

STRATEGIC MANAGEMENT IN NEW VENTURES: THE ROLE OF TECHNOLOGICAL, ORGANIZATIONAL AND ENVIRONMENTAL FACTORS

Ehsan Shahidifar

Islamic Azad University, Iran

E-mail: e.shahidifar@gmail.com

Received October 2015; accepted March 2016

Abstracts

Today, as firms become more competitive in their fields, the use of strategic insights and management practices are becoming an integral part of the firms' activities- especially for new ventures which are in the early phases of their lifecycle. Indeed, they cannot improve their performance if they do not take advantage of such tools and mechanisms. On the other hand, nascent firms are facing lots of problems due to the lack of appropriate use of strategic insights. One of the main problems is the acceptance of strategic management practices in such companies. Then, in this paper, the authors try to investigate the elements which affect their acceptance. Authors use technology-organization-environment (TOE) framework to examine the hypotheses. Findings reveal that all the factors were influential, other than complexity, vendors' support, firm size, and industry type.

Research paper

Keywords: Strategic management, New ventures, Acceptance, Technological factors, Organizational factors, Environmental factors

Reference to this paper should be made as follows: Shahidifar, E. (2016). "Strategic management in new ventures: the role of technological, organizational and environmental factors", Journal of Entrepreneurship, Business and Economics, Vol. 4, No. 2, pp. 130–149.

Introduction

Large, medium, and small firms and new ventures around the world utilize strategic management practices and tools to guide their activities (Salamzadeh, 2015). In fact, strategic management practices are becoming an inevitable issue for the companies to run their daily affairs. On the other hand, the literature provides an extensive list of incentives and obstacles to adoption and use of strategic management tools and techniques by SMEs (Wymer & Regan, 2005; Al-Qirim, 2007). Indeed, despite advances in strategic management and the acceptance by large organizations of such practices, the same level of adoption is not prevalent among SMEs. This also suggests that SMEs face significant and unique challenges in adopting strategic management tools (Farsi et al., 2014). This low level of adoption particularly impedes new ventures in developing countries. Moreover, for instance, cultural barriers in some countries may also exist to deter the acceptance of strategic insights as a way of guiding any business (Kapurubandara & Lawson, 2006).

Among SMEs, new ventures, which are established based on knowledge and new technologies (Tanha et al., 2011), are to a great deal, exposed to different elements which affect their degree of acceptance. Moreover, many scholars have been trying to find factors that influence the firms' acceptance of strategic management practices, thereby ultimately enhancing its usage (Schepers & Wetzels, 2007). Therefore, in this research the authors try to investigate the elements which affect their acceptance. Authors use technology-organization-environment (TOE) framework to examine the hypotheses. The main theoretical/practical contributions of this research are as follows: (i) to investigate the acceptance of strategic management in Iranian

new ventures, (ii) to elaborate the affecting elements and the degree to which they might need to be considered, and (iii) to help researchers, policy-makers and officials in taking required actions for helping these new ventures in eliminating the obstacles. In this paper, the authors provide a brief and exact review of the literature. Then, the theoretical model is proposed. Methodological issues are discussed next; and the authors discuss the findings. Finally, the paper concludes with some main findings and future directions for research.

Literature Review

New ventures vary substantially in their resource positions, the goals of their founders and their potential to grow (Cooper, 1981). He examined strategic management separately in the start-up stage, and highlights its importance. Some scholars report that only about 25 percent of new ventures survive their first five years, and one of the main reasons for their failure is their lack of attention to strategic issues (Ireland et al., 2001). On the other hand, these firms face comparable challenges with regard to accepting and implementing such insights. The extensive acceptance of these tools enacted an opportunity for new organizational forms to emerge in new markets and possibly transform established markets. Yet, these new organizational entities that exploited the capabilities of strategic management techniques had no organizational edifice upon which to pattern their own nascent structure (Salamzadeh and Kawamorita, 2015).

