

# RELATIONSHIP BETWEEN ENTREPRENEURS' MANAGERIAL COMPETENCIES AND INNOVATIVE START-UP INTENTIONS IN UNIVERSITY STUDENTS: AN IRANIAN CASE

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## ABSTRACT

*This study is aimed to investigate the relationship between entrepreneurs' managerial competencies and innovative start-up intentions among university students in Iran. Entrepreneurs' managerial competencies have been scarcely focused in previous studies on factors affecting start-up intentions. Seven independent factors such as administrative competency, knowledge and technologies, communication skills, network building competency, business model development competency, creativity and innovativeness, and attaining finance capability were adopted for the development of the hypotheses. Start-up intentions as dependent factors were divided into self-employing and innovative start-up intentions. Based on the result, administrative competencies, knowledge and technology, and creativity and innovativeness were significant for both innovative and self-employing start-up intentions while network building, business model development and attaining finance competencies were significant only for innovative start-up intentions. This result reveals that innovative start-up intentions in university students are influenced by more diverse competency related factors than in self-employing start-up intentions.*

**Keywords:** Entrepreneurship, Managerial Competencies, Start-Up Intentions, Self-Employing Start-Ups, Innovative Start-Ups.

## INTRODUCTION

Promoting entrepreneurship and start-up intentions are considered critical factors not only for economic growth but also for contributing to the adaption of new knowledge and technology into the national economies. In this regard, the development of entrepreneurship and start-up intentions is heavily emphasized in a knowledge-based economy and in turn university students' start-up intentions are highlighted by policy makers as a means to solve the problem of high unemployment rate in many countries (Turker and Selcuk 2008; Leong 2008; Nabi and Liñán 2011). This study focused on entrepreneurs' managerial competencies that have been scarcely dealt with in previous studies on factors affecting start-up intentions and that can be especially sensitive for university students who would like to initially begin their start-ups. In particular, the relationship between the entrepreneurs' managerial competencies such as administrative competencies, knowledge and technologies, network building competencies, communication skills, business model development and attaining finance capability and start-up intention including self-employing and innovative were investigated.

Fostering entrepreneurs' managerial competencies is a very important factor in developing educational systems in order to enhance student's start-up intentions. However, many questions in regard to the influences of entrepreneurs' managerial competencies on individuals' start-up intentions are remained to date unanswered (Krueger and Brazeal 1994). Specifically, questions about the effect of entrepreneurs' managerial competencies on self-employing or innovative start-up intentions are investigated separately in this study. Self-employing or solo-self-employed entrepreneurs are defined as individuals who prefer to set up their business individually and introduce their own capital, ability and business acuity to run the enterprise successfully whereas innovative start-up means an independent innovators who synthesize new ideas and diverse information and in turn introduce new products, services, technologies and markets through the perception of opportunities (Danhof 1949; Vesper 1980).

In recent decades, Iranian government has showed an increasing interest in promoting entrepreneurship among university students. In addition, the government has highly prioritized policies supporting entrepreneurs and entrepreneurship which is directly related to the necessity of new industry development for economic growth as a developing country and finding out alternative solution for the high unemployed rate of university graduates. Actually, a report shows that entrepreneurship in Iranian university students has increased between the years 2000 to present more than ever (Keyhani and Jafari Moghadam 2008). However, the aspects of what should be educated to promote university students entrepreneurship effectively in terms of managerial competencies have not often been dealt with in previous studies. Therefore, this study focus on 'entrepreneurs' managerial competencies that are essentially required to provoke university student startup intentions. The result of this study in particular can contribute to the improvement or new development of education system to promote entrepreneurship.

This study was conducted in Iranian universities where the average entrepreneurs are young university graduates with more than 50% of between twenty-five and forty-four years of age. (GEM 2014; Zali 2014). For this purpose, a structured questionnaire was developed by framing relevant questions under each of the seven core independent factors and a survey on university students was conducted. The questions were developed based on previous studies and were then distributed to university students in top Iranian universities to analyze the relationship between the seven independent factors and start-up intentions. Statistical method such as exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and Partial Least Square regression were applied to analyze the relationship between selected factors.

This paper is composed of four chapters. The first chapter is introduction and the second chapter presents research background and the result of literature review. The process of hypotheses building is explained in this chapter too. In addition, description of the sample, the method of the study, and the result of analysis are presented in the third chapter. The forth chapter is discussion on the result of this study and concluding remarks.

## **BACKGROUND**

### **Literature Review**

Entrepreneurial intentions do a very important role in the prediction of future entrepreneurial actions (Kantz and Gartner 1988; Krueger and Carsrud 1993; Elenurm and Alas 2009). Many scholars have argued about various factors affecting entrepreneurial intentions particularly among university students as potential entrepreneurs (Kolvereid 1996; Liñán and Chen

2009; Justice 2014). In this regard, several models have been proposed to assess the influence of personality traits (Louw et al. 2003), abilities (Zampetakis and Moustakis 2006), self-efficacy (Bonnett and Furnham 1991), attitudes (Zampetakis et al. 2009) and demographic factors (Mattews and Moser 1996; Wang and Wong 2004) on university students' entrepreneurial intentions. These factors often focus on uncompromising traits and the fixed behaviors of individuals (Krueger et al. 2000). Later on, by way of the introduction of a competency approach into the entrepreneurship literature, entrepreneurial competencies became a more attractive alternative factor to the study of start-up intentions.

