

# An explorative study of inputs for entrepreneurs' decision-making to create new venture in a high-tech context

The International Journal of  
Entrepreneurship and Innovation  
2017, Vol. 18(4) 243–255  
© The Author(s) 2017  
Reprints and permission:  
sagepub.co.uk/journalsPermissions.nav  
DOI: 10.1177/1465750317723218  
journals.sagepub.com/home/iei



**Mehdi Zivdar**

University of Tehran, Iran

**Narges Imanipour**

University of Tehran, Iran

**Kambeiz Talebi**

University of Tehran, Iran

**Seyed Rasul Hosseini**

Farhangian University, Iran

## Abstract

The explanation of the entrepreneurial decision-making phenomenon requires the adoption of a process approach. Yet, the majority of the research in this field has been done without utilization of a process approach. Besides, the decision-making process of entrepreneurs in any society is influenced by its environmental context. Therefore, this research adopts a process approach and aims to conceptualize inputs of decision-making process for new venture creation (NVC) in an Iranian high-tech context. The research employs qualitative–explorative design in order to take into account the specific regional context of Iran. This study utilized event-based interviews with 20 nascent entrepreneurs. Results of coding, categorizing and validating the research findings, revealed six main conceptual categories as the main inputs of the decision-making process for NVC in this context. The suggested propositions illustrate that the developed categories afford the two elements of individual decision maker and the decision environment. This article advances entrepreneurship literature by adopting an appropriate analytical focus and also utilizing a design which epistemologically and methodologically is applicable for involving context of exploration to attain more rigor and theoretical relevancy.

## Keywords

decision-making process, entrepreneurship, inputs, new venture creation

## Introduction

Entrepreneurial decision-making is a construct which holds an outstanding position in entrepreneurship studies (Vermeulen and Curseu, 2008). Accordingly, entrepreneurs' decision-making for the creation of new ventures is one of the main subjects of entrepreneurship research (Gustafsson, 2006).

Entrepreneurs' decision-making is a phenomenon that takes place in ambiguity or in an uncertain environment (Brundin and Gustafsson, 2013; Greenbank, 2006;

McMullen and Shepherd, 2006; Shepherd et al., 2007, 2015). Consequently, it is not explainable by assumptions of most existing decision-making models. In fact, its explanation entails the adoption of new assumptions (Buchanan and Vanberg, 1991; Sarasvathy, 2001; Schade, 2010). In

---

### Corresponding author:

Narges Imanipour, Faculty of Entrepreneurship, University of Tehran,  
16th. North Karegar St., Tehran, Iran.  
Email: nimanip@ut.ac.ir

addition, explanation of the entrepreneurial action – including the entrepreneurial decision-making – requires the adoption of a process approach (Baron and Shane, 2005; Moroz and Hindle, 2012; Shane et al., 2003; Venkataraman et al., 2012). Yet, the majority of the research in this field has been done without utilization of a process perspective. Likewise, focus of analysis in most existing models does not include constructs or factors such as the environment of the problem in decision-making framework (uncertain environment) (Knight, 1921; Shepherd et al., 2007); institutional and sociocultural environment (Fuduric, 2008; North, 1990); ignorance and doubt (Shepherd et al., 2007); the relationship between uncertainty criteria, decision-making models and venture creation success (Chandler et al., 2011); and cognitive structures and entrepreneur's background (Busenitz and Lau, 1996; Hayek, 2012; Sarasvathy, 2001). These gaps arising out of failure in adopting a process perspective have caused imperfect explanation of entrepreneurs' decision-making process in creation of new business ventures. Whereas utilization of process perspective, based on the process dynamics in the taxonomy of entrepreneurial process models (Moroz and Hindle, 2012), enables exploration of numerous and considerable variables such as contexts and also, uncertainty, entrepreneur's background, primary activities and cognitive structures, which impact entrepreneurs' decisions to create new business ventures.

Besides, the decision-making process of entrepreneurs in any society is influenced by its environmental context (Fuduric, 2008; North, 1990). Concerning the specific regional context of Iran, there is an inadequacy of research in exploring the process, and conceptualizing for constituent elements of the entrepreneurial decision-making for creating new business ventures, particularly in the regional context and environmental conditions of Iran, and in the tremendously uncertain context of the high-tech industries in this country. Thus, the research question is that what the inputs of new venture creation (NVC) decision-making process are in the specific context of Iranian high-tech industries. Accordingly, this research adopts a process approach and a qualitative design to conceptualize inputs of NVC decision-making process in a sample of entrepreneurs of Iranian high-tech industries. These inputs are a set of independent factors in the formation of the process under study. The mentioned factors have substantial impacts on the development of entrepreneur's competencies, and also the manner of problem identification, and the evaluation stages of decision-making process for creating new business ventures. In this regard, Welter and Gartner (2016), Zahra (2007) and Zahra et al. (2014) point to the importance of contextualization in future studies of entrepreneurship as an emerging and novel discipline. Therefore, building concepts and propositions through explorative research plans by paying more attention to the context of investigation, including the nature, uniqueness, dynamics,

distinctive features and limitations, could be a contribution as a strategy to enrich creative and constructive theory buildings in the field of entrepreneurship. This can also facilitate achieving greater rigor and relevance – basically in the qualitative and explorative research plans.

### **Business environment and high-tech businesses in Iran**

According to the 2016 index of economic freedom (Miller and Kim, 2016), Iran with an overall score of 43.5 has a low rank of 171 among 178 countries. This score is below world and regional average likewise. This illustrates the restricted economy of Iran, chiefly from a business environment viewpoint. So that Iran's economy has major concerns related to rule of law, open markets and regulatory efficiency. Its legal framework has deficiencies in such a way that the rule of law is almost fragile. Efforts to enhance the business climate have been modest and occasionally undone to maintain the status quo. The private sector has also been remained largely marginalized.

Based on the facts in the aforementioned report (Miller and Kim, 2016), this country's economy has not achieved notable success in macro level and business environment indexes in recent years. In this respect, sub-indexes associated with the criteria including rule of law, regulatory efficiency, limited government and open markets show some unfavourable conditions for entrepreneurial activities and venture creation. For instance, the regulatory environment remains restrictive, severely constraining private economic activity and strict government controls bound access to financing for most types of businesses.

