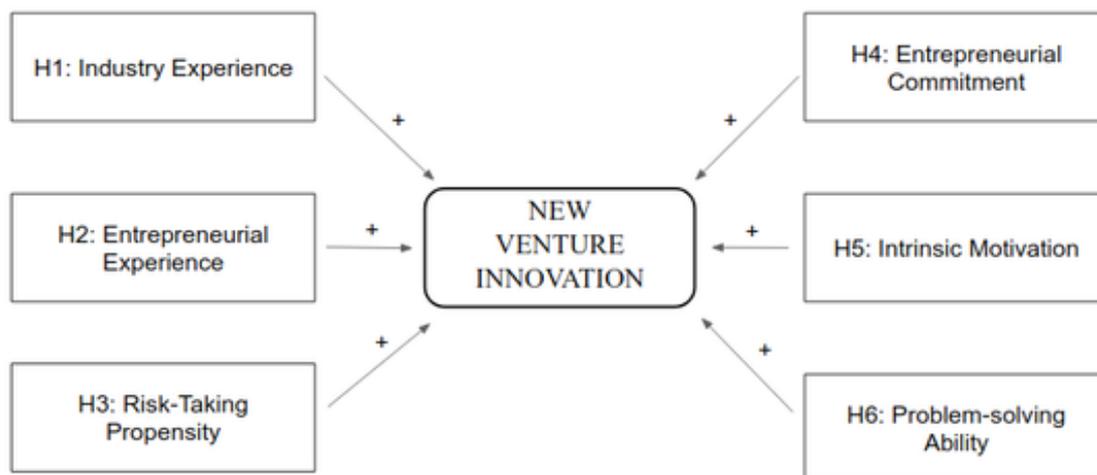


Figure 1. Conceptual diagram of the hypotheses

Chapter 3. Data and Methodology

3.1 Data specification

This study gathers data from the University of Michigan's "Panel Study of Entrepreneurial Dynamics II" (PSED II). Data from this survey is representative of entrepreneurial activities of U.S. entrepreneurs, starting from the very beginning of organizing activities, and following up on the business development activities in five consecutive surveys done a year apart. The PSED II is a longitudinal dataset, that represents a very unique and comprehensive insight into early stages of entrepreneurial processes (Reynolds & Curtin, 2008). The authors of the survey conducted a randomized screening interviews of 31,845 adults in order to identify 1,214 entrepreneurs that are about to start their new venture, and then interviewed them about their activities yearly, in the following 6 years, from 2006 to 2012 (Reynolds & Curtin, 2009).

The two initial screening questions used to identify nascent entrepreneurs were: 1) Are you, alone or with others, now trying to start a new business or starting a new business for your employer? (2) Are you, alone or with others, now starting a new business or new venture for your employer as effort that is part of

your job assignment? (Reynolds & Curtin, 2009). If responded positively to one of these questions, individuals were considered candidates for the comprehensive interview if they satisfy the following three criteria: “recent start-up behavior, expectations of ownership, and no evidence of a going business”¹ The following interviews include a wide range of items, including “opportunity recognition, entrepreneurial climate, start-up problems, start-up context, reasons for starting a new venture, as well as nascent entrepreneurs’ demographics, background, and personal dispositions.”²

This data is chosen due to its comprehensiveness, considering that includes not only information about specific activities, but also information about motivation, attitudes, perceptions and other personal characteristics of the founder/s, as well as the environment the business will operate in. For this study, we focus only on 284 technology-based entrepreneurs. The selection is done according to the entrepreneurs’ response to the question “Would you consider this new business to be hi-tech?”.

¹Reynolds & Curtin, 2008

²Liao & Welsch, 2003

3.2 Variables

3.2.1 Dependent variable

New Venture Innovation – For the construction of this variable this study follows the approach taken by BarNir (2014). In the article, the author uses two measures for innovation, outcome innovation and competitive innovation. The former refers to the actual or intended innovation outputs, while the latter refers to the perception and importance of innovation for the firm’s strategy. Considering that one of the questions in the outcome innovation measure is the question this study uses to filter the dataset³, as well as the fact that two other aspects used to construct the second measure were similar to those used in the first measure⁴, this study combines the two operationalizations for a unified measure of (actual or intended) new venture innovation. The measure was calculated as a proportion of six dichotomous or dichotomized indicators, based on the questions shown in Table 1 below.