### **Entrepreneurs' Managerial Competencies**

Competencies are defined as integrated components of knowledge, skills and attitudes (Bird 2002; Man et al. 2002; Wagener et al. 2010; Kyndt and Beart 2015; Volery et al. 2015). Many studies have been conducted to find the essential competencies needed for entrepreneurs to run a successful business (Man et al. 2002; Markman and Baron 2003; Karlsson and Honig 2009; Chwolka and Raith 2012; Kyndt and Beart 2015; Izquierdo et al. 2005). Man et al. (2002) identified several competencies which entrepreneurs necessarily need in order to be competent in a competitive business environment. Those are opportunity competency, relationship competency, conceptual competency, organizing or managerial competency, strategy competency, commitment competency, learning competency and personal competency. Furthermore some other competencies i.e. technical and functional competency, social responsibility competency, and ethical competency were proposed by Chandler and Jansen (1992).

Woodruff (1992) defined Managerial competence as an umbrella under which everything fits, what may directly or indirectly relate to job performance. Spencer and Spencer (1993) stated that the managerial competencies are a specialized subset of the competencies, expressing the intention to have certain specific effects which are particularly important for managers. However, managerial competencies have no consensus in what the concept is and what components creates them in previous studies. In this study, the 'entrepreneurs' managerial competencies' were newly defined for this study as a concept explaining 'managerial competencies required for entrepreneurs who initially begin their start-ups', mixing two concepts of 'entrepreneurial competencies' and 'managerial competencies' in previous studies. The entrepreneurs' managerial competencies in this study includes administrative competency (Cho and Gumeta, 2015; Kim and Cho, 2014; Boyatzis 1982), knowledge and technology connected to the work (Cho and Gumeta, 2015; Kim and Cho, 2014), skills to communicate with people (Iksana et al., 2012; Baron and Markman, 2003), abilities to build networks (Kyndt and Baert, 2015) and to develop competitive business models (Tece, 2010; Arranz et al., 2016), and getting financing (Katila et al., 2008).

Linking between entrepreneurs' managerial competencies and start-up intentions in university students is imperative for theoretical and empirical studies, since entrepreneurs' managerial competencies can be fostered and learned through formal education, coaching, training and experiences (Man et al. 2002; Brownell 2006; Volery et al. 2015; Wagener et al. 2010; Kyndt and Baert 2015). Moreover, students having certain competencies may naturally favor different types of start-up that lead them to choose more suitable careers and beneficial businesses.

### **Start-Up Intentions**

Intentions have been explained as a self-prediction to a specific behavior (Ajzen and

Fishbein 1973; Ajzen 1991; Ajzen 2002), which employ the motivational factors affecting behaviors and indicate individuals' effort to put these behaviors into practices. Therefore, the higher the intended behavior of persons can directly result in the higher the individuals' plan to act (Krueger 1993; Bagozzi et al. 1989; Veciana et al. 2005; Liñán and Santos 2007). Start-up intention of university students are students' inclination to establish their own business within five years after graduation (Müller 2008). Start-up and self-employing intentions are linked (Kolvereid and Isaksen 2006) and attitude is the core of both (Gelderen et al. 2008). An attitude towards self-employment is an individual perception of working for oneself or owning a business (Jacson and Rodkey 1994; Kolvereid and Isaken 2006; Pihie and Akmaliah 2009). Self-employment comprises a wide variety of activities including innovative and self-employing. The motivator of innovative and self-employing activities is intention to be independent (Martinez and Vila 2007; Román et al. 2011). Fristch (2011) claimed that entrepreneurs perform innovative start-ups when they create novel products, new markets or processes, while self-employed is defined as a person who prefers a regular career using an existing business model.

The differences between innovative and self-employing start-up intentions are important (Cho and Gumeta, 2015; Kim and Cho, 2014) because different types of start-ups result in different level of productivity in economy (Stam and van Stel 2011). It is often assumed that self-employed entrepreneurs display less entrepreneurial competencies than their innovative counter-parts and have less influence on economic growth (Baumol 1990; Wiklund and Shepherd 2003; Hessels et al. 2008).

## **Developing Hypotheses**

As mentioned earlier, competency is a combination of knowledge, skills, ability (Mirabile 1997; Hoffmann 1999; Kaur and Kumar 2013) and attitudes (Izquierdo et al. 2005; Phelan and Sharply 2011) which are necessary to perform entrepreneurial tasks (Bird 1995). This study employs competencies aforementioned by scholars and considers components of competency to select probable effective entrepreneurial competencies to start-up intentions. For this purpose, administrative competency, knowledge and technology, communication skills, network building competency, business model development competency, creativity and innovativeness and attaining finance capability adopted as independent factors in order to examine their effect on start-up intentions with respect to self-employing and innovative. The following hypotheses were developed from these framework.