By contrast, governmental programs and policies promote entrepreneurship with remarkable initiatives in Iran's 'Fifth Development Plan'. Moreover, the country has recognized the significance of high-tech sectors in the economy like other pioneering countries and is in the progress of developing these sectors, especially businesses in private sectors. Organizations and councils including the Iran Vice Presidency for Science and Technology; Iran Ministry of Industry, Mine and Trade; and Industrial Development and Renovation Organization of Iran have particular tasks to determine general policies for the development of high-tech businesses in the country and pursuing the case with implementation of the policies. These organizations are seeking to pave the ground for activity of the private sector and production of wealth within the society through adopting outlook, providing facilities, creating market and removing the existing barriers for venture creation in high-tech sectors. Determining goals, strategies, macro-scale policies and national initiatives for development of the high-tech sectors in the country; description of general tasks for governmental bodies and determination of missions for each sector; and supervision and making coordination among actors of the market within the framework

**Table 1.** Summary of the discussed studies.

Author(s)	Main discussions/findings
Abelson and Levi (1985), Render et al. (1992) and Simon (1987) Brundin and Gustafsson (2013), Greenbank (2006), McMullen and Shepherd (2006), Shepherd et al. (2007) and Shepherd et al. (2015)	General process or framework of decision-making Uncertain context of the entrepreneurial decision-making phenomenon
Ivanova and Gibcus (2003)	Three elements of environment, decision nature and entrepreneur in existing models about the entrepreneurial decision-making phenomenon
Wright et al. (2000)	Entrepreneurs' characteristics more than any other factor are influenced by their mental processes and beliefs
Busenitz and Lau (1996), Acs and Audretsch (1990), Waldinger et al. (1990) and Brenner (1987)	Cognitive development and entrepreneur's cognitive structures and processes
Dyer (1994), Bygrave (1989) and McClelland (1961)	Personality traits of entrepreneurs
Kirzner (1979, 1997), Valliere (2013), Morris et al. (2012) and Tang et al. (2012)	The significant role of entrepreneurial alertness in venture creation process
Busenitz (1999), De Carolis and Saporito (2006), De Kort and Vermeulen (2010) and Simon et al. (2000)	Cognitive biases of entrepreneurs in their decision-makings for venture creation
De Carolis et al. (2009), Greve and Salaff (2003) and Liao and Welsch (2005)	The significant role of entrepreneurs' social capital in venture creation process

of long-term national development plan are some attempts to develop Iran's economy through activities of high-tech sectors.

Therefore, in general and based on global entrepreneurship monitor (GEM) report (Singer et al., 2015), business environment of Iran has a specific condition which is grappling with different problems. The results of GEM show that in terms of perceived capabilities (whether individuals feel they have the knowledge and skills to start up), and early-stage entrepreneurial activity, Iran exceeds the average of its neighbours in the Asian and Oceania region. In this regard, the relative high ranks of 21 (among 73 countries) in both entrepreneurial intention and total early-stage entrepreneurial activities (TEAs) indexes show the percentages of people who are seeking to set up business in such an environment or have recently set up their businesses are noteworthy (Singer et al., 2015). This may deliver a serious challenge for these groups of people during the process of NVC in the context and business environment of Iran (Zivdar and Imanipour, 2017).

## A review of the literature

Simon (1987) specifies that decision-making framework contains three stages of accessing to information, designing and selecting. At the first stage, investigation of the environment, and identifying and defining the problem, is done. At the designing stage, a framework representing the system is constructed. This stage includes identifying variables having effect on the problem and determining relationships among these variables and also evaluation criteria. The selecting stage is assigned to selecting a solution to the problem. Render et al. (1992) have

correspondingly recognized five steps for the decision-making framework, which are as follows:

- (1) identifying and defining the problem,
- (2) investigation to find possible solutions,
- (3) investigation of the consequences related to employ of each solution,
- (4) selecting one of the decision-making models and
- (5) implementing one of the decision-making models and making the decision.

In general, the decision-making process includes identifying and defining a problem, collecting and analysing data, building or finding alternative solutions and finally, evaluating alternatives and selecting one of them (Abelson and Levi, 1985). In the entrepreneurial context, this process takes place in ambiguity or uncertainty (Brundin and Gustafsson, 2013; Greenbank, 2006; McMullen and Shepherd, 2006; Shepherd et al., 2007, 2015), and entrepreneurs benefit from various decision-making logics and models depending on their progress in the process of creating new business ventures (Cunha, 2007).

Ivanova and Gibcus (2003) believe that the majority of the existing models about the entrepreneurial decision-making consist of the three elements of environment, decision nature and entrepreneur. Hence, the main aim of this section is to focus around these three elements and review some of the original literature of entrepreneurship about the three constituent elements of the entrepreneurial decision-making phenomenon. Table 1 demonstrates a summary of the discussed studies in the present section.

According to Ivanova and Gibcus (2003), the entrepreneur's decision is a result of dynamic interactions between individual, environmental and behavioural factors.

Depending on environmental factors and their individual characteristics, entrepreneurs interpret the outcomes of their actions. Meanwhile, the logic or model which they apply impacts on the decision-making process; therefore, in order to explain this process, these questions should be answered that who is the entrepreneur, how does he/she think and which are his/her cognitive mechanisms.

Firstly, Wright et al. (2000) have elucidated concerning the element of entrepreneur that entrepreneurs' characteristics more than any other factor are influenced by their mental processes and beliefs. These features directly affect their decision-making. On this basis, venture creation decision entails a mental process which develops on the centrality of entrepreneur's cognitive structures and processes (Acs and Audretsch, 1990; Busenitz and Lau, 1996; Waldinger et al., 1990). From one perspective, individual (demographic characteristics, traits, etc.) and institutional sociocultural variables impact on the development of cognitive structures and processes and by contrast, these structures and processes lead to the venture creation decision of the entrepreneur (Brenner, 1987; Busenitz and Lau, 1996).

Besides the trait approach which describes distinguishing personality traits of entrepreneurs (internal locus of control, need for achievement, need for independence, dissatisfaction with prior job, family conditions, childhood conditions, etc.) (e.g. Bygrave, 1989; Dyer, 1994; McClelland, 1961), studies concerning questions such as which people and with which kinds of characteristics identify (discover, enact or create) entrepreneurial opportunities have mostly pointed to the significant role of entrepreneurial alertness (Kirzner, 1979, 1997). Furthermore, entrepreneur's prior knowledge and experiences have significant correlation with the entrepreneurial alertness and the likelihood of identifying entrepreneurial opportunities by the entrepreneur (Morris et al., 2012). In this regard, different antecedents or elements have been expressed in determining the level and quality of entrepreneurial alertness in special people. Among them, the richness of schemata, the association of schemata and the priming of schemata (Valliere, 2013) and scanning and search for new information, association and connection of that information with existing knowledge and evaluation and judgement (Tang et al., 2012) are worth noting. Some studies have also pointed to the development of the antecedents of entrepreneurial alertness (as an important cognitive structure of entrepreneurs) due to the social position and interactions of entrepreneurs (e.g. Acs and Audretsch, 1990; Busenitz and Lau, 1996; Waldinger et al., 1990), explaining that certain variables such as background, experiences and sociocultural and economic condition of entrepreneur have significant correlations with each of the entrepreneurial alertness antecedents.

