

## A competency-based model for the success of an entrepreneurial start-up

WEI-WEN WU

Department of International Trade,  
Ta Hwa Institute of Technology,

1. Ta Hwa Road, Chung-Lin, Hsin-Chu 30704

TAIWAN

itmike@thit.edu.tw

*Abstract:* - Many people envy entrepreneurs and want to emulate them as a road to wealth, fame, and freedom. A large number of works have argued about what makes a person act entrepreneurially, and various traits and characteristics of entrepreneurs have been enthusiastically discussed. This study focuses on one particular point: how to facilitate a person's efforts to become a small firm entrepreneur through competency assessment and development. To this end, this study proposes an entrepreneur competency model and employs the rough set theory (RST) and the best attribute-value (BAV) to investigate whether there are diverse competencies between small firm entrepreneurs and large firm managers. The results of this study indicate that the small firm entrepreneur generally excels in "building a mechanism for talent development", while a large firm manager is good at "knowing the different urgency of elements of a problem" or "making feasible solutions for actions". Thus, if a large firm manager wants to emulate a small firm entrepreneur, the suggestion is to de-emphasize methodical thinking and paper work, and to undertake more human networking.

*Keywords:* - entrepreneur; competency model; rough set theory; best attribute-value

### 1. Introduction

Successful entrepreneurs are important to the development of society because they contribute to the creation of employment opportunities, and to the advance of economic growth. Entrepreneurs are often regarded as marvelous people who are capable of devising new ideas, evaluating opportunities and risks, or starting and running a business. Numerous works in the literature have paid considerable attention to the particular features or traits that make a person act entrepreneurially, and a long list of crucial traits and characteristics has been discussed. For example, [30] conduct a comparison of determinants for business start-up in the U.S. and Korea. [32] show forty-two characteristics descriptive of the entrepreneur. Especially, [25] highlight several entrepreneurial traits associated with successful entrepreneurs, as follows: high need for achievement [35][21][37][3], high need for independence [8][4][24], locus of control [5][41], moderate risk-taking [14][40][37][24], tolerance for ambiguity [55][37], and innovation [56][15][37]. Additionally, [39] examine the relation between entrepreneurial orientation and growth orientation. [64] emphasize that corporate entrepreneurship

performs a unique role of resource capital configuration. [53] argue that nascent entrepreneurs are pushed toward entrepreneurial career due to low job satisfaction in their pre-entrepreneurial employment. [13] perform studies regarding a past, present, and future perspective on data analysis techniques and competencies in entrepreneurship.

As to the definition of an entrepreneur, there are several valuable suggestions in the literature, such as the following: an entrepreneur is a person who creates a new business as a founder [19]; the entrepreneur is the person who discovers a business idea for a venture [28], and enables the idea to become a new business [63]; and, on the negative side, anyone who inherits or buys an existing enterprise or manages a turnaround as an employee is not an entrepreneur [10]. This study adopts the notion that an entrepreneur is a person who creates a new business as a founder and possesses a certain ownership, and does not act merely as an employed manager [19][10]. Furthermore, [10] note that various schools of thought provide different but useful insights, and describe six schools of thought about entrepreneurship activity, including: (1) the "Great Person" school which deems that

entrepreneurs are endowed with certain traits differentiating them from others; (2) the “Psychological Characteristics” school accentuates personality factors (distinctive values and attitudes) that make entrepreneurs unique; (3) the “Classical” school focuses on innovation and creativity for entrepreneurs; (4) the “Management” school stresses the business capability of an entrepreneur; (5) the “Leadership” school emphasizes the effectiveness of leadership style for an entrepreneur; and (6) the “Intrapreneurship” school encourages entrepreneurship in a teamwork context.

Entrepreneurship has developed from a subdiscipline of management studies reliant on alien terms and cognitive methods toward a separate field [9]. Recently, several studies have argued that previous writers on entrepreneurship tended to exaggerate and romanticize the individual characteristics of entrepreneurs when new firms are successful, and that, in fact, entrepreneurs are social creatures, not solo heroes. Moreover, these studies argue, entrepreneurship is embedded in a social context, is considered as a social process [18], implies an ability to recognize, exploit, and take risks in seizing entrepreneurial opportunities [63], and is a social activity, involving personal contacts in a social network. Based on social system theory, [20] suggest that entrepreneurs use four types of functions (goal attainment, pattern maintenance, social networking and economic optimization) to develop their business. [7] discuss the role of networks in generating interpersonal and inter-organizational trust. [2] argue key similarities and differences between commercial and social entrepreneurship. [12] emphasize that entrepreneurial behavior is a result of the interplay of social networks and certain cognitive biases in entrepreneurs. Such works based on the social view emphasize that entrepreneurs act largely as social creatures in order to successfully collect necessary resources and create favorable performance through complex personal interactions using interpersonal influence skills both on the outside and inside of an organization.

Outstanding small firm entrepreneurs and large firm managers are acting in dissimilar roles, but all they make certain contributions to our society and economic development. Both small firm entrepreneurs and large firm managers are the same in that they must face the reality that every sunrise represents a new challenge to their ability to seek opportunities for marketing new products to consumers and to achieve excellent financial performance. Entrepreneurs often enjoy a very positive judgment in public estimation: they are

viewed as people who provide money for the people who work as their employees. We may consider that an employee contributes labor to feed his family, while an entrepreneur contributes entrepreneurship to feed his employees. Managers are seen more neutrally: compared with entrepreneurs, managers are generally supposed to be more methodical but less inclined to risk-taking. Some studies in the literature have examined the differences in features between entrepreneurs and managers. [6] investigate differences between entrepreneurs and managers in large organizations, and report that entrepreneurs are more susceptible to decision-making biases and heuristics than are managers. [60], in their study, report that entrepreneurs are higher in achievement motivation, risk-taking propensity, and preference for innovation than are both corporate managers and small business owners. [62] examines characteristic differences between managers of large state-owned enterprises and entrepreneurs of small privately-owned enterprises; the results of this study indicate that managers are not as innovative and are less willing to make risky decisions than entrepreneurs. Moreover, [61] indicate that entrepreneurs exhibit higher achievement motivations than managers and that these differences are influenced by the entrepreneur's venture goals.