In fact, the main task of strategic management is to maintain an appropriate balance between these fundamentally different processes (Burgelman, 1983). Like entrepreneurship, strategic management is also concerned with

“the exploitation of profitable opportunities”. Many entrepreneurial efforts succeed and lead, in turn, to the formation of new ventures and wealth creation for both the entrepreneurs and investors, while some fail due to lack of strategic insights (Zahra & Dess, 2001). However, if risk, uncertainty, threats, opportunities, etc., as variables or areas of study critical to understanding strategic management, are ignored simply because these are too complex to be understood easily, the field of strategic management may be left floundering in its attempt to understand, predict, and influence firms’ future, if such variables remain undefined (Baird & Thomas, 1985).

With the growing reliance on changing systems and increasing rapidity of the introduction of new technologies, firms’ acceptance of strategic issues continues to be an important issue (Zarea and Salamzadeh, 2012). The literature generally reviews potential readiness, adoption and diffusion factors which SMEs perceived as important to influence their decision. To some extent, the studies propose some models as a basis of considering firm readiness and adoption to embrace strategic management applications. Such studies concern the pre-adoption and adoption stages issue by addressing the potential motivations and barriers of its acceptance (Tanha et al., 2011). Moreover, the integration of knowledge about entrepreneurship and strategic management is important for advancing our understanding of how wealth is created in new ventures and established firms (Ireland et al., 2003).

Strategic management is an entrepreneurial task, and the owner/operator of the small business firm therefore is the master strategist for the organization (Dollinger, 1984). The identification and exploitation of opportunities is the essence of entrepreneurship- whereas the essence of strategic management

is in how these opportunities can be transformed into sustainable competitive advantages (Kraus & Kauranen, 2009). Typically, avoidance of strategic management is justified on the basis of everyday operational and administrative decisions, which by their nature may be complex and demanding and often leave little time for anything else (Beaver, 2002). The field of strategic management is currently facing a number of fresh and somewhat unexpected challenges rooted in the restless dynamics of environment (Dagnino & Padula, 2009).

Yet, there are some controversial issues in the emerging domain of strategic entrepreneurship in new ventures. For instance, strategic management is, by definition, focused on strategic actions, whereas entrepreneurship is concerned with many nonstrategic activities, such as firm organizing, resource assembly, and the establishment of legal entities (Shane, 2012). To some scholars, at the heart of the intersection between entrepreneurship and strategic management is corporate entrepreneurship, that is, entrepreneurship inside a firm (Ren & Guo, 2011). Central to the relational view of strategic management is the notion that firms enter inter-organizational relationships to gain competitive advantage, for instance, by accessing unique resources of a partner, which is an integral part of any success in running a new venture (Keil et al., 2010).

Different authors use different terms to show acceptance. Kwon and Zmud (1987) have proposed a phased model consisting of six stages: (i) initiation (organizations find the *match* between solutions and its application in organization); (ii) adoption (decision is reached to *invest* resources); (iii) adaptation (applications are *available* for use); (iv) acceptance (applications are *employed* in organizational use); (v) routinization (organization's *govern-*

ance systems are adjusted to account for the application); and (vi) infusion (applications are used within the organization to its *fullest potential*) (Dholakia & Kshetri, 2004). This model implies that strategic management is controlled through deliberate planning processes and employee management systems (Paarlberg & Bielefeld, 2009).

In sum, though some researchers suggest that entrepreneurship is about venture creation, strategic management is about how an advantage is maintained from what is already established and created (Zahra, 2008). However, strategic management is an organization-wide activity in which each level has to contribute in its own way (Kraus et al., 2007). Using strategic management might seem to be unattractive for new ventures, because most new ventures are both asset poor and cash poor during their early years (Venkataraman, 1997). To build profitable market positions, new ventures have to address multiple challenges on several fronts. These ventures can compete by being simple (focused) or applying varied ways to compete. The likelihood of these ventures remaining competitive depends on their use of strategic insights (Larrañeta et al., 2012).