Alongside, the environment continuously provides barriers, drivers and motivators (opportunities and threats) for entrepreneurs' decisions. Complex environment bringing uncertainty and increasing the possibility of facing negative

outcomes affects the decision-making process. Multiplicity of uncertainties in current multifaceted changing business environment has established an unstable environment for the decisions associated with entrepreneurship. In the environment of entrepreneurial activities, different forces and actors such as customers, competitors and governmental institutions are available. Each of them influences entrepreneur's activities in different forms by providing different opportunities or threats. Consequently, the entrepreneur should make a decision regarding how to act in such an environment and along with other actors. A precise decision-making is subject to having a deep understanding of the environment in which the decision is going to be implemented. Without this understanding, it is unlikely to evaluate possible outcomes and choose wisely among them. An ideal decision environment comprises all the alternatives and perfect relevant information. Nonetheless, both the alternatives and information are limited because of the existing limitations in terms of time and resources for accessing to that information. Since the decision-making process takes place in such an environment, uncertainty is the foremost challenge of the decision-making, and the entrepreneur's cognition and evaluations are mechanisms to reduce this uncertainty (Shepherd et al., 2007). Thus, the decision environment and its uncertainties are leading variables in the entrepreneurial decision-making (Ivanova and Gibcus, 2003). Accordingly, one of the most outstanding entrepreneurs' competencies is the competency of acting in environments laden with uncertainties or ambiguities. This entails flexibility and entrepreneurs' risk-taking behaviour. Attending in uncertain conditions makes entrepreneurs rely more on their mind, knowledge and prior experiences. Indeed uncertainty of the problem environment causes entrepreneurs to exploit heuristics rather than causal logics and quantitative frameworks. In this regard, Busenitz (1999) affirms that the uncertainty for the entrepreneur may be shocking and dissuasive in the beginning, unless he/she has a biased approach to it. The study of Simon et al. (2000) correspondingly demonstrates that entrepreneurs may percept lower risks or underestimate associated risks with creating a business venture because of their different kinds of cognitive biases. Simon et al. (2000) also clarify that this underestimation of risks leads to making the decision of venture creation by the entrepreneur.

According to Simon et al. (2000), De Carolis and Saporito (2006) in their theoretical framework indicate some of the entrepreneurs' cognitive biases including overconfidence, illusion of control and representativeness (i.e. belief in the law of small numbers). De Kort and Vermeulen (2010) likewise remark that entrepreneur's relevant experience, uncertainty of the decision environment and entrepreneurial cognition as determinant factors of utilizing cognitive biases and entrepreneurs' heuristics, followed by an entrepreneurial decision. As a result, cognitive biases and their other related processes – as the core cognitive

processes emphasized in the entrepreneurship literature – have major role in the process of NVC decision-making. Similarly, besides being influenced by individual factors, these cognitive processes are developed via social interactions of the entrepreneur, culture impacts and entrepreneur's social status or in other words, relevant environmental and institutional factors (Busenitz and Lau, 1996). In this respect, a concept which is frequently underlined in the literature is the concept of social networks with their fundamental roles in developing the cognitive biases. Yet, social networks as indispensable resources for entrepreneurs contain imperative roles in both phases of opportunity identification and opportunity evaluation. Social networks which get place in the social capital set of entrepreneurs elicit quantity and quality of entrepreneurs' social solidarity with other individuals or groups and reflect social capabilities of the entrepreneurs (De Carolis et al., 2009; Greve and Salaff, 2003; Liao and Welsch, 2005). In relation to the cognitive biases, the impact of social networks is in such a way that the entrepreneurs' membership and position in these networks causes the development of cognitive biases through multiple mechanisms (De Carolis and Saporito, 2006).

Overall, the majority of the extant research in this particular field has been done without utilization of a process approach (e.g. Busenitz and Lau, 1996; Gartner and Liao, 2012; Hopp and Stephan, 2012; Kessler et al., 2012; Tatikonda et al., 2013; Wood and Williams, 2014), aims hypothesis testing, rather than exploration (e.g. Klein, 2016; Maitland and Sammartino, 2015; Miao and Liu, 2010; Xu and Tracey, 2014), and with analysis scopes which have been mostly focused on decision logics, cognitive biases and heuristics in decision-makings of entrepreneurs (e.g. Barsky, 2010; Bryant, 2007; Busenitz, 1999; Covin et al., 2001; Natanios, 2009),<sup>1</sup> and lacking inclusion of constructs or factors such as the environment of the problem in decision-making framework (uncertain environment), institutional and sociocultural environment, ignorance and doubt, cognitive structures and entrepreneur's background in the analysis scopes.

## Methodology

This research was basic from an orientation view and explorative in purpose. The research was also carried out through semi-structured interviews, and a grounded theory approach which is appropriate in some distinguished conditions, such as the conditions of the current research, that is, when there is not sufficient concepts and propositions for explaining a particular process or phenomenon (Birks and Mills, 2015; Strauss and Corbin, 1990); or existing models do not include important concepts or constructs considered by researcher; or there exist developed models, concepts and propositions, but researcher aims to explore a

process, conceptualize or develop propositions in a different specific context (Creswell, 2013).

From a broader perspective, research assumptions correspond with philosophical elements of the social constructivism paradigm. In this paradigm which is often combined with interpretivism (Mertens, 1998), varied and multiple meanings are acquired and interpreted subjectively. In other words, meanings are not simply imprinted on individuals but are formed through interaction with others and through cultural norms that operate in individuals' lives. So that specific contexts in which people live and work are focused, and research relies on the participants' views of the situation. Constructivist researchers often address the processes of interaction among individuals. Moreover, researchers make an interpretation of what they find and an interpretation which can be shaped by their own experiences and background (Creswell, 2013).

Consequently, in terms of epistemology, knowledge nature about the decision-making process of the participant entrepreneurs in this research was subjective. As the same way, from methodological aspect, accessing subjective knowledge requires taking advantage of the methods of knowledge acquisition from images of reality in the mind. Then, in terms of practice, rather than starting with a theory and applying quantitative measurement tools (as in the positivism and post-positivism), this research has made an effort to generate or inductively develop concepts of the process under study. As a result, the research was conducted using an explorative and qualitative design. However, as Creswell (2013) notes, process of the research is inductive, emerging and continuously should be revised from experiences in collecting and analysing the data in the field. Research questions were also open-ended, broad and general in a way that the participants could construct the meaning of their experiences of their decision-making processes.

Population frame of the research was nascent entrepreneurs (owners and founding managers) of high-tech industry Small and Medium-sized Enterprises (SMEs) located in the city of Tehran. Also, consistent with the definition of TEA by GEM (Singer et al., 2015), at the time of the research field study, less than 42 months had been elapsed from the date that their firms started trading. The criterion for determining sample size was theoretical adequacy or reaching saturation in the research. This means that new sampling and interviews were continued until no new data or information was obtained regarding the development of the categories. However, as a general rule for interviews in explorative and qualitative researches, a number of  $(10 \pm 15)$  samples would be sufficient for interviews (Kvale, 1996). Moreover, for the reason of implementing a qualitative-explorative design, it was necessary for the research sample frame to be theoretically relevant. As a result, a purposive theoretical sampling (including open, relational and discriminant samplings) was implemented as the

sampling method in a manner that required an integrated simultaneous gathering and analysis of the data. So that the selecting range was partly extensive at the open stage of the theoretical sampling, then by progress of the research and during the stages of relational and specially, discriminant sampling, the sampling range became narrowed – concerning the criterion of specificity for attaining the theoretical relevancy of the samples. Thus, sampling was non-probability and was continued until the theoretical adequacy. This was obtained during the interviews with the 18th to the 20th samples.