Because entrepreneurship has emerged as the most potent economic force, growth and development in the curricula and programs devoted to entrepreneurship and new-venture creation have been remarkable [27]. Entrepreneurship education is constantly seen as an effective way of providing small-medium size enterprises with the management expertise they require in order to develop and grow [25], and has had an impact on student propensity and intentionality [50][49]. Many countries therefore endeavor to foster the entrepreneurial mindset and relevant skills for their people to succeed in a complex world. Entrepreneurship education at school is to develop entrepreneurial capacities and mindsets [17]. However, the conventional approach of entrepreneurship education is apt to overemphasize the importance on management expertise. In addition to the management expertise, entrepreneur competency approach is also helpful and essential to nurture the entrepreneurial mindset and skills. Nowadays, competency-based applications are utilized in all major human resource fields, including recruitment, selection, assessment, development, appraisal, and rewards [54][57]. According to [31], the competency approach has become an increasingly popular means of studying entrepreneurial

characteristics. The main advantage, they contend, of using this approach is that it is particularly well suited to the kind of investigation of entrepreneurship which emphasizes long-lasting individual characteristics leading to success, rather than simply skills and abilities. In other words, widely divergent schools of thought about essential entrepreneurship activities or features can be integrated into an entrepreneur competency model. Hence, using the competency approach for the discovery of the divergence of competencies between small firm entrepreneurs and large firm managers can be helpful to a large firm manager who wishes to imitate, and finally emulate, a small firm entrepreneur through competency development based on such diverse competencies. In this spirit, this study thus proposes an entrepreneur competency model to investigate these differences using the rough set theory (RST) and the best attribute-value (BAV).

The remainder of this paper is organized as follows. In the next section, the competency and the entrepreneur competency model are described. In the subsequent section, the research design and results are presented. Finally, based upon the findings, conclusions and suggestions are given.

## 2. Competency and entrepreneur competency model

### 2.1 Competency

McClelland's paper, "Testing for Competence Rather Than Intelligence" [36], is credited with starting the competency movement in 1970s. Basically, competencies are the characteristics of people that differentiate performance in a specific job or role. Furthermore, competencies encompass clusters of skills, knowledge, abilities, and behaviors required for people to succeed [11]. According to [16], each competency usually has from one to five behavioral indicators associated with it; a behavioral indicator describes a behavior that one would expect to observe when a competency is being used in an appropriate manner during work completion. Although the definition of a competency has not reached unanimity over the years [58][43], competencies are now commonly conceptualized as measurable patterns of knowledge, skills, abilities, behaviors, and other characteristics (KSAOs) that differentiate high from average or poor performance [42][1][51].

Using competencies as the basis for human resource systems has become a worldwide trend.

But, in fact, if they are to be used effectively, it is necessary to build the competency models up front, when competencies are applied in practice. A competency model is a set of competencies, often organized into some clusters for a specific purpose. According to [33], the competency model is a detailed description of behaviors which employees require in order to have the ability to be effective in a job. Fundamentally, we may regard the competency model as a set of success factors which contribute to achieving high performance and concrete results. The competency model is important because it provides a road map for the range of behaviors that produce excellent performance [29].

### 2.2 Entrepreneur competency model

According to [31], entrepreneurial competencies are a set of higher-level characteristics involving personality traits, skills and knowledge. They can be viewed as the total ability of the entrepreneur to perform his role successfully. [23] emphasizes 12 competency areas that are required for small business success, including: starting a business, planning and budgeting, management, marketing/selling, advertising and sale promotion, merchandising, financing and accounting, personnel relations, purchasing, production, facilities and equipment, and controlling risk. Moreover, [26] notes that entrepreneurial competency is the sum total of the entrepreneur's requisite attributes for successful and sustainable entrepreneurship, including attitudes, values, beliefs, knowledge, skills, abilities, personality, wisdom, expertise (social, technical, managerial), mindset and behavioral tendencies. Furthermore, [52] explore the relationships among managerial competencies, entrepreneurial style, and firm type. Additionally, intelligence can be viewed as a specific competency. [59] stresses the most important intelligence for an entrepreneur to be successful is that which involves a balance of analytical, creative, and practical abilities.

[44] presents a three-layered concept of entrepreneurship competencies, and notes that proper entrepreneurial competencies are helpful when undertaking to start an enterprise and to help it survive or grow; furthermore, entrepreneurial competency is the integrated ability to perform entrepreneurial activities effectively. These comprise mainly: the ability to recognize and analyze market opportunities; the ability to communicate, identify mentally, persuade and discuss with all stakeholders in the business environment; and the ability to establish networks

linking with business persons and stakeholders for mutual learning and collaborative undertaking.

There are many kinds of manager competency models which have been developed in the world at large, but entrepreneurial competency models are relatively rare. Fortunately, some valuable entrepreneurial competency models can be easily accessed for study, such as: the Generic Entrepreneur Competency Model developed by [34] for the purpose of identifying potential successful entrepreneurs; and the NRC Entrepreneurship Model offered by the National Research Council of Canada (NRC) for the purpose of supporting employees in making a successful transition to entrepreneurship in a technology or science-based business venture. The Generic Entrepreneur Competency Model is completely described in the book *Competence at Work: Models for Superior Performance* [58], while the NRC Entrepreneurship Model is fully displayed on the website of the NRC.

The Generic Entrepreneur Competency Model includes seven clusters (achievement, thinking and problem solving, personal maturity, influence, directing and controlling, orientation to others, and additional competencies), and each cluster comprises a number of separate competencies; in total there are 22 competencies in this model. As for the NRC Entrepreneurship Model, it is basically divided into three clusters (achievement/results orientation, interpersonal and team-building, and business focus), in which every cluster involves some varied competencies according to different levels.

### 3. Research design and results

This study aims to develop an entrepreneur competency model to investigate whether there are

differences between small firm entrepreneurs and large firm managers. The data collection and instrument, analysis methods, data analysis, and discussions are described below.