³Whether the business is considered to be a hi-tech one.

⁴Whether applying for a patent or a trademark is important for the venture, and whether tech expertise of the team is important for the venture.

Table 2. Construction of New Venture Innovation Variable

| Question Number | Definition |
|-----------------|--|
| AQ F4 | Being first to market a new product or service is important for this new business to be an effective competitor. |
| AQ F9 | Developing new or advanced product technology or process technology for creating goods and services is important for this new business to be an effective competitor. |
| AQ D11 | Has this new business developed any proprietary technology, processes, or procedures that no other company can use, will it develop proprietary technology, processes, or procedures in the future, or is this not relevant to the new business? |
| AQ D13 | Has an application for a patent, copyright, or trademark relevant to this new business been submitted, will an application be submitted in the future, or is this not relevant for the new business? |
| AQ S2 | Right now, are there many, few, or no other businesses offering the same products or services to your potential customers? |
| AQ S5 | Will spending on research and development be a major priority for this new business? |

3.2.2 Independent variables

Industry Experience – was measured as a number of years of work experience the founder had in the industry where this new business will compete, following similar studies such as Delmar & Shane (2006).

Entrepreneurial Experience – was measured as the total number of firms previously owned or co-owned by the members of the founding team, following Delmar & Shane (2006) and Y. Zhang, Yang, Tang, Au, & Xue (2013).

Risk-taking propensity – was measured on a Likert scale from 1 to 5, as an answer to the question “I enjoy the uncertainty of going into a new situation without knowing what might happen”.

Entrepreneurial Commitment – the measure was based on Dimov (2010) as an average score of the entrepreneurs’ level of agreement to the following two questions: “There is no limit as to how long I would give maximum effort to establish my business” and “My personal philosophy is to do whatever it takes to establish my own business.”

Intrinsic Motivation – the measure was based on Wang et al. (2018) as the importance of 12 different questions related to why the entrepreneur wants to start this particular business. Six questions were reflecting intrinsic, and six extrinsic motivation, with the Likert scale-based responses ranging from 1 to 5. The scores for intrinsic and extrinsic motivation were summed and then normalized to the scale from 0 to 1, 1 being intrinsic motivation. The questions are shown in Table 2 below.

Table 3. Construction of the Motivation Variable

| Extrinsic Motivation | Intrinsic Motivation |
|--|--|
| AW1: To achieve a higher position in society | AW2: To have greater flexibility for your personal and family life |
| AW6: To give yourself, your spouse, and your children financial security | AW5: To have considerable freedom to adapt your own approach to work |
| AW4: To be respected by your friends | AW11: To develop an idea for a product |
| AW8: To build a business your children can inherit | AW13: To fulfill a personal vision |
| AW12: To have a chance to build great wealth or a very high income | AW14: To have the power to greatly influence an organization |
| AW9: To earn a larger personal income | AW10: To achieve something and get recognition for it |

Problem-solving ability – was measured on a Likert scale from 1 to 5 as an answer to the question “When thinking about a problem, I consider as many different opinions on the issues as possible.”

3.2.3 Control variables

Gender – Dummy variables, 1 indicating male, 2 female.

Education – the level of education can be an important contributor to the level of human capital of the entrepreneurs leading to a successful venture (Reynolds, 1997). Therefore it is included as a control variable in this study. The measure is comprised of 7 dummy variables, 1 indicating eight grade or less, 2 – incomplete high school, 3 – high school diploma, 4 – incomplete college, 5 – associates degree, 6 – bachelor degree, 7 – postgraduate degree.

Number of owners – the number of founders can have an impact on the direction and the way business is conducted (Hopp & Sonderegger, 2015; Yang, Liu, Zhang, Chen, & Niu, 2015) so it is included as a control variable.

Region – In the U.S., regions differ significantly in the conditions enabling innovation, therefore this study includes it as a control variable. It includes 4 dummy variables, 1 indicating U.S. west, 2 – midwest, 3 – northeast, 4 – south.

Metropolitan status – Similar to the region, metropolitan status can have an impact as it can enable a more conducive innovative environment or make access to innovative and business activities more difficult. It includes 5 dummy variables, 1 indicating central part of a metropolitan area, 2 – outside city center, but inside county center, 3 – inside the suburban county area, 4 – in metropolitan area with no center city, 5 – in non-metropolitan area.