All of the participants were Persian nascent entrepreneurs with a wide range of age from 32 to 73, among them five were female. Whereas, the most outstanding demographic characteristic of the sample of entrepreneurs was the high level of their education. So that 2 participants with BSc degrees, 7 with MSc degrees and 11 participants holding PhD degrees comprised the theoretical sample of entrepreneurs in the current research. The other feature was a direct connection between entrepreneurs' education and their businesses fields of operation. This point reveals the major role of higher academic education in dispatching these entrepreneurs to enter the high-tech business.

Data gathering was done via multiple qualitative event-based interviews with 20 nascent entrepreneurs of the research theoretical sample. The interviews were conducted by the interview protocol which was developed during the revisions made after the pilot interviews. The core logic of the interviews was also based on Dale's zero-based information logic (Dale, 1991). In the zero-based information logic, the researcher's mind is free<sup>2</sup> of foregone conclusions during a field study. Based on this logic, the researcher should minimize biases and incomplete information interferences in favour of discovering the truth in research process. Insisting on this logic makes the researcher gather and analyse information that would help in increasing the actual knowledge within the framework of the research process. Additionally, for the reliability improvement, some structured processes to write, record and interpret data (such as qualitative data analysis software) as well as the interceder agreement method (i.e. parallel data analysis and comparison of the findings) were employed.

The process of data analysis began simultaneously and integrated with the data collection. The process initially was done via coding and detailed line by line or part by part analysis of verbal cues hidden in memos, field notes or short pieces of data. This stage of coding continued until the initial emerging of categories. During this stage, a kind of conceptual control over the data was obtained. For data categorization, inductive process of the constant comparative method (Glaser and Strauss, 1967) was applied which is a useful method to identify patterns in the data and to organize large amounts of data, so as to abstract categories in qualitative researches (Fram, 2013). Using this method,

incidents to incidents, concepts emerging from further incidents in new data and concepts to concepts were compared.

The constant comparative analyses demonstrated analytical discriminations and were continued until the theoretical saturation was reached. Theoretical saturation is obtained when no more new code related to a specific category is recognized in final stages of data gathering. In other words, the categories are well developed. Therefore, during this process, categories were developed and their subcategories, properties and dimensions became apparent. Various methods of reducing biases and improving theoretical sensitivity were employed in all these steps. Examples of such methods include the use of questions, the near and far comparisons and the use of the partners in research process. The aforementioned methods are solutions to observe the actual meaning of data and crossing from description to achieve a level of theoretical analysis.

Multiple methods were applied for establishment of validity or quality of the research. These methods were considered actively within the research process and continued until achieving post-hoc evaluation standards. Quality of research in the qualitative research designs refers to the rigor of research procedures which depends on rigorous approaches to (grounded) data collection and data analysis (Birks and Mills, 2015). Rigor means, too, that the researcher validates the accuracy of the account using one or more of the procedures for validation, such as member checking, triangulation or using peer or external auditors of the accounts (Creswell, 2013). Accordingly, the research validity was established through application of methods containing methodology conformity, interrelated and simultaneous processes of data collection and data analysis, fit and theoretical relevancy of the sample frame and triangulation (comparison of the findings with the original literature, member checking, cross checking and using external auditors of the accounts). The trustworthiness of the research (which has been suggested by Guba and Lincoln (1989) as a criterion for joint assessment of reliability and validity in qualitative researches) was also met using elements of credibility, transferability, dependability and conformability.

## **Research findings**

Results of the grounded data analysis and validating of findings have determined three main categories as inputs of NVC decision-making process in a specific context of Iranian high-tech industries. Accordingly, the concepts of national macro business environment, high-tech micro business environment, governmental incentives and supports, university and research environment, current situation dissatisfaction and entrepreneur's properties and background constitute the inputs set of NVC decision-making process in the sample of entrepreneurs. Table 2

**Table 2.** Results of data analysis and validating the research findings.

Main category	Subcategory	Participant code
National macro business environment	Strategies of import replacement and export development	1-3-4-5-6-7-8-9-10-11-12-14-16-17-18-19-20
	Technology	1-2-3-...-20
	Institutional environment	1-2-3-...-20
	Political sanctions	2-3-4-5-6-7-8-9-10-11-12-14-16-17-18-19-20
	Stagflation	2-3-4-5-6-7-8-9-10-11-12-14-16-17-18-19-20
	Exchange rate	3-4-5-6-7-8-9-10-11-12-14-16-17-18-19-20
High-tech micro business environment	Elements	1-2-3-...-20
	Uncertainty	1-2-3-...-20
Governmental incentives and supports	Services	1-2-3-...-20
	Motivators	1-2-3-...-20
University and research environment	Services	1-2-3-4-5-6-7-8-9-11-12-13-14-15-18-19-20
	Motivators	1-2-3-...-20
Current situation dissatisfaction	Dissatisfaction with personal situation	1-2-3-...-20
	Dissatisfaction with social and business situation	1-2-3-4-5-6-7-9-10-12-13-14-15-16-17
	Relevant knowledge and experiences	1-2-3-...-20
Entrepreneur's properties and background	Social capital and advantageous network position	1-2-3-...-20
	Individual traits	1-2-3-...-20

demonstrates a summary of the concepts and their associated elements.

Codes in the right column of Table 2 refer to the codes of the research participants or, in other words, entrepreneurs of the theoretical sample. On this basis, verbal cues derived from the gathered data through interviews with the referred entrepreneurs have significant effects on the coding process and formation of the corresponding main categories and subcategories. In the middle column of the table, the subcategories associated with each of the main categories are considerable and, finally, the left column of Table 1 belongs to the main categories.

In order to remark the evidences, and the grounded nature of the developed concepts in the data originated from the field, some vignettes or verbal cues related to each of the main categories are illustrated in Table 3.

## Discussion

In this section, a narrative exploring the inputs of studied decision-making process is presented, incorporating the developed categories with their corresponding subcategories (and subsidiaries). Moreover, external support based on the existing literature is provided in appropriate cases.

### *Entrepreneur's properties and background*

The entrepreneur's properties and background is a category that based on the statements of interviewed entrepreneurs, and after the research analysis, could attain a position of

one of the main inputs of the decision-making process for NVC. It is worth noting that according to the research findings, relevant knowledge and experiences of the interviewed entrepreneurs were identified in the three distinguished areas of

- (1) education and research activities background related to high-tech sectors,
- (2) prior experiences in respective industry and
- (3) prior business experiences.

In this regard, Morris et al. (2012) have pointed to the significant correlation between entrepreneurs' experience and knowledge and the entrepreneurial alertness. Dimov (2010) has also signified this group of relevant knowledge and experiences of nascent entrepreneurs as a kind of specific human capital which has a key role in making the decision of nascent entrepreneurs in order to creating new business ventures.