#### 3.1 Data collection and instrument

After reviewing related literature, the author composed for this study an entrepreneur competency list which largely derives from the Generic Entrepreneur Competency Model [34] and the NRC Entrepreneurship Model. Subsequently, the preliminary model of 42 entrepreneur competencies was modified through the expert interview method. Six face-to-face interviews with experts were conducted to discuss the concept of entrepreneur competency and the suitability or sufficiency of the preliminary model. These experts included three manufacturing entrepreneurs (from a small firm, a medium-sized firm, and a large firm), one owner of a consulting firm, one college scholar who is familiar with competency theory, and another one who is the chairman of the Hsin-Chu Human Resource Management Association. This study takes these experts' opinions into account and then achieves a refined model.

The refined model comprises 23 competencies (see Table 1), including: Analytical Thinking, Business Acumen, Client Service Orientation, Commitment to Learning, Communication, Conceptual Thinking, Order and Quality, Developing Others, Empathy, Expertise, Flexibility, Influence, Information Seeking, Initiative, Innovation, Organizational Awareness, Personal Motivation, Relationship Building, Results Orientation, Self-Confidence, Self-Control, Team Leadership, Verbal and Written Communication.

Table 1 The 23 entrepreneur competencies

- |   |
|---|
| <ol style="list-style-type: none"> <li>1. Analytical Thinking: the ability to analyze problems systematically.</li> <li>2. Business Acumen: the ability to discover opportunities and transform resources into performance.</li> <li>3. Client Service Orientation: the ability to meet the needs of both internal and external customers.</li> <li>4. Commitment to Learning: the ability to actively pursue learning and develop competitiveness.</li> <li>5. Communication: the ability to effectively receive and express information or feelings.</li> <li>6. Conceptual Thinking: the ability to recognize patterns or trends in a problem.</li> <li>7. Order and Quality: the ability to reduce uncertainty and to control quality.</li> <li>8. Developing Others: the ability to help others make progress.</li> <li>9. Empathy: the ability to understand and respond to the concerns of others.</li> <li>10. Expertise: the ability to perform professional jobs.</li> <li>11. Flexibility: the ability to effectively adapt to a variety of situations.</li> <li>12. Influence: the ability to influence thoughts and actions of others.</li> <li>13. Information Seeking: the ability to capture enough information to increase knowledge or find solutions.</li> </ol> |
|---|

14. Initiative: the ability to be a self-starter and to meet the challenge of higher level objectives.
15. Innovation: the ability to make something new and to improve performance.
16. Organizational Awareness: the ability to recognize the power relationships in organizations.
17. Personal Motivation: the will to succeed and offer service.
18. Relationship Building: the ability to build and maintain personal networks.
19. Results Orientation: the ability to set performance objectives and measures.
20. Self-Confidence: the ability to express oneself in a hostile situation.
21. Self-Control: the ability to manage one's emotions under pressure or temptation.
22. Team Leadership: the ability to create a favorable environment and mobilize people to succeed.
23. Verbal and Written Communication: the ability to speak and write satisfactorily.

Furthermore, each competency has five behavioral indicators corresponding to different required levels. For example, the "Analytical Thinking" competency includes five behavioral indicators: Level 1: Sees Causal Relationships of problems; Level 2: Weighs the value of each element of a problem; Level 3: Knows the different urgency of elements of a problem; Level 4: Realizes the process or procedure of implementing solutions to problems; and Level 5: Makes feasible solutions for actions. In this study, "Level 5" is viewed as the best, that is, "Level 5" surpasses "Level 4". For the purpose of testing the refined model, this study carried out personal interviews with two entrepreneurs of small firms and five managers of large firms, who were recommended by the Hsin-Chu Human Resource Management Association.

Entrepreneur A1 broke away from his family business enterprise, and independently established an apparel manufacturing firm in 1992. The philosophy of this firm was that it must be proactive rather than reactive in order to preserve its position in the industry. Under a business policy based on the niche and value-added strategy, the focus of this firm was designing, doing research and development, and manufacturing apparel parts for the Japanese and European markets. This firm, with an annual turnover of over NT\$ 15 million, and employing eight staff, always achieved a high level of profit margin. Entrepreneur A2 had experience as a manager in two large firms, and started up his business in 2004. Presently, he runs a Chinese food restaurant with three franchise branches, an annual turnover of over NT\$ 8 million, and six staff members employed. Because of increasing competition as well as high costs and low turnover rate, the focus of this firm has been, provisionally, only in the local market. Under the pressure of limited resources and inflation, this firm has been struggling to control quality and costs while, at the same time, developing new products and services.

Manager B1 worked in the Unisys Taiwan

company, and won that company's best manager prize. At present, he works in a firm which, with more than NT\$ 2,700 million turnover and over 1,890 employees worldwide, is one of the world's leading manufacturers in the broadband wireless networking business, offering various products and packages covering a wide range, including wireless ADSL, access point, wireless router, client adapter, and build-in module. Manager B2 has worked in HP Taiwan and UMC Taiwan. She is now working in a firm with more than 2,150 employees in 18 countries with a turnover in excess of NT\$ 4,670 million. As a top solution provider in the industrial automation market, it offers more than 420 products and solutions ranging from system-integration hardware and software to customer-driven service. Manager B3 is working in a firm with more than NT\$ 2,200 million turnover and over 1,550 employees, engaged in the design, manufacture, and sale of electronic-grade wafers for the semiconductor industry. It is outstanding as a leading manufacturer of wafers, and operates a state-of-the-art silicon wafer manufacturing facility. The manager B4 has worked in Iwasaki Japan, and he is now working in a firm with more than NT\$4,520 million turnover and over 3,240 employees, focused on developing and marketing high brightness Light Emitting Diode (LED) products. Manager B5 formerly was in a trading firm, and she is currently working in a firm with more than NT\$ 6,220 million turnover and over 4,800 employees. It is the world's primary provider of switching power supplies and brushless fans, as well as a major source for power management solutions, components, visual displays, industrial automation, and so on.

Prior to conducting the personal interview, the author sent all participants the necessary materials related to the concept of competency and the contents of the entrepreneur competency model. When the interviews with them were conducted, they were asked to designate the most important behavioral indicator for each competency within the

questionnaire based on the proposed entrepreneur competency model.