### **Administrative Competency**

Any person in charge of running a business should possess administrative competency which includes both organizational or managerial and technical competencies. Evidence shows a direct relationship between entrepreneurs' administrative competencies and a firms' performance (Berryman 1983; Gaskill et al. 1993; Chandler and Hanks 1994; Baldwin et al. 2000; Tushabomwe-Kazooba 2006). In addition, administrative experiences, motivations and skills are necessary in determining the success or failure of a firm (Arasti et al. 2014). Many previous studies confirm that the lack of administrative competencies has an impact on a business' success or failure (Gaskill et al. 1993; Baldwin et al. 2000; Tushabomwe-Kazooba 2006). Administrative competencies similar to other competencies can be developed through formal education. Fostering administrative competencies would enhance the probability of increasing the number of

entrepreneurs and the choice for self-employment (Blumberg and Pfann 2016).

*Hypothesis 1(H1a): University students who have higher administrative competency will have higher self-employing start-up intentions.*

*Hypothesis 2(H1b): University students who have higher administrative competency will have higher innovative start-up intentions.*

### **Knowledge and Technology Competency**

Knowledge is a set of paradigms which are defined as patterns of solutions for particular technical issues including specific technologies and experiences. Technology is a combination of knowledge distributed in products and processes to create technological inventions, knowledge and products. Knowledge and technology competency include a wide range of knowledge and skills which enables entrepreneurs to be successful in creating innovative products and services (Dosi 1982; Nerkar and Roberts 2004), as well as essential competencies for business founders in technical and functional roles in a knowledge-based economy (Kaur and Kumar 2013; Kaur and Bains 2013).

*Hypothesis 3(H2a): University students who have higher knowledge and technology competency will have higher self-employing start-up intentions.*

*Hypothesis 4(H2b): University students who have higher knowledge and technology competency will have higher innovative start-up intentions.*

### **Communication Skills**

Communication is defined as a process of sharing and exchanging ideas and information with a specific objective between individuals through diverse methods and channels such as verbal communication, non-verbal communication, written communication and giving feedback (Iksan et al. 2012). Communication skills are key success factors for entrepreneurs in a variety of situations such as convincing their business partners and presenting ideas, plans or products when dealing with clients and the like (McClelland 1987; Baron and Markman 2003; Davidsson and Honig 2003; Brush 2008; Wagener et al. 2010; Kaur and Bains 2013; Kyndt and Baert 2015). In this regard, developing students' communication skills through activities from the early stage at universities (Harlak et al. 2008) can robust students to encounter challenges in their future start-ups (Morreale et al. 2000). Please attach start-up together and delete the created space. Previous studies on communication skills among university students confirmed that affirmative communication environment have positively effect on communication skills. Therefore, giving communication opportunities to university students in order to prepare them for business challenges is one of the key role of universities (Ihmeideh et al. 2010; Cleland, et al. 2005).

*Hypothesis 5(H3a): University students who have higher communication skills will have higher self-employing start-up intentions.*

*Hypothesis 6(H3b): University students who have higher communication skills will have higher innovative start-up intentions.*

### **Network Building Competency**

One of the important capabilities of an entrepreneur is to make internal and external relevant networks to utilize information, knowledge and technology in generating innovation. Maintaining these networks is also key due to the importance of recruiting and retaining clients (Man et al. 2002; Baron and Markman 2003; Markman and Baron 2003; Kyndt and Baert 2015), exploiting complementary resources and capabilities as well (Deeds and Hill 1996; Johnson and Sohi 2003; Shan et al. 1994). Network building competency enables entrepreneurs to pave the way for establishing a new business (Lin and Chang 2010; Hatala 2007). Since start-ups are often at risk of failing in the early-stages, establishment of beneficial relations with other organizations and enterprises can be a way to increase the likelihood of continued survival and sustainability (Wu 2007).

*Hypothesis 7(H4a): University students who have higher network building competency will have higher self-employing start-up intentions.*

*Hypothesis 8(H4b): University students who have higher network building competency will have higher innovative start-up intentions.*

### **Business Model Development Competency**

Business model development is an essential prerequisite to increasing the chances of success in a new business start-up, although developing a successful business model is not sufficient alone to achieve competitive advantage (Wheadon and Duval-Couetil 2014). Entrepreneurs need an adequate degree of innovation in designing and developing business models which lead up to new inimitable products or services (Teece 2010). Developing business models and strategic plans are basic and specific capabilities of entrepreneurs to start-up a project (Boissin et al. 2009; Arranz et al. 2016). This competency can be improved through education in business creation among university students (Arranz et al. 2016).

*Hypothesis 9(H5a): University students who have higher business model development competency will have higher self-employing start-up intentions.*

*Hypothesis 10(H5b): University students who have higher business model development competency will have higher innovative start-up intentions.*

### **Creativity and Innovativeness Competency**

Entrepreneurship is a creative and innovative response to the environment which can take place in a variety of fields (Okpara 2007). In the modern economy leading with knowledge and technology, the requests for creative and innovative entrepreneurs are felt more than ever before and this trajectory will no doubt continue. Indeed, entrepreneurs are regarded as the engine for sustainable economic growth because of their creativity and innovative capabilities in entrepreneurial process guiding them to surpass their goals (Lee et al. 2004). Creative thinking can produce innovative ideas by the composition and deformation of existing ideas offered by Harris (1988). Start-up involves the employment of these ideas to deliver new products and services to the market (Ambile 1996; Gurteen 1998). Accordingly many scholars have found significant relations between creativity and entrepreneurial opportunities (Hills et al. 1997; Lumpkin et al. 2003).