Theoretical Framework

As mentioned earlier, the objective of this study is to develop and test an integrated conceptual model of the strategic management acceptance in new ventures. Several scales adapted from the literature on strategic management acceptance, measuring the constructs (Markovic and Salamzadeh, 2012). As Oliveira and Martins (2011) argue, there are many theories to study strategic management acceptance at firm level. The most used theories are as follows: (i) technology acceptance model (TAM) (Davis 1986), (ii) theory of planned

behavior (TPB) (Ajzen, 1985), (iii) unified theory of acceptance (Markovic and Salamzadeh, 2012), (iv) DOI (Rogers, 2004), and (v) the technology-organization-environment (TOE) framework (Tornatzky and Fleischman 1990). In this study, the authors follow the TOE framework. The TOE framework posits that the adoption of strategic management practices depends on organizational, environmental, and technological factors. Then the research hypotheses are categorized under these three factors (see Figure 1). Table 1 shows the operational definition of the variables.

Figure 1. Conceptual framework (Source: Self-elaborated)

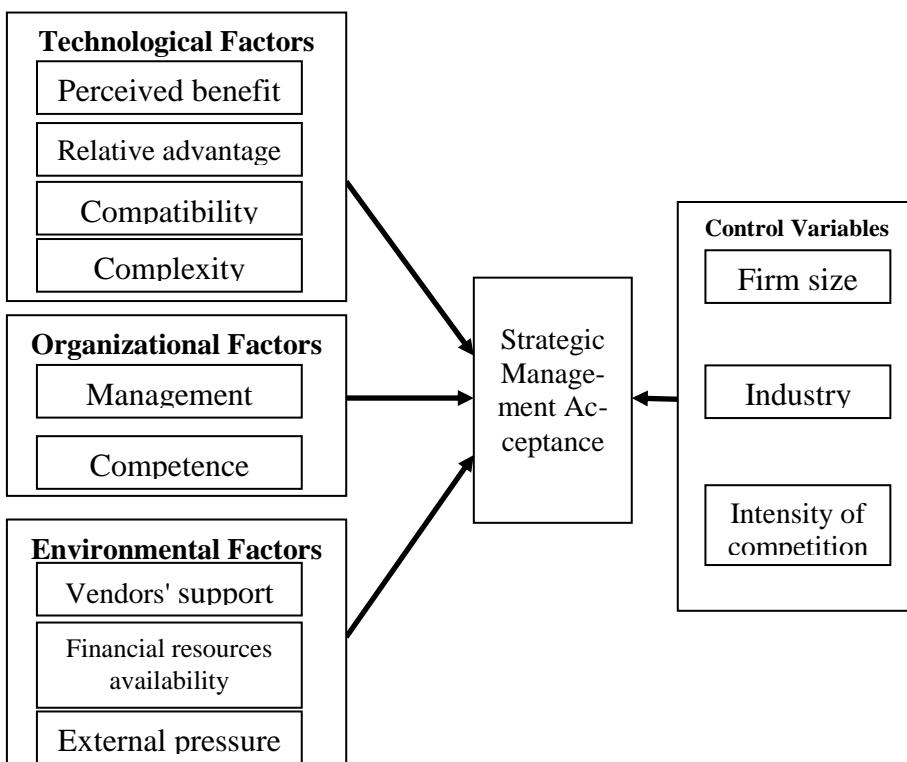


Table 1. Definitions of the variables

Variable	Definition
1 Perceived benefit	Refers to the benefits that strategic management can provide for the adopting organization
2 Relative vantage	The degree to which an innovation is perceived as being better than the idea it supersedes
3 Compatibility	The degree to which strategic management is compatible with all aspects of our business operations
4 Complexity	The possible levels of complexity in the use of such strategic management tools
5 Management support	Refers to the involvement, enthusiasm motivation, and encouragement provided by management towards the acceptance of strategic management tools
6 Competence	Refers to the level of technical expertise available to the organization
7 Vendors' support	Refers to the support for implementing and using strategic management applications that a business obtains from external sources of technical expertise
8 Financial resources availability	The financial position of new ventures and the investment in complex strategic management
9 External pressure	Refers to the influences that a new venture receives from sources external to it
10 Firm size	Firm size was measured by number of workforce
11 Industry type	5 industry types were used to measure this variable
12 Intensity of competition	The intensity of competition in the business was assessed on a Likert scale.
13 Strategic management acceptance	Measures related to the frequency, extent of use, and criticality of the use of such strategic management practices in business operations

Technological Factors

Recent research has recognized that technological factors are not the only key to the effectiveness of strategic management acceptance. However, their role is highlighted in the extant literature. The more knowledge an organization has about strategic management, the more likely it will be to accept and then to adopt strategic insights (see Tanha et al., 2012). Technological factors are also referred to as innovation characteristics in some studies of organizational adoption (Brown & Russell, 2007). In this study, the following factors were identified: (i) Perceived benefit, (ii) Relative advantage, (iii) Compatibility, and (iv) Complexity.