### 3.2 Analysis methods

For the data analysis, the RST and the BAV are used here. Well known as a data mining technique, the RST is a relatively new approach and very effective at data reduction in qualitative analysis. The RST was firstly introduced by [45], as a valuable mathematical tool for dealing with vagueness and uncertainty [46][47][48]. Unlike a conventional data analysis which uses a statistical inferential technique, the RST is based on special data-mining techniques. An analysis based on the RST has several unique abilities. Among these are: finding the reducts of attributes, digging out the core of attributes, and creating decision rules.

This study utilizes the so-called Covering Index (CI). This index presents a covering ratio, i.e., the ratio of A: how many objects with the same attribute value there are in a class, to B: how many objects belong to that same class [22]. For more details

regarding the CI, please refer to an explanation and illustration presented by [22]. For the purpose of using the RST to deal with the qualitative analysis undertaken here, the contents of the entrepreneur competency model were transformed into the RST-based form as shown in the Appendix. Note that 23 competencies are denoted as alphabetic symbols from A to W; further, let “a” = Level 1, “b” = Level 2, “c” = Level 3, “d” = Level 4, and “e” = Level 5 for behavioral indicators. The “X” symbol stands for whether or not status as an entrepreneur is achieved: the answer is either 0 = No or 1 = Yes.

Each competency is viewed as an independent attribute, and each includes five behavioral indicators from “a” to “e”. Such a behavioral indicator is regarded as an attribute-value of an independent attribute. Thus, the “e” is the BAV. Moreover, the “X” is called the dependent (class) attribute, and has two attribute-values (0 = No, 1 = Yes) in this study. The original dataset can be presented in tabular form as shown in Table 2 where each cell has an attribute-value pair.

Table 2 Dataset with attribute-value pairs

Object	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
O1	Ab	Ba	Ce	De	Ec	Fb	Gb	He	Ic	Jb	Kc	Lc	Me	Nb	Ob	Pb	Qb	Rb	Sb	Te	Ub	Va	Wc	1
O2	Ab	Ba	Ce	De	Ee	Fe	Ge	He	Ic	Je	Ke	Lc	Me	Nc	Oe	Pe	Qb	Ra	Se	Te	Ue	Vd	Wb	1
O3	Ae	Bb	Ce	Dc	Ea	Fa	Gb	Ha	Ib	Jc	Ke	Lb	Mb	Nc	Ob	Pb	Qb	Rd	Sc	Tc	Ub	Va	Wa	0
O4	Ae	Ba	Ca	Da	Eb	Fd	Gd	Hc	Id	Jd	Kc	Le	Me	Nb	Oe	Pe	Qe	Ra	Se	Td	Uc	Ve	We	0
O5	Ae	Bd	Cd	De	Ee	Fe	Ge	Hd	Id	Jc	Kc	Lc	Md	Nc	Ob	Pe	Qb	Rd	Sb	Te	Ud	Ve	Wb	0
O6	Ae	Be	Ce	De	Ed	Fe	Gc	Hd	Id	Jc	Ke	Lc	Me	Ne	Od	Pe	Qa	Ra	Se	Td	Ud	Va	Wb	0
O7	Ac	Ba	Ce	De	Ec	Fb	Gc	Hd	Id	Jb	Kc	Lc	Mb	Nc	Od	Pc	Qb	Rd	Sb	Tc	Ue	Vb	Wb	0

### 3.3 Data analysis

Tasks of data analysis such as this can be implemented with the help of the software ROSE (Rough Sets Data Explorer). The ROSE is software that implements basic elements of the rough set theory and rule discovery techniques. From the data analysis using the RST we can obtain two rules as follows. Rule 1 is that the attribute-value “b” (Weights the value of each elements of a problem) of competency A (Analytical Thinking) can identify the “Entrepreneur” with the CI value of 100.00%. Rule 2 is that the attribute-value “c” (Knows the different urgency of elements of a problem) or “e” (Makes feasible solutions for actions) of competency A is a reliable indicator of the category “Non-Entrepreneur” with the CI value of 100.00%.

Rule 1: {Ab} =>Entrepreneur = Yes; CI = 100.00%.

Rule 2: {Ae, Ac} => Entrepreneur = No; CI = 100.00%.

The result of analysis using the BAV displays a surprising outcome. As shown in Table 3, in which the “☆” denotes BAV while the “▽” signifies non-BAV, the attribute-value “e” (Builds a mechanism for talent development) of competency H (Developing Others) can be said to definitively distinguish the “Entrepreneur” from the “non-Entrepreneur”.

Table 3 Analysis result using the BAV

Object	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
O1	▽	▽	☆	☆	▽	▽	▽	☆	▽	▽	▽	▽	☆	▽	▽	▽	▽	▽	☆	▽	▽	▽	▽	1
O2	▽	▽	☆	☆	☆	☆	☆	☆	▽	☆	☆	▽	☆	▽	☆	☆	▽	▽	☆	☆	☆	▽	▽	1
O3	☆	▽	☆	▽	▽	▽	▽	▽	▽	▽	☆	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	0
O4	☆	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	☆	☆	▽	☆	☆	☆	▽	☆	▽	▽	☆	☆	0
O5	☆	▽	▽	☆	☆	☆	☆	▽	▽	▽	▽	▽	▽	▽	☆	▽	▽	▽	☆	▽	▽	☆	▽	0
O6	☆	☆	☆	☆	▽	☆	▽	▽	▽	▽	☆	▽	☆	☆	▽	☆	▽	▽	☆	▽	▽	▽	▽	0
O7	▽	▽	☆	☆	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	☆	▽	▽	0

### 3.4 Discussion

Although both large firm managers and small firm entrepreneurs are capable and make certain contributions to our society and economic development, many people envy small firm entrepreneurs and want to emulate them as a road to wealth, fame, and freedom. It is an interesting question of what factors lead to large firm managers and small firm entrepreneurs taking different paths. With reference to this question, [10] note that each of the various schools of thought offers special insights that help us to understand the nature of entrepreneurship activity or the variety of entrepreneurial features such as: personal value system, risk-taking propensity, need for achievement, creativity or innovativeness, management knowledge and skills, entrepreneurial leadership, and so on. However, each school of thought explains only a portion of the truth. Entrepreneurship activities or entrepreneurial features can be grouped into a number of categories, among them the following: knowledge and skills, attitudes, values, traits, and personal characteristics. These categories can then be integrated into an entrepreneur competency model. This is because the competency model includes measurable elements, including patterns of knowledge, skills, attitudes, behaviors, and other characteristics. With this in mind, this study adopts the competency approach and builds an entrepreneur competency model for exploring the difference between small firm entrepreneurs and large firm managers.