*Hypothesis 11(H6a): University students who have higher creativity and innovative competency will have higher self-employing start-up intentions.*

*Hypothesis 12(H6b): University students who have higher creativity and innovative competency will have higher innovative start-up intentions.*

### **Attaining Finance Capability**

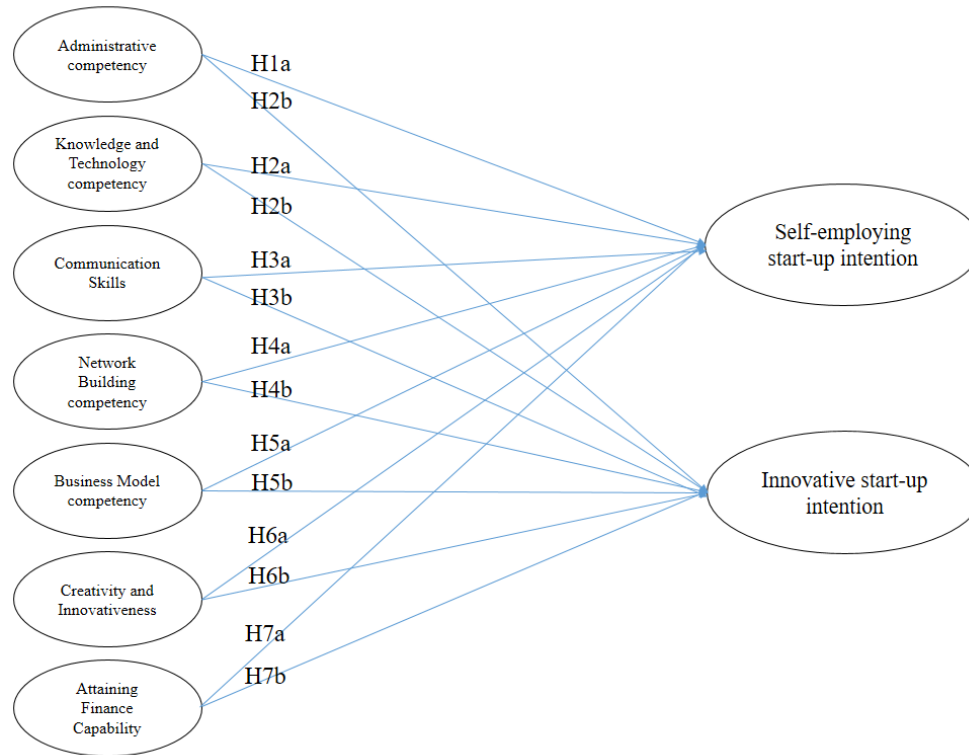
Providing financial resources is one of the most important and challenging elements in a business start-up phase. Since innovative activities are often costly, young innovators and entrepreneurs who have recently graduated frequently have a high need of external financial resources (Autio et al. 2001; Collins et al. 2004; Wang et al. 2011). As a result, funding and capital are two controversial topics and the primary concern of entrepreneurship (Blumberg and Pfann 2016). Estimating start-up costs for operations and capital expenditure are also essential capabilities for entrepreneurs.

New business funders not only should consider financing from many different sources, but also they must be able to make decisions on financial issues and the assessment of their business (Man et al. 2002). Katila et al. (2008) in his studies noted attaining finance resources as a key task for a successful venture. However, it is not possible for many young entrepreneurs especially who are newly graduated from universities to easily acquire funding because they lack both experience and connections.

*Hypothesis 13(H7a): University students who have a better ability of attaining finance capability will have higher self-employing start-up intentions.*

*Hypothesis 14(H7b): University students who have a better ability of attaining finance capability will have higher innovative start-up intentions.*

Based on the theoretical background mentioned before, a research model is developed as depicted in Figure 1.



**FIGURE 1**  
**RESEARCH MODEL**

## EMPIRICAL STUDY

### Data Collection

The data used in this study was gathered between November and December of 2015 using both paper-based (offline) and paperless (online) questionnaires in Iranian universities. The questionnaire was developed by framing relevant questions under each of the seven core independent factors and two dependent factors identified from previous literature. The first part of the questionnaire was consisted of 35 questions related to entrepreneurial competencies and 10 for analyzing positive attitudes of entrepreneurs towards innovative and self-employing start-ups.