Time to success – considering that the ventures in our sample are in the initial stages of business organization, we included the variable indicating years it took them to become successful based on their innovative activities, in order to control for any big differences between the firms in the sample.

3.3 Methodology

Considering that the independent variable, *New venture innovation*, is a continuous variable, analysis was done using the Ordinary Least Squares regression methodology.

Chapter 4. Results

4.1 Descriptive Statistics

Table 3 shows the descriptive statistics and the correlation values for each of the variables. As seen in the table, all the correlation values are quite low, the highest being 0.29, which is well below the 0.70 threshold, confirming that there are no problems stemming from the correlation between the variables (Cohen, Cohen, West, & Aiken, 2002). In addition to that, the variance inflation factor (VIF) test was performed so as to ensure there are no multicollinearity problems when testing the model. Results are shown in **Table 4**, and it can be seen that all values are close to 1, confirming that there are no issues with multicollinearity (Myers, 2000).

Table 4. Descriptive Statistics

| | Mean | S.D. | Min | Max | Innovation | Industry Experience | Entrepreneurial Experience | Risk Taking | Commitment | Motivation | Problem Solving | Gender | Education | Number of Owners | Region | Metropolitan Status | Time to success |
|----------------------------|-------|-------|-----|-----|------------|---------------------|----------------------------|-------------|------------|------------|-----------------|--------|-----------|------------------|--------|---------------------|-----------------|
| Innovation | 0.464 | 0.222 | 0 | 1 | 1.000 | | | | | | | | | | | | |
| Industry Experience | 10.15 | 10.89 | 0 | 50 | 0.156 | 1.000 | | | | | | | | | | | |
| Entrepreneurial Experience | 1.120 | 1.921 | 0 | 15 | 0.003 | 0.101 | 1.000 | | | | | | | | | | |
| Risk Taking | 3.250 | 1.191 | 0 | 5 | 0.081 | 0.023 | 0.131 | 1.000 | | | | | | | | | |
| Commitment | 1.843 | 0.848 | 1 | 6 | -0.058 | 0.072 | 0.106 | 0.021 | 1.000 | | | | | | | | |
| Motivation | 0.499 | 0.238 | 0 | 1 | 0.193 | 0.127 | 0.078 | 0.160 | 0.117 | 1.000 | | | | | | | |
| Problem Solving | 4.197 | 0.768 | 1 | 5 | -0.065 | 0.028 | 0.053 | 0.039 | 0.010 | 0.061 | 1.000 | | | | | | |
| Gender | 1.296 | 0.457 | 1 | 2 | -0.011 | -0.184 | -0.077 | -0.123 | -0.103 | 0.061 | -0.016 | 1.000 | | | | | |
| Education | 5.261 | 8.060 | 1 | 7 | -0.010 | -0.029 | 0.011 | -0.008 | -0.014 | -0.028 | 0.037 | 0.043 | 1.000 | | | | |
| Number of Owners | 1.873 | 1.572 | 1 | 15 | 0.169 | -0.041 | 0.298 | 0.100 | 0.112 | 0.133 | -0.008 | 0.013 | 0.014 | 1.000 | | | |
| Region | 2.577 | 1.237 | 1 | 4 | 0.020 | -0.014 | -0.046 | -0.019 | -0.168 | -0.124 | 0.099 | -0.016 | 0.048 | -0.035 | 1.000 | | |
| Metropolitan Status | 2.634 | 1.552 | 1 | 5 | 0.085 | 0.019 | -0.007 | -0.065 | -0.003 | -0.093 | 0.034 | -0.021 | 0.026 | -0.076 | 0.059 | 1.000 | |
| Time to success | 0.599 | 1.131 | 0 | 5 | -0.057 | 0.094 | 0.141 | 0.025 | 0.001 | -0.034 | -0.039 | -0.009 | -0.009 | 0.051 | 0.012 | -0.164 | 1.000 |

4.2 OLS Results

Table 5 shows the results from the Ordinary Least Squares estimation. Model 1 includes just the control variables, Models 2 to 7 each of the independent variables, and Model 8 is a full model including all independent and control variables.