Organizational Factors

Some recent studies have indicated that various organizational factors are likely to have a significant influence on strategic management acceptance (see Salamzadeh et al., 2014). Organizational factors could be defined as all of the hardware, knowledge, attitudes, and skills that exist within the organization in which the strategic insights are to be followed. Based on an extensive literature review and considering the unique context of this study, the following organizational factors are deemed important: (i) management support, and (ii) competence.

Environmental Factors

Environmental factors are those changes in the business environment that create threats as well as opportunities for an organization and are normally out of the control of the managerial staff (Teo et al., 1998). Based on the prior studies and the existing literature, the following environmental factors

were identified: (i) Vendors' support, (ii) Financial resources availability, and (iii) External pressure.

Methodology

The data was gathered through a survey between new ventures in three main cities of Iran. A random sampling method was used using Cochran's formula. Then, based on the formula 100 new ventures should be selected among 137 recognized new ventures as the research population ($n=137$; number of new high tech ventures). After distributing the questionnaires, 96 sound questionnaires were gathered and analyzed. Tables number 2 and 3 show the configuration of the population.

Table 2. Research population

City	Number of New Ventures
Tehran	34
Isfahan	38
Shiraz	65
Total	137

Table 3. Descriptive statistics of the spin-offs

	Categories	Number
Firm size	1-5	58
	5-10	32
	10-50	6
	Above 50	0
Industry type	Biotechnology	6
	IT	8
	Nanotechnology	32
	Robotics	22
	Electronics	28
Intensity of competition	Low	18
	Medium	26
	High	52

A pilot test was initially conducted to enhance the study's content validity. Moreover, the majority of the measures used in the study were taken from previously validated sources (see Table 1). Convergent validity, Average Variance Extracted (AVE), and composite reliability (CR) were examined as well (Table 4). The control variables were assessed as follows: firm size, Industry type, and intensity of competition. PLS smart was used to test the research hypotheses. The AVE values must be above .50; CR and Cronbach's alpha values must be above .70. Table 5 shows that in no case was any correlation between the constructs greater than the squared root of AVE (the principal diagonal element). Thus, the measurement items used for this study demonstrate good convergent and discriminant validities.

Table 4. AVE, CR, and Cronbach's alpha

	AVE	CR	Cronbach's alpha
Management support	.77	.93	.90
Compatibility	.93	.97	.96
Competence	.86	.96	.94
External pressure	.62	.90	.88
Financial resources availability	.73	.88	.83
Relative advantage	.78	.93	.91
Perceived benefit	.79	.92	.87
Vendors' support	.63	.83	.74
Strategic management acceptance	.62	.86	.79
Complexity	.77	.91	.87

Table 5. Inter-construct correlations and the square root of AVE

	1	2	3	4	5	6	7	8	9	10
1	.88	0	0	0	0	0	0	0	0	0
2	.27	.96	0	0	0	0	0	0	0	0
3	.41	.20	.92	0	0	0	0	0	0	0
4	.03	.34	.28	.79	0	0	0	0	0	0
5	.07	.01	.17	.27	.85	0	0	0	0	0
6	.12	.07	.29	.13	.10	.88	0	0	0	0
7	.06	.00	.17	.28	.78	.10	.89	0	0	0
8	.09	.05	.18	.23	.82	.19	.89	.80	0	0
9	.27	.50	.26	.52	.29	.17	.29	.22	.79	0
10	.04	.14	.20	.01	.01	.04	.00	.04	.10	.88