The second part of the survey captured the demographic profile of the respondents. The data was collected through approximately 230 online surveys via Google Docs and 70 hard copy papers. A total number of 285 completed responses were returned yielding a response of 95%, (15 missing response). We received no incomplete responses online because all scale questions were mandatory in order to submit the survey, and comments were optional. In the case of paper-based questionnaires we used only those with fully completed answers for analysis. The demographic profile of the respondents consisted of gender (male 55% and female 45%), age (the majority of the respondents were found to be of less than twenty-five years old), university (most of the respondents belonged to Tehran University and Sharif University, whereas the rest of the



respondents belonged to other public and private universities of Iran), the majority of respondents and their educational status was as presented in Table1. More than half of the respondents were interested in starting their own business within 10 years after graduation. Moreover the tendency to start a business in the field of manufacturing was lower than that of services field.

|                 | <b>Frequency(percentage)</b> |                                    | <b>Frequency(percentage)</b> |
|-----------------|------------------------------|------------------------------------|------------------------------|
| <b>Gender</b>   |                              | <b>Educational level</b>           |                              |
| Male            | 128(44.9)                    | Undergraduate                      | 230(80.7)                    |
| Female          | 157(55.1)                    | Master                             | 42(14.7)                     |
|                 |                              | PhD.                               | 13(4.6)                      |
| <b>Age</b>      |                              | <b>University</b>                  |                              |
| <=25 years      | 246(86.3)                    | Tehran University                  | 109(38.2)                    |
| 25-30 years     | 22(7.7)                      | Sharif University of Technology    | 79(27.7)                     |
| >30             | 17(6.0)                      | Shahid BeheshtyTehran              | 14(4.9)                      |
|                 |                              | K.N.Toosi University of Technology | 16(5.6)                      |
|                 |                              | Isfahan University of Technology   | 11(3.9)                      |
|                 |                              | Science and Research of Tehran     | 35(12.3)                     |
|                 |                              | Private University                 | 21(7.4)                      |
| <b>Major</b>    |                              | <b>Intention to start-up</b>       |                              |
| Technical       | 121(42.5)                    | Just after graduation              | 135(46.7)                    |
| IT Engineering  | 44(15.4)                     | 10 Years after graduation          | 150(53.3)                    |
| Agriculture     | 12(4.2)                      | <b>Industry interested</b>         |                              |
| Natural science | 22(7.7)                      | Manufacturing                      | 111(39.0)                    |
| Social science  | 11(3.9)                      | Services                           | 174(61.0)                    |
| Management      | 75(26.3)                     |                                    |                              |

N=285

## Questionnaire Development

The questionnaire used in this study was developed as listed in Table 2. Most items of the factors are adopted from previous studies to establish the content validity of the measurements. However, some questions that were essentially required for this study were newly developed by authors in this study through conversation with two scholars who had PhD degree in entrepreneurship or business management areas. The first version of the questionnaire developed was pre-tested to check the initial expression and the quality of translation and in order to minimize misinterpretation in the real survey. The questionnaire was distributed among Iranian graduate students in South Korea for pre-test. The aims and procedures of the study were explained and the manuscript in both English and Persian language was provided to the respondents in the pre-test. The questionnaire was partially revised reflecting feedback from the respondents. A self-assessment form on a seven point Likert Scale including seven levels of choices from “strongly disagree” to “strongly agree;” was applied as scoring method. The final questionnaire with an introduction into the aims of the study emphasizing the confidentiality of their responses was distributed among students of diverse universities in Iran.

For this research, an Exploratory Factor Analysis (EFA) was conducted on the collected data using SPSS V.23 software package for all items to uncover the underlying structure of variables. The result of EFA on independent factors showed seven factors structure as intended and the total variance was 71.38%. Confirmatory Factor Analysis (CFA) was also carried out to find the relationship between independent factors and their latent constructs (Byrne, 2012) The Partial

Least Square (PLS) regression for the analysis of Structural Equation Modeling (SEM) was applied to validate the measurement and test the hypotheses established in this study (Fornell and Cha 1994) following the two steps approach in the analysis of structural equation modeling (Eikebrokk and Olsen, 2007). PLS is a second generation multivariate technique which is used to evaluate the relationships between constructs and their corresponding indicators with the aim of minimizing the error variance (Chin 1998; Gil-Garcia 2008) and is generally applied on models with reflective constructs, non-normality distribution of data and small sample size (Goodhue et al. 2012; Kock 2016). In addition, PLS can be applied when the number of observation is small and the correlation statistics suggest no problem of multi collinearity according to Reinartz et al. (2009). Therefore, the PLS method was adopted to test the research model in this study because the data collected in this study did not support normality assumption in distribution ( $p < 0.01$  based on the K-S test). This study employed the software Smart PLS 2.0 M3 (Ringle et al. 2005) for the analyses.

### Reliability and Validity

In order to evaluate internal consistency the Composite Reliability (CR) that should be greater than 0.7 was checked (Hensler et al. 2009; Hair et al. 2011). Table 2 presents that the minimum CR is 0.89 showing the internal consistency of scales is acceptable (Straub 1989). Two indicators of self-employing start-up intention constructs were eliminated due to the factor loadings lower than 0.4 (Hensler et al. 2009). Convergent validity which requires an Average Variance Extracted (AVE) higher than 0.5 (Fornell and Larcker 1981) was also analyzed as represented in Table 2. The values of the AVE were between 0.63 and 0.75 which are above the threshold value (Hair et al. 2010). We also analyzed the discriminant validity of the scales. Table 3 shows that all constructs correlations derived from the data were significant and the square roots of the AVE for each construct were greater than the correlation between any pair of factors, confirming the discriminant validity of the scale. As a result, the model indicated good internal consistency, indicator reliability, convergent and discriminant validity.