In fact, the application of competency measures is able to differentiate high performers from average performers. Additionally, it turns out the entrepreneur competency model can differentiate small firm entrepreneurs from large firm managers. In this empirical study, the results of analysis using the RST reveal that the “Entrepreneur” can be fully identified by the attribute-value “b” (Weighs the value of each elements of a problem) of competency A while the “Non-Entrepreneur” can be fully identified by the attribute-value “c” (Knows the

different urgency of elements of a problem) or “e” (Makes feasible solutions for actions) of competency A. This is a most meaningful finding, showing that (1) with the use of RST, we can utilize only few attribute-values to effectively recognize the “Entrepreneur” or the “Non-Entrepreneur”, rather than the entirety of 115 attribute-values; (2) both Rule 1 and Rule 2 are involving the competency A (Analytical Thinking) which may regarded as the key competency to distinguish whether a given individual is an “Entrepreneur” or not. More importantly, although we often consider that entrepreneurs are smarter than managers, the findings of this study indicate that this is actually not so. Attribute value “c” (Knows the different urgency of elements of a problem) or “e” (Makes feasible solutions for actions) for large firm managers is a higher level attribute than “b” (Weighs the value of each elements of a problem) for small firm entrepreneurs. The findings, incidentally accord with a cautionary note by [58]. They emphasize that a behavioral indicator at higher level does not mean that a behavior is necessarily better; rather, each role or job has an optimal point on each scale.

This study also employs the BAV for the purpose of further exploration. The results arrived at using the BAV show that the attribute-value “e” (Builds a mechanism for talent development) of the competency H (Developing Others) can infallibly distinguish whether a given subject is an “Entrepreneur” or not. The findings agree with the notion that entrepreneurs are social creatures and are more capable of utilizing the human resource than are managers. This may explain why a person with lower school marks tends to be a small firm entrepreneur while another, with higher school marks, will become a large firm manager. The determinant is, apparently, the predominance of social over analytical skills: the ability to construct devices or systems which foster talents both outside and inside the enterprise – a social skill which enables one to maximize one’s interpersonal

influence and power.

From the above, some conclusions can be derived. Firstly, we may conclude that the views of the various schools of thought about the nature of entrepreneurship activity or entrepreneurial features can be incorporated into an entrepreneur competency model. Next, through the use of a combination of the RST and the BAV we can uncover a deeper level of indicators for decision-making. The findings of this study also lead us to conclude that being a small firm entrepreneur demands the ability to build a talent pool, much more than the ability to think analytically. It also suggests that a small firm needs to be better at rapid and flexible response to the changeable business world than does a large firm, and that the success of a small firm is more dependent on human networks and social relations. Thus, if a large firm manager wants to become a small firm entrepreneur, it appears he needs to place less emphasis on methodical thinking and paper work, and more on human networking.

#### 4. Conclusions and suggestions

For the purpose of exploring the difference between small firm entrepreneurs and large firm managers, this study developed an entrepreneur competency model based on a review of the literature followed by systematically conducted interviews with selected experts. This study is presented as a test case for the extension of practical applications of the RST and the BAV in the field of entrepreneurship research, and it successfully achieved the aim of finding out certain differences between small firm entrepreneurs and large firm managers.

Several studies have investigated the difference between entrepreneurs and managers. [6] examine differences in the decision-making processes between entrepreneurs and managers in large organizations. [60] conduct a comparison of entrepreneurs, small business owners, and corporate managers with special attention to the differences in achievement motivation, risk-taking propensity, and preference for innovation. [62] investigates the different impact on innovation and risk-taking between managers of large state-owned enterprises and entrepreneurs of small privately-owned enterprises. [61] perform a meta-analysis of achievement motivation differences between entrepreneurs and managers. This study differs substantially from those mentioned above, not only with regard to the research approach, but also with regard to the research focus, objectives, and method

of analysis. The proposed competency model is a synthesis of the views of varied schools of thought about entrepreneurship activity or entrepreneurial features, and this study use it, with the RST and BAV methodologies, to explore the differences in the range of competencies between small firm entrepreneurs and large firm managers.

The findings of this study show that (1) using the RST, the behavioral indicator “Weighs the value of each elements of a problem” can be used to reliably identify a small firm entrepreneur, while the behavioral indicator “Knows the different urgency of elements of a problem” or “Makes feasible solutions for actions” can be used to identify a large firm manager; (2) using the BAV, the behavioral indicator “Builds a mechanism for talent development” can definitively distinguish a small firm entrepreneur from a large firm manager; (3) the competency “Analytical Thinking” from the RST and the competency “Developing Others” from the BAV, are the key competencies which may be used to determine whether a given individual is an “Entrepreneur” or not; and (4) by using either the RST or the BAV, we can effectively differentiate whether a given subject is an “Entrepreneur” or not, with reference to a very minimal number of attribute-values (behavioral indicators).