Legend: Management support: 1; Compatibility: 2; Competence: 3; External pressure: 4; Financial resources availability: 5; Relative advantage: 6; Perceived benefit: 7; Vendors' support: 8; Strategic management acceptance: 9; Complexity: 10

Findings and Discussion

In this study, a formal PLS model is provided along with a discussion of the properties of its estimates. Partial least squares using Smart PLS was used to analyze the data and test the hypotheses. PLS recognizes two models: the measurement model and the structural model. The measurement model consists of relationships among the conceptual factors and the measures underlying each construct. It is assessed by examining individual item reliabilities, internal consistency and discriminant validity. It is necessary to test that the measurement model has a satisfactory level of validity and reliability before testing for a significant relationship in the structural model (see Tables 4 and 5).

The structural model gives information as to how well the theoretical model predicts the hypothesized paths or relationships. It is estimated by the path coefficients and the size of the R-squared values. Smart PLS

provides the squared multiple correlations for the endogenous construct in the model and the path coefficients. R-squared indicates the percentage of the variance of the constructs in the model. The path coefficients indicate the strengths of relationships between constructs. Figure 2 shows the structural model. The coefficients could be compared to the ones which belong to other variables. The test of significance of all paths was done using the bootstrap re-sampling procedure. Figure 3 illustrates the t values. As the estimations were done at 95 percent significance level, then the t values should be higher than 1.96. Table 6 shows the characteristics of the model, and the test results. Based on the figures, vendors' support and complexity do not affect the strategic management acceptance. Because their t value is lower than 1.96 and then the hypotheses are not confirmed.

Figure 2. Structural model

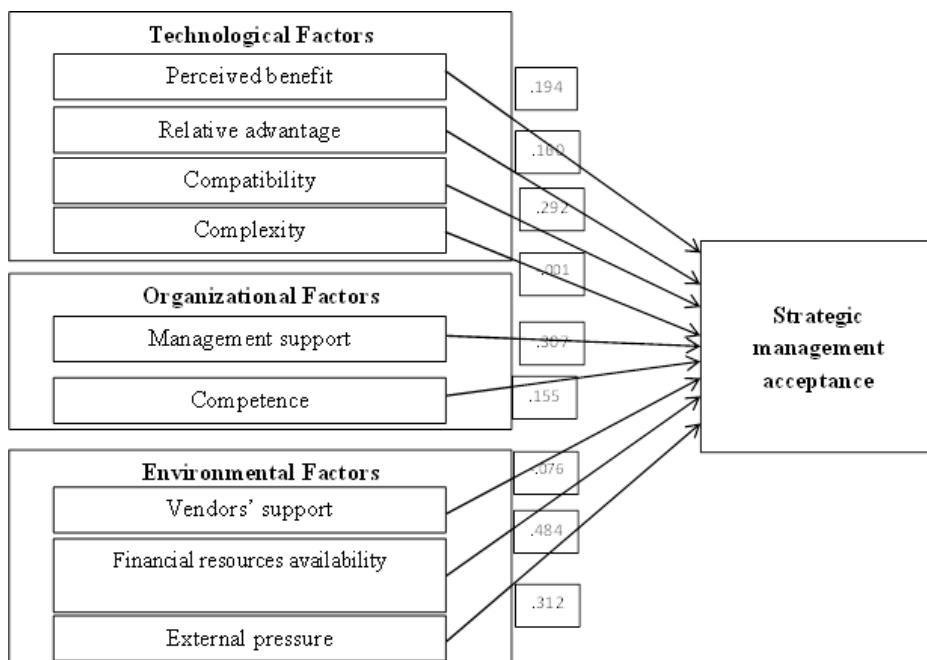
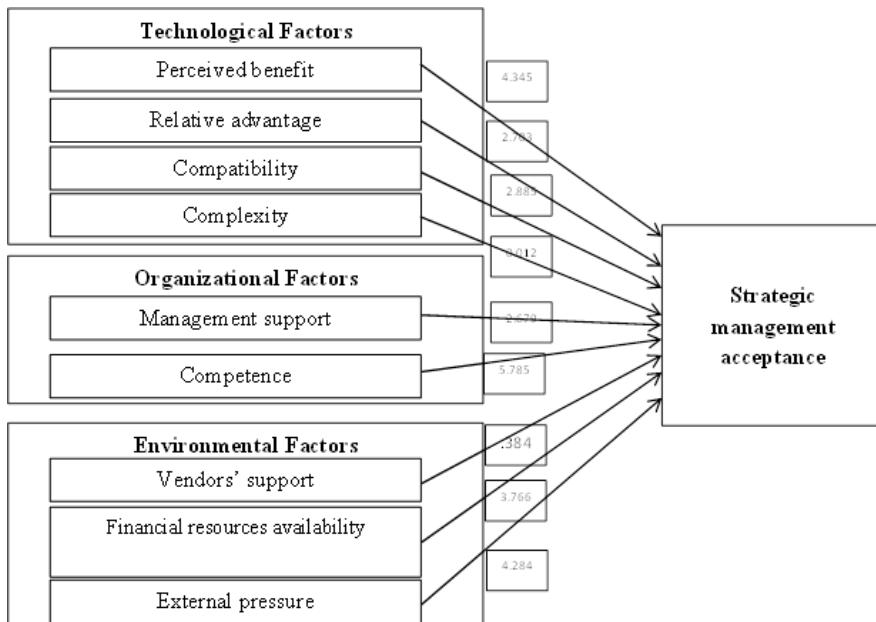