| Constructs  | Factor loading | Mean (SD)          | Alpha | Reference   |
|---|----------------|--------------------|-------|---|
| <b>Administrative Competency</b>                                    |                |                    |       |   |
| I can manage my startup company                                     | 0.891          | 5.283<br>(1.1233)  | 0.871 | Cho & Gumeta 2015;<br>Kim & Cho 2014;<br>Gaskill et al. 1993;<br>Chandler & Hanks 1994;<br>Baldwin et al. 2000;<br>Kazooba 2006 |
| I can manage my employees' job activities                           | 0.864          |                    |       |   |
| I can manage fiscal works for business                              | 0.751          |                    |       |   |
| I can manage operations, marketing works for business               | 0.792          |                    |       |   |
| I can motivate and evaluate my employees                            | 0.757          |                    |       |   |
| <b>Knowledge and Technology Competency</b>                          |                |                    |       |   |
| I have appropriate knowledge or technologies for my business        | 0.73           | 5.3115<br>(1.1603) | 0.850 | Cho & Gumeta 2015;<br>Kim & Cho 2014;<br>Kaur & Bains 2013;<br>Kaur & Kumar 2013  |
| I believe that my knowledge or technology is useful for my business | 0.875          |                    |       |   |
| My knowledge or technology is competitive for my business           | 0.972          |                    |       |   |
| I can use my knowledge or technology for my business                | 0.793          |                    |       |   |
| My knowledge or technology can be core capabilities                 | 0.803          |                    |       |   |

|  |       |                    |       |   |
|--|-------|--------------------|-------|---|
| for my business  |       |                    |       |   |
| <b>Communication Skill</b>   |       |                    |       |   |
| I can communicate with others for my business                        | 0.842 | 5.270<br>(1.0489)  | 0.861 | Wagener et al. 2010;<br>Iksana et al. 2012;   |
| I can convince others in business communications                     | 0.781 |                    |       |   |
| I can make cooperative relationship with others                      | 0.776 |                    |       |   |
| I can use documents or reports for communications                    | 0.677 |                    |       |   |
| I can use diverse media channels for communications                  | 0.684 |                    |       |   |
| <b>Network Building Competency</b>                                   |       |                    |       |   |
| I can build diverse cooperative networks for business                | 0.651 | 4.879<br>(1.1763)  | 0.855 | Kyndt & Baert 2015;<br>Lin & Chang 2010;<br>Hatala 2007   |
| I know how to manage diverse business networks.                      | 0.824 |                    |       |   |
| I can use diverse networks for my business.                          | 0.848 |                    |       |   |
| I am accessible to diverse online and offline networks.              | 0.702 |                    |       |   |
| I know who can be helpful for my business.                           | 0.743 |                    |       |   |
| <b>Business Model Development Competency</b>                         |       |                    |       |   |
| I can develop a business model.                                      | 0.865 | 4.849<br>(1.2395)  | 0.874 | Teece 2010;<br>Herbert 2000;<br>Arranz et al. 2016  |
| I can convert my ideas into a useful business                        | 0.891 |                    |       |   |
| I can convert my knowledge or technology into a useful business      | 0.891 |                    |       |   |
| I know how I can fulfill key success factors for business            | 0.714 |                    |       |   |
| I have the capability to fit my product or service to customer needs | 0.663 |                    |       |   |
| <b>Creativity and Innovativeness Competency</b>                      |       |                    |       |   |
| I am innovative or creative  | 0.865 | 5.133<br>(1.1406)  | 0.906 | Harris 1988;<br>Ambile 1996;<br>Gurteen 1998;<br>Lee et al. 2004  |
| I am familiar with making something new or different                 | 0.850 |                    |       |   |
| I enjoy exploiting new ideas to solve problems                       | 0.863 |                    |       |   |
| I have the capability to make something better                       | 0.875 |                    |       |   |
| I have diverse useful ideas for my work or business                  | 0.811 |                    |       |   |
| <b>Attaining Finance Capability</b>                                  |       |                    |       |   |
| I can raise required funding for a business                          | 0.744 | 5.5042<br>(1.1226) | 0.907 | Man et al. 2002;<br>Katila et al. 2008;<br>Autio et al. 2001;<br>Collins et al. 2004;<br>Wang et al. 2011 |
| I know where and how I can get financing for a business              | 0.892 |                    |       |   |
| I can use diverse investors for a business                           | 0.853 |                    |       |   |
| I know how I can use external resources for a business               | 0.87  |                    |       |   |
| I have a capability to invite investors for a start-up               | 0.849 |                    |       |   |
| <b>Self-employing Start-up Intention</b>                             |       |                    |       |   |
| I am interested in common business items rather than innovative ones | 0.885 | 3.800<br>(1.4302)  | 0.837 | Cho & Gumeta 2015;<br>Kim & Cho 2014;<br>Jackson & Rodkey 1994;<br>Kolverid & Isaksen 2006                |
| I have a positive attitude on a self-employing startup               | 0.839 |                    |       |   |
| I regard my startup as a job for my living                           | 0.720 |                    |       |   |
| <b>Innovative Start-up Intention</b>                                 |       |                    |       |   |
| I am interested in an innovative startup                             | 0.894 | 4.788<br>(1.3191)  | 0.884 | Cho & Gumeta 2015;<br>Kim & Cho 2014;<br>Fritsch 2011;<br>Martinez & Vella 2007;<br>Roman et al. 2011     |
| I have a start-up intention with innovative ideas                    | 0.906 |                    |       |   |
| I prefer a start-up in new or emerging industries                    | 0.836 |                    |       |   |
| I regard my start-up as a challenge for my goal achievement          | 0.723 |                    |       |   |
| I have a positive attitude to challenging start-up with innovative   | 0.766 |                    |       |   |