Although each school of thought about entrepreneurship activities or entrepreneurial features has its own emphasis and unique point of view, it is quite feasible, the author proposes, to integrate them into an entrepreneur competency model, with the possible goal of helping a person learn to be an entrepreneur through the aid of competency development. Using new methodologies, such as the RST or the BAV, we may blaze new trails in this endeavor. This study clearly shows that, among 23 competencies, only two of them – “Analytical Thinking” and “Developing Others” are the essential determinants when we wish to discriminate between a small firm entrepreneur and a large firm manager. With regard to the behavioral indicators, this study finds that the small firm entrepreneur is excellent in “Builds a mechanism for talent development” while a large firm manager is good at “Knows the different urgency of elements of a problem” or “Makes feasible solutions for actions”. This reveals that if a large firm manager wants to emulate a small firm entrepreneur, the suggestion is to de-emphasize methodical thinking and paper work, and to undertake more human networking. The finding is particularly valuable and important, because it provides useful directions in terms of entrepreneurship education and training for young



people, and offers insights that can help a large firm manager to become a small firm entrepreneur or to boost the probability of a start-up's success.

This pilot study reveals some meaningful facts, but it must be admitted that the sample size is small and is therefore of limited statistical significance. However, the proposed model could be further tested and extended. Additionally, based on the study results, some propositions can be presented as tentatively dependable such as: a large firm manager is superior to a small firm entrepreneur in analytical thinking; and a small firm entrepreneur is superior to a large firm manager in developing others. As for future research, possible directions are as follows: refining the proposed model through more case studies; improving the usefulness of the RST and the BAV; and developing an entrepreneur competency set that can effectively help a large firm manager to become a small firm entrepreneur, given that each role optimally requires its own competency set.

#### References

- [1] T.R. Athey, M.S. Orth, Emerging Competency Methods for the Future. *Human Resource Management*, Vol.38,3, 1999, pp.215-226.
- [2] J. Austin, H. Stevenson, J. Wei-Skillern, Social and Commercial Entrepreneurship: Same, Different, or Both? *Entrepreneurship Theory and Practice*, Vol.30, 2006, pp.11-22.
- [3] M.W. Begley, D.P. Boyd, Psychological Characteristics Associated with Performance in Entrepreneurial Firms and Small Businesses. *Journal of Business Venturing*, Vol.2, 1987, pp.79-93.
- [4] B. Bird, *Entrepreneurial Behavior*, Scott Foresman Glenview IL and London, 1989.
- [5] R.H.S. Brockhaus, *The psychology of the entrepreneur*. In: Kent, C.A., Sexton, D.L., Vesper, K.H. (Eds.), *Encyclopedias of Entrepreneurship*, Prentice-Hall, Englewood Cliffs, 1982.
- [6] L. Busenitz, J. Barney, Differences between entrepreneurs and managers in large organizations, *Journal of Business Venturing*, Vol.12,1, 1997, pp.403-426.
- [7] M. Casson, M.D. Giusta, Entrepreneurship and Social Capital: Analysing the Impact of Social Networks on Entrepreneurial Activity from a Rational Action Perspective. *International Small Business Journal*, Vol.25, 3, 2007, pp.220-244.
- [8] O. Collins, D. Moore, *The organization makers: A behavioral study of independent entrepreneurs*. New York: Meredith, 1970.
- [9] B. Cornelius, H. Landström, O. Persson, Entrepreneurial Studies: The Dynamic Research Front of a Developing Social Science. *Entrepreneurship Theory and Practice*, Vol.30, 3, 2006, pp.375-398.
- [10] J.B. Cunningham, J. Lischeron, Defining Entrepreneurship. *Journal of Small Business Management*, Vol.29, 1, 1991, pp.45-61.
- [11] P. Davis, J. Naughton, W. Rothwell, New roles and new competencies for the profession. *Training & Development*, Vol.58, 4, 2004, pp.26-37.
- [12] D.M. De Carolis, P. Saporito, Social Capital, Cognition, and Entrepreneurial Opportunities: A Theoretical Framework. *Entrepreneurship Theory and Practice*, Vol.30, 1, 2006, pp.41-56.
- [13] M.A. Dean, C.L. Shook, G.T. Payne, The Past, Present, and Future of Entrepreneurship Research: Data Analytic Trends and Training. *Entrepreneurship Theory and Practice*, Vol.31, 4, 2007, pp.601-618.
- [14] P.F. Drucker, Entrepreneurship in Business Enterprise, *Journal of Business Policy*, Vol.1, 1, 1970, pp.3-12.
- [15] P.F. Drucker, *Innovation and Entrepreneurship: Practice and Principles*. London: Heinemann, 1985.
- [16] D. Dubois, W. Rothwell, Competency-Based or a Traditional Approach to Training? *Training & Development*, Vol.58, 4, 2004, pp.46-58.
- [17] B.S. El-Khasawneh, *Entrepreneurship Promotion at Educational Institutions: A Model Suitable for Emerging Economies*. WSEAS TRANSACTIONS on BUSINESS and ECONOMICS, Vol5, 2, 2008, pp.27-35.
- [18] J. Freeman, *Venture capital as an economy of time*. Working paper. Haas Business School, University of California at Berkeley, 1996.
- [19] W.B. Gartner, A Conceptual Framework for Describing the Phenomena of New Venture Creation. *Academy of Management Review*, Vol.10, 4, 1985, pp.696-706.
- [20] A.J. Groen, I.A.M. Wakkee, P.C. De Weerd-Nederhof, Managing Tensions in a High-tech Start-up: An Innovation Journey in Social System Perspective. *International Small Business Journal*, Vol.26, 1, 2008, pp.57-81.
- [21] E.E. Hagen, *On the Theory of Social Change: How Economic Growth Begins*. Homewood, Ill.: Irwin Press, 1962.
- [22] Y.F. Huang, W.W. Wu, Y.T. Lee, Simplifying essential competencies for Taiwan civil