Table 6. Characteristics of the model

	Load ing	Standard deviation	T val- ue
Management support → Strategic management acceptance	.307	.114	2.67
Competence → Strategic management acceptance	.292	.101	2.88
Compatibility → Strategic management acceptance	.156	.087	5.78
External pressure → Strategic management acceptance	.311	.072	4.28
Financial resources availability → Strategic management acceptance	.484	.632	3.76
Relative advantage → Strategic management acceptance	.160	.094	2.67
Perceived benefit → Strategic management acceptance	.194	.564	4.34
Vendors' support → Strategic management acceptance	-.075	.197	.384
Complexity → Strategic management acceptance	-.001	.084	.012

Figure 3. t values



The GOF index is calculated to examine the fitness of the model. The lowest figure for accepting the fitness of the model is 0.36 (Akin et al., 2009), and the GOF index in this model equals to 0.63. Then its fitness is in an acceptable level.

$$GOF = \sqrt{communality \times R^2}$$

$$GOF = \sqrt{0.75 \times 0.53} = 0.63$$

Table 7 shows the result for one-tailed variance analysis. In other words, variables were tested with one-tailed variance analysis to see whether there were significant differences between them or not. The results show that the control variables do not affect the hypotheses.

Table 7. One-tailed variance analysis

Firm size					
	SS	d.f	MS	F	sig
Between groups	1.523	3	0.508	0.804	0.495
Within groups	58.085	92	0.631		
Total	59.609	95			
Industry type					
Between groups	2.516	4	0.629	1.003	0.41
Within groups	57.092	91	0.627		
Total	59.609	95			
Intensity of competition					
Between groups	0.127	2	0.064	0.099	0.906
Within groups	59.482	93	0.64		
Total	59.609	95			

Discussions and conclusion

New ventures are knowledge based companies which are seeking to take advantage of the knowledge created by academics and its steering core (Salamzadeh et al., 2011; Sooreh et al., 2011). One of the main problems is the acceptance of strategic management in such companies. Then, in this paper, the authors tried to investigate the elements which affect their acceptance. Authors used technology-organization-environment (TOE) framework to examine the hypotheses. Based on the findings all the hypotheses were supported, except complexity and Vendors' support. Moreover, control variables did not affect the strategic management acceptance. In other words, no matter how large new ventures are, how intense is the competition, or what the industry type is, the mentioned variables, other than vendors' support and complexity, will affect strategic management acceptance. The findings of the research are in line with prior studies. For instance the importance of management support and competence are discussed in prior

studies. Scholars such as Davis (1989), Ghobakhloo et al. (2011), Aleke et al. (2011) also highlight the importance of perceived benefit, and relative advantage. Moreover, authors such as Ifinedo (2011), and Love et al. (2001) elaborate the role of external pressures, and financial resources availability. However, there are some limitations in the present study. First, lack of access to new ventures in these three cities was a critical issue in this study. Second, future research should benefit from investigating factors and conditions affecting which are not discussed in this research, due to the main focus of the study. Third, this study is limited in having included only three case studies. In the future more cases should be examined, not only of other new ventures and start-ups from just one region.