| <b>Construct</b>                         | <b>CR</b> | <b>AVE</b> | <b>1</b>     | <b>2</b>     | <b>3</b>     | <b>4</b>     | <b>5</b>     | <b>6</b>     | <b>7</b>     | <b>8</b>     | <b>9</b>     |
|--|-----------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Administrative Competency                | 0.906     | 0.660      | <b>0.813</b> |              |              |              |              |              |              |              |              |
| Knowledge and Technology Competency      | 0.896     | 0.634      | 0.376        | <b>0.796</b> |              |              |              |              |              |              |              |
| Communication Skills                     | 0.900     | 0.642      | 0.693        | 0.383        | <b>0.801</b> |              |              |              |              |              |              |
| Network Building Competency              | 0.896     | 0.634      | 0.578        | 0.340        | 0.622        | <b>0.796</b> |              |              |              |              |              |
| Business model development Competency    | 0.909     | 0.669      | 0.626        | 0.437        | 0.468        | 0.601        | <b>0.818</b> |              |              |              |              |
| Creativity and Innovativeness Competency | 0.930     | 0.727      | 0.411        | 0.596        | 0.438        | 0.279        | 0.404        | <b>0.853</b> |              |              |              |
| Attaining finance Capability             | 0.931     | 0.731      | 0.295        | 0.023        | 0.217        | 0.309        | 0.431        | 0.187        | <b>0.855</b> |              |              |
| Self-employing Start-up Intention        | 0.902     | 0.754      | 0.428        | 0.401        | 0.322        | 0.447        | 0.396        | 0.353        | 0.203        | <b>0.869</b> |              |
| Innovative Start-up Intention            | 0.916     | 0.686      | 0.431        | 0.503        | 0.432        | 0.322        | 0.340        | 0.603        | 0.185        | 0.506        | <b>0.828</b> |

All latent variables correlations are statistically significant at  $\alpha=0.01$ .

### Hypothesis Test

After verifying the validation of the measurement model, the bootstrapping method (500 resamples) was employed to determine the significance levels for loadings to test the proposed hypotheses (Chin 1998; Gil-Garcia 2008). As presented in Table 4 (A, B), standardized coefficient and t- values were used to calculate the hypotheses. For the purpose of assessing the predictive capacity of the structural model, we calculated R square that is the variance explained by the exogenous variables (Barclay et al. 1995). The dependent constructs were above 0.2 which is above the required criterion level proposed by Chin (1998).

As results, administrative competencies, knowledge and technology, and creativity and innovativeness were significant in the relationship with self-employing start-up intentions respectively. In addition, in the relationship with innovative start-up intentions, most influencing competencies such as administrative competencies, knowledge and technology, creativity and innovativeness, network building competencies, business model development and attaining finance were sorted as significant factors.

| <b>Dependent factor: Self-employing start-up intentions</b> | <b>Beta</b> | <b>t-value</b> | <b>Result</b> |
|---|-------------|----------------|---------------|
| H1a Administrative competency                               | 0.313       | **5.592        | Supported     |
| H2a Knowledge and technology competency                     | 0.268       | **5.644        | Supported     |
| H3a Communication skills                                    | -0.054      | 0.919          | Not Supported |
| H4a Network building competency                             | 0.096       | 1.705          | Not Supported |

|  |       |         |               |
|--|-------|---------|---------------|
| H5a Business model development competency    | -0.03 | 0.47    | Not Supported |
| H6a Creativity and innovativeness competency | 0.19  | **3.406 | Supported     |
| H7a Attaining finance capability             | 0.018 | 0.412   | Not Supported |