Model 1 indicates that the control variable *Number of owners* has a statistically significant and positive effect on the new venture innovation. As shown in Model 2, independent variable *Industry Experience* has a significant and positive effect ($p < 0.05$) on the dependent variable. This effect is also confirmed in the full model (Model 8), thus confirming the Hypothesis 1. Model 3 examines the effect of *Entrepreneurial Experience* on *New Venture Innovation*, however the result is not statistically significant, neither in model 3 nor in the full model. Therefore, Hypothesis 2 is not supported. The effect of *Risk-taking* propensity is examined in Model 4, and it is not statistically significant in both models 4 and 8, rejecting the Hypothesis 3. Model 5 examines the effect of *Entrepreneurial Commitment* on *New venture innovation* and it is not statistically significant. When included in the full model, it becomes slightly significant, however the effect is negative, rather than positive as predicted, thus rejecting the Hypothesis 4. The effect of *Intrinsic Motivation* is examined in Model 6, and it shows

statistically significant ($p < 0.05$) and positive effect, confirming Hypotheses 5. This effect is further confirmed in the Model 8 as well. Finally, Model 7 shows the effect of *Problem-solving* ability on the dependent variable, and the result is statistically insignificant, thus rejecting the Hypothesis 6.

In summary, Hypotheses 1 and 5 are strongly supported, whereas Hypotheses 2, 3, 4 and 6 are not supported by the results.

Table 5. VIF Test Results

| Variable | VIF | 1/VIF |
|---------------------|------------|--------------|
| Startup Experience | 1.16 | 0.864278 |
| Number of owners | 1.14 | 0.879280 |
| Motivation | 1.11 | 0.899845 |
| Industry Experience | 1.08 | 0.922753 |
| Gender | 1.08 | 0.925928 |
| Commitment | 1.07 | 0.935066 |
| Risk Taking | 1.07 | 0.938170 |
| Time to success | 1.07 | 0.938608 |
| Region | 1.06 | 0.943745 |
| Metropolitan status | 1.05 | 0.950786 |
| Problem Solving | 1.02 | 0.975993 |
| Education | 1.01 | 0.992512 |
| Mean VIF | 1.08 | |

Table 6. OLS Results

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|-------------------------|----------------------------|----------------------------|---------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Gender | -0.00547142 (.0286555) | .00970493 (.0287605) | -.00730682 (.02878) | -.00114172 (.0288666) | -.00961426 (.0287891) | -.0106129 (.0282502) | -.00600981 (.0286348) | -.00123923 (.0288313) |
| Education | -.00042849 (.0016273) | -.00033561 (.0016063) | -.00041191 (.0016287) | -.00042475 (.0016262) | -.00043542 (.0016252) | -.00029965 (.0016022) | -.0003654 (.0016268) | -.00013089 (.0015796) |
| Number of owners | .02537561*** (.0083577) | .02638823*** (.0082555) | .02733812*** (.008757) | .02441171*** (.0083911) | .02660232*** (.0083981) | .02207506*** (.008292) | .02535588*** (.0083506) | .0267072*** (.0086042) |
| Region | .00395306 (.0106122) | .00459099 (.0104755) | .00360425 (.0106304) | .00413615 (.0106056) | .00157611 (.0107501) | .0077077 (.0105123) | .00519555 (.0106528) | .00622746 (.0105518) |
| Metropolitan status | .01268433 (.0085837) | .01193479 (.0084752) | .01293999 (.008597) | .01327101 (.0085917) | .01282174 (.0085729) | .01493527* (.0084783) | .01290153 (.0085783) | .01529546* (.0083799) |
| Time to success | .01268433 (.0117361) | -.01366306 (.0116405) | -.00906495 (.011857) | -.01042701 (.0117281) | -.01032514 (.0117205) | -.00837896 (.0115668) | -.01080331 (.0117338) | -.01070093 (.011572) |
| Industry Experience | | .00351534*** (.0012126) | | | | | | .00325348*** (.0012115) |
| Startup Experience | | | -.00547917 (.007241) | | | | | -.00748674 (.0071037) |
| Risk Taking | | | | .01320861 (.011144) | | | | .00986356 (.0109976) |
| Commitment | | | | | -.0208782 (.0158257) | | | -.02583754* (.0154768) |
| Motivation | | | | | | .17455815*** (.0553227) | | .16193875*** (.0561679) |
| Problem Solving | | | | | | | -.0207484 (.0171306) | -.02475222 (.0167156) |
| constant | .38857617*** | .333174*** | .392816*** | .33988626*** | .43595105*** | .29689938*** | .472594*** | .38054485*** |
| R ² | 0.0415 | 0.0698 | 0.0435 | 0.0464 | 0.0475 | 0.0749 | 0.0466 | 0.1185 |
| R ² adjusted | 0.0207 | 0.0462 | 0.0192 | 0.0222 | 0.0234 | 0.0514 | 0.0224 | 0.0795 |