References

1. Ajzen, I. (1985). From intentions to actions: A theory of planned behavior (pp. 11-39). Springer Berlin Heidelberg.
2. Akin, M., Bloemhof-Ruwaard, J., & Wynstra, F. (2009). The Impact of Supply Chain-Related Factors on Environmental Performance of Manufacturing Firms in Turkey. Paper presented at the 18th IPSERA Conference.
3. Aleke, B., Ojiako, U., & Wainwright, D. W. (2011). ICT adoption in developing countries: perspectives from small-scale agribusinesses. Journal of Enterprise Information Management, 24(1), 68-84.
4. Al-Qirim, N. (2007). A Research Trilogy into E-Commerce Adoption in Small Businesses in New Zealand. Electronic Markets, 17(4), 263-285.
5. Baird, I. S., & Thomas, H. (1985). Toward a contingency model of strategic risk taking. Academy of management Review, 10(2), 230-243.
6. Beaver, G. (2002). Strategy and management in the smaller enterprise. Strategic change, 11(4), 175-181.
7. Brown, I., & Russell, J. (2007). Radio frequency identification technology: An exploratory study on adoption in the South African retail sector. International Journal of Information Management, 27(4), 250-265.

8. Burgelman, R. A. (1983). Corporate entrepreneurship and strategic management: Insights from a process study. *Management science*, 29(12), 1349-1364.
9. Cooper, A. C. (1981). Strategic management: New ventures and small business. *Long range planning*, 14(5), 39-45.
10. Dagnino, G. B., & Padula, G. (2009). Coopetition strategy. *Coopetition strategy: Theory, experiments and cases*, 25-43.
11. Davis Jr, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results (Doctoral dissertation, Massachusetts Institute of Technology).
12. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
13. Dholakia, R. R., & Kshetri, N. (2004). Factors impacting the adoption of the internet among SMEs. *Small Business Economics*, 23(4), 311-322.
14. Dollinger, M. J. (1984). Environmental boundary spanning and information processing effects on organizational performance. *Academy of Management Journal*, 27(2), 351-368.
15. Farsi, J. Y., Modarresi, M., Motavaseli, M., & Salamzadeh, A. (2014). Institutional Factors Affecting Academic Entrepreneurship: The Case of University of Tehran. *Economic Analysis*, 47(1-2), 139-159.
16. Ghobakhloo, M., Arias-Aranda, D., & Benitez-Amado, J., (2011) Adoption of e-commerce applications inSMEs. *Industrial Management & Data Systems*, 111(8), 1238-1269.
17. Ireland, R. D., Hitt, M. A., & Sirmon, D. G. (2003). A model of strategic entrepreneurship: The construct and its dimensions. *Journal of management*, 29(6), 963-989.
18. Ireland, R. D., Hitt, M. A., Camp, S. M., & Sexton, D. L. (2001). Integrating entrepreneurship and strategic management actions to create firm wealth. *The Academy of Management Executive*, 15(1), 49-63.
19. Kapurubandara, M., & Lawson, R. (2006). Barriers to Adopting ICT and e-commerce with SMEs in developing countries: an Exploratory study in Sri Lanka. *University of Western Sydney, Australia*.
20. Keil, T., Maula, M. V., & Wilson, C. (2010). Unique resources of corporate venture capitalists as a key to entry into rigid venture capital syndication networks. *Entrepreneurship Theory and Practice*, 34(1), 83-103.
21. Kraus, S., & Kauranen, I. (2009). Strategic management and entrepreneurship: Friends or foes. *International Journal of Business Science and Applied Management*, 4(1), 37-50.