The subcategories corresponding to the main category of entrepreneur's traits and background, consistent with 'given means' in the effectuation theory (Sarasvathy, 2001, 2008), provide a set of effectuate resources for the sample of entrepreneurs. These resources including personal properties of the entrepreneur (e.g. who the entrepreneur is, what he/she knows and whom he/she knows) comprise the entrepreneur's primary set of means in his/her following problem-solving process.<sup>3</sup> Aforementioned resources highlight the key role of the entrepreneur as a unique decision maker in the process of creating 'new means-ends'.

**Table 3.** Examples of verbal cues corresponding to the main categories.

Main category	Verbal cue example	Participant code
National macro business environment	When I was thinking about the creation of this venture, production projects were few, in compare with the past few years. Production rate was decreasing, and economic depression was significant. Accordingly, the sales of our field's products had been decreased	2
High-tech micro business environment	Because of the sanctions, and also the growth of the country's scientific activities, growth of the number of universities and post-graduate students, a reasonable demand for the knowledge-based products was available in the domestic market	4
Governmental incentives and supports	We finally decided to create this firm by the supports and encouragements of the Nanotechnology Initiative Council	1
University and research environment	At that period, we had different experiences of undertaking research projects in the university, and besides, the importance of the nanoscience was becoming more outstanding in the country. Therefore, with believing in my experiences and competencies, and also the competencies of the university students, I gave my proposal of manufacturing the tools required for this technology to the nano educational department. After a while, I came to this conclusion that it would be better to follow this target by starting a private business firm	15
Current situation dissatisfaction	This comes back to the period of my attendance in . . . I should have been employed there as an academic staff, as I had gained so much scientific achievements in the field of biotechnology. Nonetheless because of some sabotages, I couldn't get employed there as an academic staff, and they told me that I had to work at a lower position	18
Entrepreneur's properties and background	When I was studying at the university, I became interested in this field. My education was very effective on my career choice and the decision to create this firm	2

Moreover, results of the analysis on the gathered data show that all of these subcategories have substantial effect on the development of entrepreneurial motivation, entrepreneurial orientation, entrepreneurial alertness and entrepreneurial self-regulation of the sample of entrepreneurs. This matter is also interpretable by referring to the propositions extant in the numerous existing valid studies which some of them are cited in this part. For instance, personal characteristics and childhood period conditions have great impacts on the formation of the entrepreneurial orientation in many entrepreneurs (Dyer, 1994), or prior knowledge and relevant experiences of entrepreneurs have determinant effects on the development of the schemas or entrepreneurial mindsets, and the entrepreneurial alertness (Kirzner, 1997; Valliere, 2013). This also complies with the findings of Santos et al. (2010) which imply that entrepreneurship experience is effective in the development of entrepreneurs' cognitive maps. Similarly, entrepreneurial self-regulation as a combination of entrepreneurs' self-efficacy and regulatory focus (Tumasjan and Braun, 2012) is to a large extent influenced by factors such as the social capital and childhood conditions and upbringing of the research participants. Tumasjan and Braun (2012) have underscored the self-regulation construct as a conclusive element in a successfully accomplishing process of venture creation. For instance, the entrepreneurial self-efficacy has contained an overriding role in implementing and emerging the heuristics and cognitive biases of the sample of entrepreneurs in the current research. However, the entrepreneurial self-efficacy itself is influenced by the social

capital of the entrepreneurs. This implies a proposition in accordance with the theoretical framework of De Carolis and Saporito (2006). Alongside of the cognitive biases, analysis of extracted verbal cues reveals the realist control belief of the interviewees. This belief – which has been arisen from the regulatory focus of these individuals – makes them have a realistic perception of the risks associated with their venture creation process. This proposition has been acknowledged by Hayek (2012) about the relationship between realistic control beliefs and risk perception. Hayek (2012) correspondingly specifies that the control beliefs are intensely originated from the upbringing conditions of childhood period.

Thus, the above discussion leads to the following propositions:

*Proposition 1a:* Entrepreneur's properties and background are positively related to the development of entrepreneurial orientation and entrepreneurial decision-making competencies.

*Proposition 1b:* Entrepreneur's properties and background are likely to provide the entrepreneurial motivation for the decision-making process for NVC.

### *Current situation dissatisfaction*

Current situation dissatisfaction is the other determinant main category which based on the research findings has a pivotal impact on the formation of the decision-making

process for venture creation in the sample of entrepreneurs. In connection to this category, the analysis results determined a remarkable dissatisfaction with the status quo during the research participants' process of decision-making. This dissatisfaction has been a result of issues or problems such as the impossibility of achieving the desired position (e.g. occupational position), a significant reduction in their income or some crucial events bringing affective and emotional reactions.

### *University and research environment*

The dynamics of the high-technology scientific and research environment, and recent years increasing growth of the high-technologies knowledge in Iran, are among notable effective contextual conditions on the decision-making process of the sample of entrepreneurs for venture creation in nano and biotechnology industries. The majority of the studied entrepreneurs in this research were university academic staves or students of the disciplines related to nano and biotechnology sciences. The participants' statements revealed that implementation of applied research projects based on the development of these technologies with the aim of meeting the needs of governmental and non-governmental institutions has made Iran's high-tech university and research environment an enabling and driving environment for leading them to make the decision of NVC.

### *Governmental incentives and supports*

Governmental incentives and supports are the other main category corresponding to the specific regional context. The Iran's governmental councils with specified tasks delivering services to high-tech nascent entrepreneurs and governmental incentives (rules and executive regulations for supporting high-tech ventures and firms, knowledge commercialization, innovations and inventions, tax exemptions, etc.) as the other part of effective specific contextual conditions on the decision-making process have been an important motivator for the sample of entrepreneurs to make the decision of venture creation in Iran's nano and biotechnology industries.

The above discussions give rise to the next propositions:

*Proposition 2:* Governmental incentives and supports are likely to provide the entrepreneurial motivation for the decision-making process for NVC.

*Proposition 3:* University and research environment is likely to provide the entrepreneurial motivation for the decision-making process for NVC.

*Proposition 4:* Current situation dissatisfaction is likely to provide the entrepreneurial motivation for the decision-making process for NVC.

### *High-tech micro business environment*

High-tech micro business environment contains a wide range of elements such as customers, suppliers, competitors, market structure, labour market and financial institutions related to the activities of the high-tech business. The development and saturation of a number of the secondary subcategories corresponding to some of the aforementioned elements point to the impact of this contextual factor on the interviewed entrepreneurs' decision-making process. It is notable that the number, diversity and the amount of interactions between the forenamed elements and their components have established a complex environment for the high-tech businesses (Maine et al., 2015; Ratner and Ratner, 2003; Schulte, 2005). Indeed the nature of this environment has provided the entrepreneurial opportunities and also an ambiguity or an uncertain environment for the decision-making process of the entrepreneurs to create ventures in the high-tech context.