- [23] J.F. Huck, Competencies Needed for Small Business Success: Perceptions of Jamaican Entrepreneurs. *Journal of Small Business Management*, Vol.29, 4, 1991, pp.90-94.
- [24] A.B. Ibrahim, W. Ellis, *Entrepreneurship and Small Business Management*. Kendall-Hunt Publishing Company, Dubuque, IA, 1990.
- [25] A.B. Ibrahim, K. Soufani, Entrepreneurship education and training in Canada: a critical assessment. *Education and training*, Vol.44, 8/9, 2002, pp.421-430.
- [26] M. Kiggundy, Entrepreneurs and entrepreneurship in Africa: What is known and what needs to be done. *Journal of Developmental Entrepreneurship*, Vol.7, 3, 2002, pp.239-258.
- [27] D.F. Kuratko, The Emergence of Entrepreneurship Education: Development, Trends, and Challenges. *Entrepreneurship Theory and Practice*, Vol.29, 5, 2005, pp.577-598.
- [28] D. Kralj, D. Goricanec, L. Eisner, Environmental Management System Model for Entrepreneur Process. 2005 WSEAS Int. Conf. on ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT, Venice, Italy, November 2-4, 2005, pp.181-186.
- [29] Y.T. Lee, A Hybrid Approach for Exploring Training Needs and Methods for Human Resources Development Staffs. WSEAS TRANSACTIONS on BUSINESS and ECONOMICS. Vol.5, 5, 2008, pp.291-297.
- [30] S.S. Lee, J.S. Osteryoung, A Comparison of Determinants for Business Start-Up in the U.S. and Korea. *Journal of Small Business Management*, Vol.39, 2, 2001, pp.193-200.
- [31] T.W.Y. Man, T. Lau, K.F. Chan, The competitiveness of small and medium enterprises: A conceptualization with focus on entrepreneurial competencies. *Journal of Business Venturing*, Vol.17, 2, 2002, pp.123-142.
- [32] C.J. Mambula, F.E. Sawyer, Acts of entrepreneurial creativity for business growth and survival in a constrained economy: Case study of a small manufacturing firm. *International Journal of Social Economics*, Vol.31, 1, 2004, pp.30-55.
- [33] R.S. Mansfield, Building Competency Models: Approaches for HR Professionals. *Human Resource Management*, Vol.35, 1, 1996, pp.7-18.
- [34] R.S. Mansfield, D.C. McClelland, L.M. Spencer, J. Santiago, The Identification and Assessment of Competencies and Other Personal Characteristics of Entrepreneurs in Developing Countries: Final Report Project No. DAN-5314-C-00-3074-00, 1987.
- [35] D.C. McClelland, *The Achieving Society*, Van Nostrand, New York, NY, 1961.
- [36] D.C. McClelland, Testing for competence rather than for intelligence. *American Psychologist*, Vol.28, 1, 1973, pp.1-24.
- [37] D.C. McClelland, *The Achieving Society*, Free Press, New York, NY, 1985.
- [38] D.C. McClelland, Characteristics of successful entrepreneur, *The Journal of Creative Behavior*, Vol.21, 3, 1987, pp.219-233.
- [39] A.M. Moreno, J.C. Casillas, Entrepreneurial Orientation and Growth of SMEs: A Causal Model. *Entrepreneurship Theory and Practice*, Vol.32, 3, 2008, pp.507-528.
- [40] J.S. Mill, *Principles of Political Economy with Some Applications to Social Philosophy*, London: John W. Parker, 1984.
- [41] H. Mintzberg, J. Waters, Tracking strategies in and entrepreneurial firm. *Academy of Management Journal*, Vol.25, 3, 1982, pp.465-499.
- [42] R. Mirable, Everything You Wanted to Know About Competency Modeling. *Training and Development*, Vol.51, 8, 1997, pp.73-77.
- [43] O. Nordhaug, *Human Capital in Organizations: Competence, Training, and Learning*. Norway: Scandinavian University Press, 1993.
- [44] J. Onstenk, Entrepreneurship and Vocational Education. *European Educational Research Journal*, Vol.2, 1, 2003, pp.74-89.
- [45] Z. Pawlak, Rough sets. *International Journal of Computer and Information Science*, 11(5), 341-356, 1982.
- [46] Z. Pawlak, Rough Classification. *International Journal of Man-Machine Studies*, 20(5), 469-483, 1984.
- [47] Z. Pawlak, Rough Sets. In: Lin, T. Y. & Cercone, N. (Eds.). *Rough Sets and Data Mining: Analysis for Imprecise Data*. Norwell, MA: Kluwer Academic Publishers, 1997.
- [48] Z. Pawlak, Rough sets, decision algorithms and Bayes' theorem. *European Journal of Operational Research*, Vol.136, 1, 2002, pp.181-189.
- [49] N.E. Peterman, J. Kennedy, Enterprise Education: Influencing Students' Perceptions of Entrepreneurship. *Entrepreneurship Theory and Practice*, Vol.28, 2, 2003, pp.129-144.
- [50] L. Pittaway, J. Cope, Entrepreneurship

- [51] D. Rodriguez, R. Patel, A. Bright, Gregory D., & Gowing M.K. Developing Competency Models to Promote Integrated Human Resource. *Human Resource Management*, Vol.41, 3, 2002, pp.309-324.
- [52] E. Sadler-Smith, Y. Hampson, I. Chaston, B. Badger, Managerial Behavior, Entrepreneurial Style, and Small Firm Performance. *Journal of Small Business Management*, Vol.41, 1, 2003, pp.47-67.
- [53] L. Schjoedt, K.G. Shaver, Deciding on an Entrepreneurial Career: A Test of the Pull and Push Hypotheses Using the Panel Study of Entrepreneurial Dynamics Data. *Entrepreneurship Theory and Practice*, Vol.31, 5, 2007, pp.733-752.
- [54] S.C. Schoonover, H. Schoonover, D. Nemerov, C. Ehly, (2000). *Competency-Based HR Applications: Results of a Comprehensive Survey*, Arthur Andersen/Schoonover/SHRM.
- [55] J. Schreier, Tolerance of ambiguity as discriminating variable between entrepreneurs and managers, *Academy of Management Best Paper Proceedings*, Vol.42, 1982, pp.404-408.
- [56] J. Schumpeter, *The Theory of Economic Development*, Cambridge University Press, Cambridge, 1934.
- [57] G.C. Sinnott, G.H. Madison, G.E. Pataki, *Competencies: Report of the Competencies Workgroup, Workforce and Succession Planning Work Groups*. New York State Governor's Office of Employee Relations and the Department of Civil Service, 2002.
- [58] L.M. Spencer, S.M. Spencer, *Competence at work: Model for superior performance*. New York: John Wiley & Sons, Inc, 1993.
- [59] R.J. Sternberg, Successful intelligence as a basis for entrepreneurship. *Journal of Business Venturing*, Vol.19, 2 2004, pp.189-201.
- [60] W.H. Stewart Jr., W.E. Watson, J.C. Carland, J.W. Carland, A proclivity for entrepreneurship: A comparison of entrepreneurs, small business owners, and corporate managers. *Journal of Business Venturing*, Vol.14, 2, 1998, pp.189-214.
- [61] W.H. Stewart Jr., P.L. Roth, A Meta-Analysis of Achievement Motivation Differences between Entrepreneurs and Managers. *Journal of Small Business Management*, Vol.45, 4, 2007, pp.401-421.
- [62] J. Tan, Innovation and risk-taking in a transitional economy: A comparative study of Chinese managers and entrepreneurs. *Journal of Business Venturing*, Vol.16, 4, 2001, pp.359-376.
- [63] J.P. Ulhoi, The social dimensions of entrepreneurship. *Technovation*, Vol.25, 8, 2005, pp.939-946.
- [64] D.W. Yiu, C.M. Lau, Corporate Entrepreneurship as Resource Capital Configuration in Emerging Market Firms. *Entrepreneurship Theory and Practice*, Vol.32, 1, 2008, pp.37-57.