Chapter 5. Discussion and Conclusion

This study examines what are the personal characteristics of entrepreneurs that can provide basis for dynamic capabilities enabling new venture innovation in technology-based ventures. Specifically, the study focuses on those characteristics that are enabling entrepreneurs to sense, seize and reconfigure assets necessary for innovation. Characteristics that are examined are entrepreneurs' previous experience (industry and entrepreneurial), entrepreneurial commitment, risk taking propensity, motivation and problem-solving ability, that were identified as some of those providing microfoundations for dynamic capabilities in entrepreneurship. The study examined the hypotheses based on the individual data on founders of 284 technology-based ventures, gathered from the Panel Study of Entrepreneurial Dynamics II. Overall, the results confirm that entrepreneurs' prior industry experience and the level of intrinsic motivation are positively related to the new venture innovation, while entrepreneurial commitment has a slightly significant negative effect, as opposed to the hypothesized positive effect. This negative effect, although only slightly significant, is interesting, because it suggests that the more effort the entrepreneurs invest in the new venture, the less effective would their innovation efforts be. One of the possible explanations could

perhaps be that being overly persistent and committed to the success of the startup can prevent entrepreneurs from being flexible and realistic when sensing, seizing and reconfiguring entrepreneurial opportunities.

The results of this study confirm, to some extent, that individual characteristics of the entrepreneur could be a meaningful source of dynamic capabilities necessary for innovation in new ventures. Particularly, prior industry experience of the founders is confirmed to be an important source of information and resources necessary enabling dynamic capabilities leading to new venture innovation. The results of this research confirm that entrepreneurs experienced in the industry the new business will operate in will be better equipped to navigate the environment, identify niche markets and utilize the network better as to identify, utilize and reorganize new opportunities leading to new venture innovation. This result is interesting, as it shows the opposite from the results from Delmar & Shane (2006), where entrepreneurial experience has been found to strongly improve the chances of the venture survival, whereas industry experience had no impact.

Furthermore, this research confirms that intrinsic motivation is an important driver in the case of technology-based entrepreneurs. This is significant because it provides evidence that those entrepreneurs motivated by internal goals and sense of achievement and contribution would be better equipped at utilizing and reconfiguring assets and knowledge necessary for innovation, as opposed to

entrepreneurs motivated by external rewards, such as monetary rewards or an improved status in the society. This provides some contribution to the literature gap identified in Carsrud & Brännback (2010) on what motivates different types of entrepreneurs, and what role do intrinsic and extrinsic motivation play with different aspects of entrepreneurial processes.

This study study makes several important contributions to the study of dynamic capabilities. First, it enriches the dynamic capabilities framework by looking deeper into what personal characteristics could provide microfoundations for dynamic capabilities, in this case in the context of technology-based entrepreneurs. In this sense, this research builds on the study by Helfat & Peteraf (2015) and expands the framework as to include other personal characteristics that could possibly underpin dynamic capabilities, in addition to managers' cognitive capabilities. While their study is purely theoretical, this study not only applies the framework to the case of entrepreneurship, but also examines it empirically. In addition, their analysis suggests that it would be beneficial to examine how different cognitive capabilities and characteristics affect the dynamic capabilities in different types of firms, which this study does by applying the framework to a specific context.

Second, there are not many studies that examine dynamic capabilities in the context of entrepreneurship (Zahra et al., 2006) and even less those that examine it empirically. While having some limitations, this study represents an attempt to

develop an empirical approach to testing microfoundations of dynamic capabilities, that can be beneficial in our understanding of the framework and the way it impacts different aspects of performance and innovation in entrepreneurial ventures.