This leads to the following propositions:

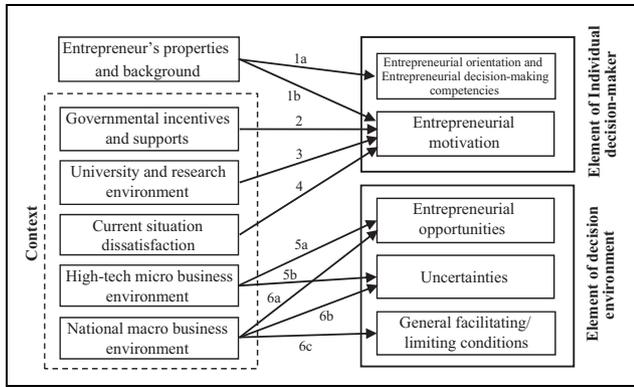
*Proposition 5a:* High-tech micro business environment is likely to provide entrepreneurial opportunities of the decision-making process for NVC.

*Proposition 5b:* High-tech micro business environment is likely to afford uncertainties of the decision-making process for NVC.

The revealed uncertainties in the studied process show both the 'ignorance' and the 'doubt' dimensions which have fundamentally acted in the opportunity identification and the opportunity evaluation stages, respectively. This makes relevant information about the environment nature, environmental effects on business dimensions and outcomes of decision alternatives, a competitive advantage (Shepherd et al., 2007). So that the amount of accessing to relevant knowledge, entrepreneurial alertness and entrepreneurs' cognitive processes for interpreting the relevant knowledge arose from this complex environment has outstanding roles in the decision-making process of entrepreneurs (Renko et al., 2012). This also reveals the importance of entrepreneurial orientation, entrepreneurial alertness and entrepreneurial self-regulation (e.g. cognitive biases and control believes) resulting from factors such as prior knowledge and experiences, advantageous network position and other entrepreneur's personal characteristics in this process.

### *National macro business environment*

As a final point, the results of research analysis demonstrated national macro business environment as the other determinant input of the decision-making process of the sample of entrepreneurs. This main category belongs to a complex of structural conditions emanated from the general contextual conditions which afford entrepreneurial



**Figure 1.** Inputs of NVC decision-making process and the two elements of the entrepreneurial decision-making. NVC: new venture creation.

opportunities and uncertainties and also facilitate or limit the decision-making process of the interviewed entrepreneurs. The national macro business environment is typically an extensive range of concepts including the economic structure, main actors of the economic environment, institutional environment and a set of development strategies and economic policies (Worthington and Britton, 2009). The relations of some of these features with the decision-making process of the sample of entrepreneurs were established by the development of a certain number of subcategories. A full list of these subcategories is presented in Table 2, corresponding to the main category of national macro business environment. The statements of the interviewed entrepreneurs indicate that their cognition and mental representations from the impacts of these factors on their venture creation process point to the both facilitating and limiting dimensions. In a way that the research participants mentioned the institutional environment (sociocultural environment, bureaucracy, regulation in relation to the ease of doing business), stagflation, political sanctions and exchange rate instability (and economic instabilities caused by them) limiting. In this regard, Gibcus et al. (2008) imply that the decision-making of entrepreneurs is permanently affected by economic situations. By contrast, the participating entrepreneurs cited some facilitating aspects of the advances in technology and strategies of import replacement and export development.

The discussion leads to the last propositions:

*Proposition 6a:* National macro business environment is likely to provide entrepreneurial opportunities of the decision-making process for NVC.

*Proposition 6b:* National macro business environment is likely to afford uncertainties of the decision-making process for NVC.

*Proposition 6c:* National macro business environment is likely to provide the general facilitating/restraining conditions of the NVC decision environment.

## Conclusions

The decision-making process of entrepreneurs for NVC is one of the fundamental concepts in the entrepreneurship discipline and researches of the field (Gustafsson, 2006). Due to the importance of contextualization in future studies and theory developments of the entrepreneurship discipline (Welter and Gartner, 2016; Zahra, 2007; Zahra et al., 2014), the specific regional context of Iran needs to be taken into account in exploration of the decision-making process of this country's entrepreneurs. Accordingly, Iran's specific high-tech context and uncertainties arisen from this context impact the decision-making process of entrepreneurs of Iran's high-tech sectors. Therefore, the research main question was that what the inputs of NVC decision-making process are in the specific context of Iranian high-tech industries. The research applied an explorative–qualitative design based on the philosophical elements of the constructivist paradigm in order to investigate the impacts of the Iranian high-tech business context on the decision-making process of a theoretical sample of nascent entrepreneurs and to conceptualize inputs of the NVC decision-making process of these entrepreneurs. Results of coding, categorizing and validating the research findings determined six main conceptual categories of national macro business environment, high-tech micro business environment, governmental incentives and supports, university and research environment, current situation dissatisfaction and entrepreneur's properties and background, as inputs of the decision-making process for NVC in the sample of entrepreneurs of Iranian high-tech industries.

Furthermore based on the grounded evidence, and the external support of the original literature (as previously discussed), followed by the suggested propositions, the developed categories arrange for two elements of the individual decision maker and the decision environment (see Figure 1). These elements correspond with two of the three elements of the entrepreneurial decision-making phenomenon – that is, environment, decision nature and entrepreneur (Ivanova and Gibcus, 2003). This conclusion is also aligned with the two parts of decision maker and environment (as entrepreneurial decision context) in 'map of entrepreneurial decision-making research' proposed by Shepherd et al. (2015).

The contribution of the present research is the advancement of the entrepreneurship literature by adopting an appropriate analytical focus and utilizing a design which epistemologically and methodologically is applicable for involving specific contexts to reach more rigor and theoretical relevancy and develop constructs fitting the context of exploration. Considering the theoretical aspect, this study contributes to the academic field of entrepreneurship by utilizing a process approach to conceptualize inputs of an entrepreneurial decision-making process and analytically

focusing on the entire process in a specific context. The study also contributes to the emerging discipline of entrepreneurship in view of the call made by a number of scholars (e.g. Welter, 2011; Welter and Gartner, 2016; Zahra, 2007; Zahra et al., 2014) to organize researches aiming contextualization and paying more attention to the nature of the context of investigation. Therefore, the research developed concepts – concerning their links to the specific investigation context – can provide useful insights for future studies in exploring the venture creation decision-making process and the entrepreneurial decision-making process in general, in relation to the complex nature of contexts that provides the environment of the process.

The article holds important implications for entrepreneurs, so that during the evaluations of the decision-making process for entering to the field of entrepreneurship, high-tech researchers interested in starting a new venture may contemplate their effectuate resources and entrepreneurial competencies as some valuable competitive advantages for the process of NVC, dealing with or passing through barriers and exploiting opportunities arising from the contextual conditions.

The findings have also important practical implications for educational and public policy initiatives. The research findings may be contributory for entrepreneurship educational programs and course plans, as some grounded evidences of a specific context which has been rarely manifested in educational courses of the field. There would be implications for public initiatives tasked in development of entrepreneurship in high-tech sectors. Practical supports of the associated governmental organizations and councils could provide the entrepreneurs with encouraging entrepreneurial beliefs and motivational drivers during the process of venture creation decision-making.

