

# Culture and entrepreneurial opportunity recognition: Evidence from GEM and WVS

Li-Min Chuang<sup>1</sup>, Cheng-Chung Yeh<sup>2</sup>, Chien-Min Huang<sup>3</sup>, Po-Hsiung Hsin<sup>4</sup>

## Abstract

Many studies have addressed opportunity discovery and opportunity exploitation; however, very little research has focused on opportunity recognition. In this study, 17 countries that participated in both GEM and WVS. Our research found that each of the factors studied in this analysis were influential in entrepreneurial opportunity recognition. Furthermore, the factors result in six specific patterns of entrepreneurs. We also examined the stability on the SOM plane of the six patterns of entrepreneurial opportunity recognition. The study reveals interesting patterns of entrepreneurial opportunity recognition in the context of global entrepreneurial activities.

**JEL classification numbers:** C83.M15.O31

**Keywords:** Culture, Entrepreneurial Opportunity Recognition, Global Entrepreneurship Monitor (GEM), World Values Survey (WVS)

---

<sup>1</sup>Department of International Business, Chang Jung Christian University, Tainan 71101, Taiwan; liming@mail.cjcu.edu.tw(L.-M.C.);

<sup>2</sup>Ph.D. Program in Business and Operations Management, Chang Jung Christian University, Tainan 71101, Taiwan; r78462027@mail.cjcu.edu.tw(C.-C.Y.)

<sup>3</sup>Department of International Business, Chang Jung Christian University, Tainan 71101, Taiwan.

<sup>4</sup>Master Program in Business and Operations Management, Chang Jung Christian University, Tainan 71101, Taiwan.

<sup>2</sup> Correspondence: r78462027@mail.cjcu.edu.tw; Tel.: +886-6-2138600

# 1 Introduction

Prior research indicated some research limitations of entrepreneurial research. First, Arenius and Minniti (2005) [1] indicated that their data did not allow them to establish the causal direction between conceptual variables and entrepreneurial behavior. Moreover, they indicated that treatment of country effects was limited to the introduction of dummy variables. Therefore they gave a future research direction that those who follow their study could lead to an unambiguous understanding of how perceptions influence entrepreneurial behavior by following their explorative investigation and use the data including macroeconomic factors, such as technological sophistication and culture. Second, Sternberg and Wennekers (2005) [2] and Engelen, Heinemann, and Brettel (2009) [3] indicated that in the cross-cultural studies, the underlying mechanisms in terms of the causes and effects in differences are still disturbingly unclear, future studies need to build more complex research models that go beyond mere correlation analyses of certain phenomena and national culture. Following these suggestion, we use the Global Entrepreneurship Monitor (GEM) as our research sample [4]. Recent studies indicate that there are additional factors that affect nascent entrepreneurship, such as the use of technology[5], financial status[6,7] and country of residence (in aspects of culture, regulation, and government policies) [8,9].

Many studies have addressed opportunity discovery and opportunity exploitation; however, very little research has focused on opportunity recognition and whether there are similarities or differences between the determinants of entrepreneurial opportunity recognition and national culture across countries. We analyzed Hofstede culture dimension, Global Entrepreneurship Monitor (GEM) and World Values Survey (WVS) data applied the artificial intelligence self-organizing map (SOM) approach to fill this research gap. This research aims to explore the entrepreneurial patterns. We examined literature related to entrepreneurial opportunity recognition and national culture to obtain the direction of research and factors that affect entrepreneurs, and then proposed some purposes of this research:

- (1) To identify and clarify how variables affect entrepreneurs within their own country.
- (2) To assort countries into clusters with discerning features.
- (3) To examines the effect of national culture on the entrepreneurship opportunity recognition.

## 2 Research Design

### 2.1 Research Framework

Differ from the thinking of multivariate analysis, the idea of this framework is that:

- (1) Individualism, uncertainty avoidance and long-term orientation are not independent variables while entrepreneurial patterns are not dependent variable.
- (2) Except micro-level variables, we add some macro-level variables to demonstrate patterns of entrepreneurs.
- (3). We use Hofstede culture dimension, GEM and WVS as our data source to obtain multinational and longitudinal data of entrepreneurs.
- (4) We use SOM for the purpose of solving statistical problems.