22. Kraus, S., Reiche, B. S., & Reschke, C. H. (2007). Implications of strategic planning in SMEs for international entrepreneurship research and practice. European Research and Practice, 32(6), 110-127.
23. Kwon, T. H., & Zmud, R. B. (1987). Unifying the fragmented models of information systems implementation', in R. J. Boland and R. A. Hirschheim (eds.), Critical Issues in Information Systems Research, New York: John Wiley & Sons.
24. Larrañeta, B., Zahra, S. A., & González, J. L. G. (2012). Enriching strategic variety in new ventures through external knowledge. Journal of Business Venturing, 27(4), 401-413.
25. Love, P.E.D. & Irani, Z. (2004). An exploratory study of information technology evaluation and benefits management practices of SMEs in the construction industry. Information & Management, 42, 227-242.
26. Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. The Electronic Journal Information Systems Evaluation, 14(1), 110-121.
27. Paarlberg, L. E., & Bielefeld, W. (2009). Complexity Science—An Alternative Framework for Understanding Strategic Management in Public Serving Organizations. International Public Management Journal, 12(2), 236-260.
28. Ren, C. R., & Guo, C. (2011). Middle managers' strategic role in the corporate entrepreneurial process: Attention-based effects. Journal of Management, 0149206310397769.
29. Rogers, E. M. (2004). A prospective and retrospective look at the diffusion model. Journal of Health Communication, 9(S1), 13-19.
30. Salamzadeh, A. (2015). New Venture Creation: Controversial Perspectives and Theories. Economic Analysis, 48(3-4), 101-109.
31. Salamzadeh, A., & Kawamorita Kesim, H. (2015). Startup Companies: Life Cycle and Challenges. In 4th International Conference on Employment, Education and Entrepreneurship (EEE), Belgrade, Serbia.
32. Salamzadeh, A., Salamzadeh, Y., & Daraei, M. (2011). Toward a systematic framework for an Entrepreneurial University: A study in Iranian context with IPOO Model. Global Business and Management Research: An International Journal, 3(1), 31-37.
33. Salamzadeh, Y., Nejati, M., & Salamzadeh, A. (2014). Agility path through work values in knowledge-based organizations: a study of virtual universities. Innovar, 24(53), 177-186.
34. Schepers, J., & Wetzel, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. Information & Management, 44(1), 90-103.
35. Shane, S. (2012). Reflections on the 2010 AMR decade award: delivering on the promise of entrepreneurship as a field of research. Academy of Management Review, 37(1), 10-20.

36. Sooreh, L.K., Salamzadeh, A., Safarzadeh, H., & Salamzadeh, Y. (2011). Defining and Measuring Entrepreneurial Universities: A Study in Iranian context using Importance-Performance Analysis and TOPSIS Technique. *Global Business and Management Research: An International Journal*, 3(2), 182-200.
37. Tanha, D., Salamzadeh, A., Allahian, Z., & Salamzadeh, Y. (2011). Commercialization of University Research and Innovations in Iran: Obstacles and Solutions. *Journal of Knowledge Management, Economics, and Information Technology*, 1(7), 126-146.
38. Teo, T. S., Tan, M., & Buk, W. K. (1998). A contingency model of Internet adoption in Singapore. *International Journal of Electronic Commerce*, 2, 95-118.
39. Tornatzky, L. & Fleischer, M. (1990) The process of technology innovation. Lexington, MA, Lexington Books.
40. Venkataraman, S. (1997). The distinctive domain of entrepreneurship research. *Advances in entrepreneurship, firm emergence and growth*, 3(1), 119-138.
41. Wymer, S. A., & Regan, E. A. (2005). Factors Influencing e-commerce Adoption and Use by Small and Medium Businesses. *Electronic Markets*, 15(4), 438-453.
42. Zahra, S. A. (2008). Being entrepreneurial and market driven: implications for company performance. *Journal of Strategy and Management*, 1(2), 125-142.
43. Zahra, S., & Dess, G. G. (2001). Entrepreneurship as a field of research: Encouraging dialogue and debate. *Academy of Management Review*, 26(1), 8-10.
44. Zarea, H., & Salamzadeh, A. (2012). Identification of Output Performance Indicators in Commercialization of University Research: An AHP based Study of EFQM Model. *Journal of Entrepreneurship Development*, 4(15), 85-104.