Moreover, there are some opportunities for empirical research related to the results and findings. Future studies may employ more quantitative designs for exploring the venture creation decision-making process to conceptualize other constituents of this process and develop propositions as for the relationships between developed constructs in other or similar contexts.

The research findings and conclusions are context specific, thus the research has limitations concerning the generalizability of its findings, so that its conclusions and implications may not be generalized or applicable in other contexts. Therefore, empirical researchers may test out the generalizability of the current results to other statistical population frames using quantitative techniques. It may similarly be constructive to design quantitative researches for testing out the impacts of the developed inputs on the formation of particular entrepreneurial decision-making processes in other sample or population frames.

## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

## Notes

1. These researches have mainly affirmed that risk perception as an antecedent of venture creation decision is significantly affected by cognitive biases of the entrepreneurs.
2. A free mind is basically different from an empty mind. Researcher's mind is to be free but not empty. The researcher should be theoretically sensitive.
3. The given resources in combination with contingencies create an effect which is not preselected or predefined, but is constructed as an integral part of the effectuate decision-making process (Sarvasathy, 2001).

## References

- Abelson RP and Levi A (1985) Decision making and decision theory. In: Lindzey G and Aronson E (eds), *The Handbook of Social Psychology*. New York: Random House, pp. 231–309.
- Acs ZJ and Audretsch DB (1990) *The Economics of Small Firms: A European Challenge*, Boston: Kluwer Academic Publishers.
- Baron R and Shane S (2005) *Entrepreneurship: A Process Perspective*. Ohio: Southwestern Thomson.
- Barsky DE (2010) *Entrepreneurial Heuristics and Serial Entrepreneurs*. Pennsylvania: Temple University Press.
- Birks M and Mills J (2015) *Grounded Theory: A Practical Guide*. California: SAGE.
- Brenner R (1987) National policy and entrepreneurship. *Journal of Business Venturing* 2(2): 95–99.
- Brundin E and Gustafsson V (2013) Entrepreneurs' decision making under different levels of uncertainty: the role of emotions. *International Journal of Entrepreneurial Behavior and Research* 19(6): 568–591.
- Bryant P (2007) Self-regulation and decision heuristics in entrepreneurial opportunity evaluation and exploitation. *Management Decision* 45(4): 732–748.
- Buchanan JM and Vanberg VJ (1991) The market as a creative process. *Economics and Philosophy* 7(2): 167–186.
- Busenitz LW (1999) Entrepreneurial risk and strategic decision making: it's a matter of perspective. *The Journal of Applied Behavioral Science* 35(3): 325–340.
- Busenitz LW and Lau CM (1996) A cross-cultural cognitive model of new venture creation. *Entrepreneurship: Theory and Practice* 20(4): 25–40.
- Bygrave W (1989) The entrepreneurship paradigm: a philosophical look at its research methodologies. *Entrepreneurship: Theory and Practice* 14(1): 7–30.

- Chandler GN, DeTienne DR and McKelvie A (2011) Causation and effectuation processes: a validation study. *Journal of Business Venturing* 26(3): 375–390.
- Covin JG, Slevin DP and Heeley MB (2001) Strategic decision making in an intuitive vs. technocratic mode: Structural and environmental considerations. *Journal of Business Research* 52(1): 51–67.
- Creswell JW (2013) *Qualitative Inquiry and Research Method: Choosing Among Five Approaches*. California: SAGE.
- Cunha MP (2007) Entrepreneurship as decision making: rational, intuitive and improvisational approaches. *Journal of Enterprising Culture* 15(1): 1–20.
- Dale AI (1991) *A History of Inverse Probability: From Thomas Bayes to Karl Pearson*. New York: Springer-Verlag.
- De Carolis DM and Saporito P (2006) Social capital, cognition, and entrepreneurial opportunities: a theoretical framework. *Entrepreneurship: Theory and Practice* 30(1): 41–56.
- De Carolis DM, Litzky BE and Eddleston KA (2009) Why networks enhance the progress of new venture creation: The influence of social capital and cognition. *Entrepreneurship: Theory and Practice* 33(2): 527–545.
- De Kort MJ and Vermeulen PA (2010) Entrepreneurial decision-makers and the use of biases and heuristics. In: Vermeulen PA and Curseu PL, (eds), *Entrepreneurial Strategic Decision-Making: A Cognitive Perspective*, Cheltenham, UK: Edward Elgar Publishing Limited, pp. 123–134.
- Dimov D (2010) Nascent entrepreneurs and venture emergence: opportunity confidence, human capital, and early planning. *Journal of Management Studies* 47(6): 1123–1153.
- Dyer WG (1994) Toward a theory of entrepreneurial careers. *Entrepreneurship: Theory and Practice* 27(2): 7–21.
- Fram SM (2013) The constant comparative analysis method outside of grounded theory. *The Qualitative Report* 18(1): 1–25.
- Fuduric N (2008) *Individuals and opportunities: a resource-based and institutional view of entrepreneurship*. PhD Thesis, Aalborg University, Denmark.
- Gartner WB and Liao J (2012) The effects of perceptions of risk, environmental uncertainty, and growth aspirations on new venture creation success. *Small Business Economics* 39(3): 703–712.
- Gibcus P, Vermeulen PA and De Jong JP (2008) Strategic decision making in small firms: a taxonomy of small business owners. *International Journal of Entrepreneurship and Small Business* 7(1): 74–91.
- Glaser BG and Strauss AL (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine De Gruyter.
- Greenbank P (2006) Starting up in business: an examination of the decision-making process. *The International Journal of Entrepreneurship and Innovation* 7(3): 149–159.
- Greve A and Salaff JW (2003) Social networks and entrepreneurship. *Entrepreneurship: Theory and Practice* 28(1): 1–22.
- Guba EG and Lincoln YS (1989) *Fourth Generation Evaluation*. California: SAGE.
- Gustafsson V (2006) *Entrepreneurial Decision-Making: Individuals, Tasks and Cognitions*. Cheltenham, UK: Edward Elgar Publishing.
- Hayek M (2012) Control beliefs and positive psychological capital: Can nascent entrepreneurs discriminate between what can and cannot be controlled? *Journal of Management Research* 12(1): 3–13.
- Hopp C and Stephan U (2012) The influence of socio-cultural environments on the performance of nascent entrepreneurs: community culture, motivation, self-efficacy and start-up success. *Entrepreneurship and Regional Development* 24(9-10): 917–945.
- Ivanova E and Gibcus P (2003) *The Decision-Making Entrepreneur*. Netherlands: SCALES.
- Kessler A, Korunka C, Frank H, et al. (2012) Predicting founding success and new venture survival: a longitudinal nascent entrepreneurship approach. *Journal of Enterprising Culture* 20(1): 25–55.
- Kirzner IM (1979) *Perception, Opportunity, and Profit*. Chicago: University of Chicago Press.
- Kirzner IM (1997) Entrepreneurial discovery and the competitive market process: an Austrian approach. *Journal of Economic Literature* 35(1): 60–85.
- Klein G (2016) Different thinking or similar models: Do entrepreneurs and franchisees apply the same decision-making models prior to establishing a company? *Journal for International Business and Entrepreneurship Development* 9(3): 342–357.
- Knight F (1921) *Risk, Uncertainty and Profit*. New York: Houghton Mifflin.
- Kvale S (1996) *Interviews: An Introduction to Qualitative Research Interviewing*. California: SAGE.
- Liao J and Welsch H (2005) Roles of social capital in venture creation: key dimensions and research implications. *Journal of Small Business Management* 43(4): 345–362.
- McClelland DC (1961) *The Achieving Society*. New Jersey: Van-Nostrand.
- McMullen JS and Shepherd DA (2006) Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review* 31(1): 132–152.
- Maine E, Soh PH and Dos Santos N (2015) The role of entrepreneurial decision-making in opportunity creation and recognition. *Technovation* 39-40: 53–72.
- Maitland E and Sammartino A (2015) Decision making and uncertainty: the role of heuristics and experience in assessing a politically hazardous environment. *Strategic Management Journal* 36(10): 1554–1578.
- Mertens DM (1998) *Research Methods in Education and Psychology: Integrating Diversity with Quantitative and Qualitative Approaches*. California: SAGE.
- Miao Q and Liu L (2010) A psychological model of entrepreneurial decision making. *Social Behavior and Personality: An International Journal* 38(3): 132–145.
- Miller T and Kim AB (2016) *2016 Index of Economic Freedom: Promoting Economic Opportunity and Prosperity*. Washington, D.C: The Heritage Foundation.