Third, this study uncovers individual characteristics necessary for enhancing dynamic capabilities in entrepreneurs, particularly sensing and reconfiguring, and clarifies the effect previous industry experience and intrinsic motivation have on new venture innovation. Prior research examining these characteristics gives mixed results (e.g., Cassar, 2014; De Spiegelaere et al., 2013; Delmar & Shane, 2006), and this study contributes to the further discussion on the role of both of these. The results confirm that prior industry experience is transferable in the case of technology-based nascent entrepreneurs which can have important managerial and investor implications. Furthermore, the importance of intrinsic motivation in this study confirms that successful entrepreneurs are not always motivated by external rewards, and indicates that tech entrepreneurs that are internally motivated tend to be more innovative.

Finally, this research contributes further to the general field of antecedences of entrepreneurial innovation.

Furthermore, this research also has some managerial and policy implications. First, managers, or founders in the case of entrepreneurship, should utilize their prior experience and network for sensing, seizing and reconfiguring

new opportunities. Those without significant industry experience should invest in creating relationships and gathering information that can help them better navigate the environment. Second, they should strive to take advantage of their higher levels of motivation and invest more efforts into reconfiguration and transformation of their assets and knowledge in order to improve innovation activities. Third, for investors, this research provides insights into what type of skills and motivations should they look for in a founder when considering investing in startups or providing support. Namely, they should invest in startups where the founders have experience in the industry the business will operate in, and that are motivated by internal goals rather than external rewards.

While this study has various theoretical and practical contributions, it still faces certain limitations. Even though PSED II represents a quite rich dataset, at the same time it has limitations in terms of how variables can be operationalized. Although many of the characteristics examined here weren't empirically supported, it doesn't necessarily mean that they are not meaningful predictors of dynamic capabilities in entrepreneurs. Rather, due to limitations in variable construction, they should be re-examined with a more specific dataset. Particularly, considering that the dependent variable is limited in range from 0 to 1, doing the regression after logit transformation of the dependent variable is considered a more appropriate approach than regular OLS regression (Baum, 2008; Warton & Hui, 2011). However, upon doing such additional analysis, the

results indicated that the model fit wasn't the most appropriate, as the R^2 was only 6%. Due to that, results could be interpreted as inconclusive, and other types of data analysis should be done in order to confirm the validity of the results. In addition, similar research should be repeated in a different context in order to account for possible differences in personal and cognitive characteristics of entrepreneurs operating in different industries. Further, the dataset in question deals with entrepreneurs that are at the very beginning of their business organization activities. There could be significant differences between nascent entrepreneurs and those with established startups. This differences should be examined in further research.

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Abstract (Korean)

동적 역량은 오랜 기간 동안 경쟁 우위를 획득하고 혁신을 이루어내기 위해 기업이 자산을 인지(sense)하고, 포착(seize)하며, 재배열(reconfigure)할 수 있도록 해주는 필수적인 기업 특성으로 여겨져 왔다. 하지만, 기업가 정신과 관련한 연구 흐름에서는 동적 역량이 충분히 다루어지지 않았다. 본 연구는 기술 기반 창업가의 개별적 특성을 살펴봄으로써, 기업가 정신 측면에서의 동적 역량에 관한 기존 연구의 한계를 극복하고, 벤처 기업의 혁신을 위해 필요한 동적 역량에 대한 미시적 접근을 시도한다. 본 연구는 창업가의 이전 벤처 경험, 몰입의 정도, 위험 감수 성향, 동기 부여의 유형, 그리고 문제 해결 기량을 창업가가 기업가적 기회를 인지, 포착, 및 재배열 하는 능력을 갖게 해주는 중요한 특성들로 고려한다. 더불어, 해당 특성들이 미국의 기술 기반 초기 기업가들의 새로운 벤처 혁신에 미치는 영향을 실증적으로 규명한다. 본 연구의 결과는 창업가의 기존 산업 경험이 새로운 기회를 포착하는 데 중요한 역할을 하며, 내적 동기는 성공적인 재배열을 위해 꼭 필요함을 제시한다.

주요어 : 동적 역량, 기업가 정신, 이전 벤처 경험, 동기 부여, 혁신, PSED

학 번 : 2016-26925