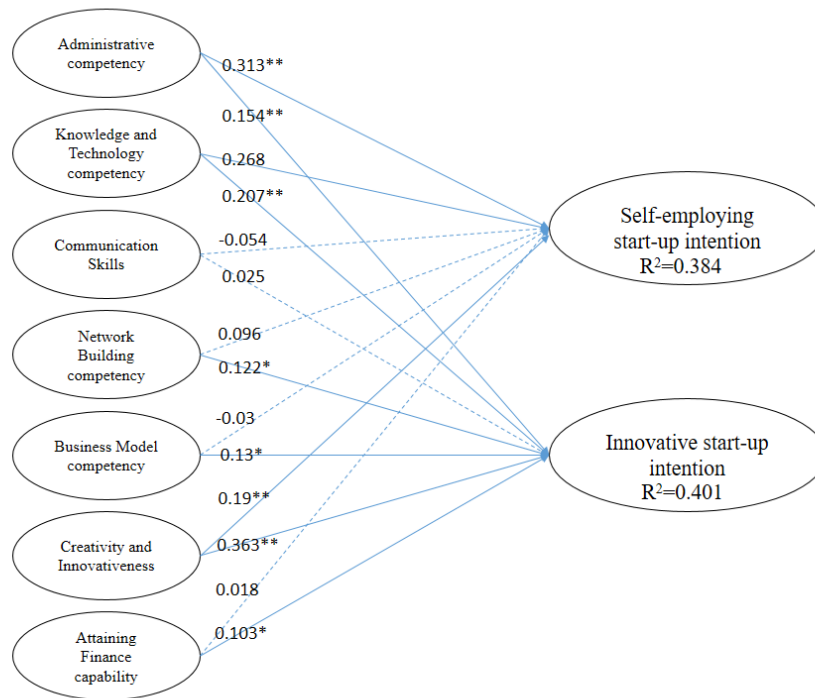
\*R square: 0.384

\*|t|>1.96 Significant at P<0.05, \*\*|t|>2.58 Significant at P<0.01

| <b>Table 4b</b>   |             |                |               |
|---|-------------|----------------|---------------|
| <b>HYPOTHESIS TEST: DEPENDENT FACTOR B</b>              |             |                |               |
| <b>Dependent factor: Innovative start-up intentions</b> | <b>Beta</b> | <b>t-value</b> | <b>Result</b> |
| H1b<br>Administrative competency                        | 0.154       | **2.702        | Supported     |
| H2b<br>Knowledge and technology competency              | 0.207       | **4.754        | Supported     |
| H3b<br>Communication skills                             | 0.025       | 0.457          | Not Supported |
| H4b<br>Network Building competency                      | 0.122       | *2.117         | Supported     |
| H5b<br>Business model development competency            | 0.13        | *2.173         | Supported     |
| H6b<br>Creativity and innovativeness competency         | 0.363       | **9.487        | Supported     |
| H7b<br>Attaining finance capability                     | 0.103       | *2.502         | Supported     |

\*R square: 0.401

\*|t|>1.96 Significant at P<0.05, \*\*|t|>2.58 Significant at P<0.01



Note: \*p < 0.05; \*\*p < 0.01. To simplify the graph, the indicators for each construct are not shown.

**FIGURE 2  
RESULT OF ANALYSIS**

**CONCLUSION**

The aim of this study is to investigate the relationship between entrepreneurs’ managerial competencies and start-up intentions among university students in respect to self-employed and innovative start-ups. The result of this study indicates that self-employed and innovative start-up intentions are significantly influenced by entrepreneurs’ managerial competencies such as administrative competency, knowledge and technology, creativity and innovativeness, network building, business model development and gaining finance. In particular, for self-employed start-up intentions, administrative competency, knowledge and technology, creativity and innovativeness are respectively the most effective factors. Conversely, the effect of network building, business model development, gaining finance and communication skills were not proven significantly important. However, for an innovative start-up intentions, all competencies except communication skills were significant. Therefore, university students’ start-up intentions for innovative businesses are influenced by more diverse factors representing entrepreneurial competencies compared to self-employed start-up intentions. In particular, the most affecting

factors in innovative start-up intentions are creativity and innovativeness and knowledge and technology. Therefore, university education to promote students' entrepreneurship need to basically focus on growing administrative capabilities, required knowledge and technologies, and creativity and innovativeness that are significant for self-employing and innovative start-up intentions. In addition, to grow up students' innovative start-up intentions which is being targeted in many universities, diverse managerial competencies need to be grown up including network building competency, business model development competency, and gaining finance capability.

The result of this study provide valuable implications for university educators and policy makers to improve the entrepreneurship education system. Again, many managerial competencies are closely related to developing start-up intentions among university students and therefore the university education need to do critical roles in promoting start-up intentions through the introduction of appropriate programs to grow students' managerial competencies in terms of adequate knowledge, capabilities and skills. The findings of this study can be meaningful to the academics in that this study introduced a new area of managerial competencies in the study on factors affecting start-up intentions. In addition, the results of this study is helpful for practitioners such as university educators and policy makers in that the results can provide useful ideas and insights to improve their university education system to promote students' entrepreneurship. Especially, innovative start-up require diverse managerial capabilities than in self-employing start-up. So, diverse approaches to grow required competencies need to be attempted including curricular courses and extra activities.

This study has also some limitations and provides with future research challenges. First, further factors in terms of university students' entrepreneurial competencies need to explored and tested in the relationship with start-up intentions. University students represent a special entrepreneurs group in their age, education, knowledge and so further factors reflecting their unique characteristics need to be extracted and reflected to the affecting factors. Second, diverse cases of effective education system design for the development of university students' managerial competencies need to be explored and studied in further studies. In particular, the relationship between specific education programs and diverse entrepreneurs' managerial competencies need to be studied. Third, this study tested the hypotheses only based on the analyses of the data collected from Iranian university students. Therefore, further studies from other diverse countries reflecting different culture and diverse student characteristics could make the theoretical bases found in this study more robust.

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