- Moroz PW and Hindle K (2012) Entrepreneurship as a process: toward harmonizing multiple perspectives. *Entrepreneurship: Theory and Practice* 36(4): 781–818.
- Morris MH, Kuratko DF and Schindehutte M, et al. (2012) Framing the entrepreneurial experience. *Entrepreneurship: Theory and Practice* 36(1): 11–40.
- Natanios M (2009) *Individual differences between entrepreneurs and managers*. Doctoral Thesis, Wayne State University, Michigan.
- North D (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.
- Ratner MA and Ratner D (2003) *Nanotechnology: A Gentle Introduction to the Next Big Idea*. New Jersey: Prentice Hall Professional.
- Render B, Ralph M and Stair S (1992) *Introduction to Management Science*. Massachusetts: Allyn and Bacon.
- Renko M, Shrader RC and Simon M (2012) Perception of entrepreneurial opportunity: a general framework. *Management Decision* 50(7): 1233–1251.
- Santos SC, Curren L and Caetano A (2010) Cognitive maps in early entrepreneurship stages from motivation to implementation. *The International Journal of Entrepreneurship and Innovation* 11(1): 29–44.
- Sarasvathy SD (2001) Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review* 26(2): 243–263.
- Sarasvathy SD (2008) *Effectuation: Elements of Entrepreneurial Expertise*. Cheltenham, UK: Edward Elgar Publishing.
- Schade C (2010) Entrepreneurial decision making: a paradigm rather than a set of questions: introduction to special section based on Lally–Darden–Humboldt young entrepreneurship scholars’ retreat 2006. *Journal of Business Venturing* 25(2): 173–174.
- Schulte J (2005) *Nanotechnology: Global Strategies, Industry Trends and Applications*. New Jersey: John Wiley and Sons.
- Shane S, Locke EA and Collins CJ (2003) Entrepreneurial motivation. *Human Resource Management Review* 13(2): 257–279.
- Shepherd DA, McMullen JS and Jennings PD (2007) The formation of opportunity beliefs: overcoming ignorance and reducing doubt. *Strategic Entrepreneurship Journal* 1(1-2): 75–95.
- Shepherd DA, Williams TA and Patzelt H (2015) Thinking about entrepreneurial decision making: review and research agenda. *Journal of Management* 41(1): 11–46.
- Simon HA (1987) Making management decisions: the role of intuition and emotion. *The Academy of Management Executive* 1(1): 57–64.
- Simon M, Houghton SM and Aquino K (2000) Cognitive biases, risk perception, and venture formation: how individuals decide to start companies. *Journal of Business Venturing* 15(2): 113–134.
- Singer S, Amorós JE and Arreola DM (2015) *Global Entrepreneurship Monitor: 2014 Global Report*. London, UK: Global Entrepreneurship Research Association, London Business School.
- Strauss AL and Corbin JM (1990) *Basics of Qualitative Research*. California: SAGE.
- Tang J, Kacmar KM and Busenitz LW (2012) Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing* 27(1): 77–94.
- Tatikonda MV, Terjesen SA, Patel PC, et al. (2013) The role of operational capabilities in enhancing new venture survival: A longitudinal study. *Production and Operations Management* 22(6): 1401–1415.
- Tumasjan A and Braun R (2012) In the eye of the beholder: How regulatory focus and self-efficacy interact in influencing opportunity recognition. *Journal of Business Venturing* 27(6): 622–636.
- Valliere D (2013) Towards a schematic theory of entrepreneurial alertness. *Journal of Business Venturing* 28(3): 430–442.
- Venkataraman S, Sarasvathy SD, Dew N, et al. (2012). Whither the promise? Moving forward with entrepreneurship as a science of the artificial. *Academy of Management Review* 37(1): 33–21.
- Vermeulen PA and Curseu PL (2008) *Entrepreneurial Strategic Decision-Making: A Cognitive Perspective*. Cheltenham, UK: Edward Elgar Publishing.
- Waldinger R, Aldrich H and Ward R (1990) Opportunities, group characteristics, and strategies. In: Waldinger R, Aldrich H and Ward R and Associates (eds), *Ethnic Entrepreneurs*. California: SAGE, pp. 13–48.
- Welter F (2011) Contextualizing entrepreneurship—conceptual challenges and ways forward. *Entrepreneurship: Theory and Practice* 35(1): 165–184.
- Welter F and Gartner WB (2016) *A Research Agenda for Entrepreneurship and Context*. Cheltenham, UK: Edward Elgar Publishing.
- Wood MS and Williams DW (2014) Opportunity evaluation as rule-based decision making. *Journal of Management Studies* 51(4): 573–602.
- Worthington I and Britton C (2009) *The Business Environment*. New Jersey: Pearson Education.
- Wright M, Hoskisson RE, Busenitz LW, et al. (2000) Entrepreneurial growth through privatization: The upside of management buyouts. *Academy of Management Review* 25(3): 591–601.
- Xu H and Tracey TJ (2014) The role of ambiguity tolerance in career decision making. *Journal of Vocational Behavior* 85(1): 18–26.
- Zahra SA (2007) Contextualizing theory building in entrepreneurship research. *Journal of Business Venturing* 22(3): 443–452.
- Zahra SA, Wright M and Abdelgawad SG (2014) Contextualization and the advancement of entrepreneurship research. *International Small Business Journal* 32(5): 479–500.
- Zivdar M and Imanipour N (2017) Antecedents of new venture creation decision in Iranian high-tech industries: conceptualizing by a non-teleological approach. *The Qualitative Report* 22(3): 732–744.