## Appendix. Attributes and attribute values

- A. Analytical Thinking:
- Sees Causal Relationships of problems
  - Weights the value of each element of a problem
  - Knows the different urgency of elements of a problem
  - Realizes the process or procedure of implementing problems
  - Makes feasible solutions for actions
- B. Business Acumen:
- Discovers business opportunities with initiative
  - Takes actions to practice business opportunities
  - Handles business analysis and management
  - Designs organization structures and systems
  - Innovates and implements business strategies
- C. Client Service Orientation:
- Understands the needs of external customers
  - Understands the needs of internal customers
  - Responds to the needs of external customers
  - Responds to the needs of internal customers
  - Gives satisfaction to both internal and external customers
- D. Commitment to Learning:
- Pursues learning about business success by oneself
  - Pursues learning about business success from others
  - Pursues learning in single special field
  - Pursues learning in two special fields
  - Pursues learning in multiple special fields
- E. Communication:
- Expresses information or feelings properly
  - Recognizes intentions behind information or feelings of counterparties
  - Employs communication skills or strategies smoothly
  - Achieves two-way communications effectively
  - Achieves the purpose of communications
- F. Conceptual Thinking:
- Realizes the connections between elements of a problem
  - Understands the key elements of a problem
  - Sees patterns or trends in a problem
  - Models the connections between elements of a problem
  - Utilizes conceptual models to make performance better
- G. Order and Quality:
- Shows concern for order in the surrounding environment
  - Shows concern for clarity of roles
  - Checks process and accuracy of own work
  - Checks process and accuracy of others' work
  - Monitors own and others' work progress
- M. Information Seeking:
- Queries information initiatively
  - Seeks information enthusiastically
  - Investigates problems systematically
  - Discovers solutions to a problem
  - Continues research constantly
- N. Initiative:
- Meets only required performance
  - Takes actions to make performance better
  - Achieves extra performance
  - Accepts additional tasks
  - Accomplishes additional tasks
- O. Innovation:
- Makes thinking innovation
  - Makes technical innovation
  - Makes product innovation
  - Makes process innovation
  - Makes organization and culture innovation
- P. Organizational Awareness:
- Understands the value and strategy of an organization
  - Understands formal rules of an organization
  - Realizes informal rules of an organization
  - Realizes non-written rules of an organization
  - Realizes the power relationships of an organization
- Q. Personal Motivation:
- Pursue success for oneself
  - Pursue success for an organization
  - Services to a industry
  - Services to a country
  - Services to the world
- R. Relationship Building:
- Maintains pleasant working relationships
  - Makes non-working contact
  - Makes personal contact
  - Builds personal friendships
  - Achieves deep friendships
- S. Results Orientation:
- Works to meet performance standards
  - Sets challenge objectives
  - Achieves beyond expectation
  - Produces a little result
  - Produces a huge result
- T. Self-Confidence:
- Acts independently and boldly
  - Expresses oneself and criticizes others
  - Expresses oneself but does not criticize others
  - Expresses oneself and acts fiercely
  - Expresses oneself and acts moderately
- U. Self-Control:
- Maintains one's self-control but suffers negative influences

## H. Developing Others:

- a. Gives comfort and stimulation
- b. Gives operational instructions
- c. Gives theoretical instructions
- d. Offers resource and support
- e. Builds a mechanism for talent development

## I. Empathy:

- a. Listens to the concerns of others
- b. Realizes the concerns of others
- c. Responds to the concerns of others properly
- d. Responds to the concerns of others and earns trust
- e. Responds to the concerns of others and obtains performance

## J. Expertise:

- a. Basic vocational abilities
- b. Advanced vocational abilities
- c. Excellent vocational abilities
- d. Authoritative vocational abilities
- e. Multiple vocational abilities

## K. Flexibility:

- a. Gets along with people objectively
- b. Acts and talks moderately
- c. Alters usual modes or procedures to fit a specific situation
- d. Adapts to changes rapidly
- e. Adapts to changes rapidly and effectively

## L. Influence:

- a. Takes action once to influence others
- b. Takes actions twice to influence others
- c. Takes actions more than twice to influence others
- d. Brings out a little impact and effect
- e. Brings out great impact and effect

- b. Maintains one's self-control and keeps calm

- c. Maintains one's self-control and makes counterattacks

- d. Maintains one's self-control and makes constructive counterattacks

- e. Maintains one's self-control and comforts others' emotions

## V. Team Leadership:

- a. Knows merits and demerits of each team member

- b. Conducts meetings effectively

- c. Builds a sensible performance system

- d. Enhances morale of the team

- e. Enhances achievement of the team

## W. Verbal and Written Communication:

- a. Makes oral stimulations

- b. Makes touching persuasions

- c. Makes affecting speeches

- d. Writes something touchingly

- e. Both speaks and writes satisfactorily

## X. Whether is an entrepreneur or not?

0 = No,

1 = Yes.