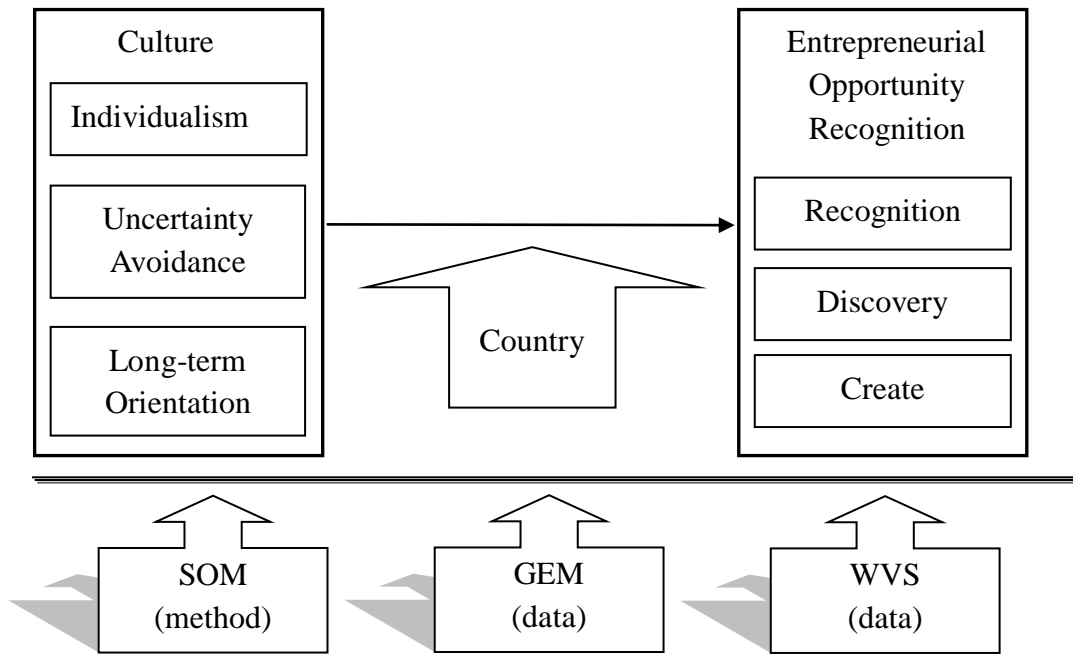


Figure 1 Research Framework

## 2.2 Variable Descriptions

We define the variables as follow:

### 2.2.1 Criterion Variable

The criterion variable is entrepreneurial opportunity recognition. To identify the respondents what were coded as entrepreneurial opportunity recognition and engaged in entrepreneurship.

### 2.2.2 Predictor Variables

Our study includes individual and country level variables to account for entrepreneurial opportunity recognition. The variables include age, experience, education, income status, skill...etc. The detailed descriptions shown as Table 1:

Table 1 Description of predictor variables

Variables	Descriptions of Variables	Original answers to question
Age	The respondents were asked to provide their year of birth.	
Experience	The respondents were asked to answer their experiences about owning or managing a business, any form of self-employment, or selling goods or services to anyone	0="No" 1="Yes"
Knowing other entrepreneurs	Respondents were asked whether they knew someone who started a new business in the past 2 years.	0="No" 1="Yes"

Career choice	Respondents were asked “In your country, most people consider starting a new business a desirable career choice?”	0=“No” 1=“Yes”
Fear of failure	Respondents were asked whether fear of failure would prevent them from starting a new business.	0=“No” 1=“Yes”
Media	Respondents were asked “In your country, you will often see stories in public media about successful new business?”	0=“No” 1=“Yes”
Skill	Respondents were asked whether they have the knowledge, skill and experience required to start a new business.	0=“No” 1=“Yes”
Standard of living	Respondents were asked “In your country, most people would prefer that everyone had a similar standard of living?”	0=“No” 1=“Yes”

Source : GEM

### 3 Research Results

#### 3.1 The Data

##### 3.1.1 Global Entrepreneurship Monitor

In this study, 17 countries were selected in our analysis. We used two criteria to be our screening conditions and by following steps. First, the selected countries are those have participated in GEM. Second, these countries were selected with Hofstede culture dimension and WVS.

##### 3.1.2 World Values Survey

WVS originated in 1981, ten years in western Europe countries for the implementation of the “European Values Survey“, the survey results in stimulating cultural change and can be extended on to the world. Overall, this survey a wide range of international, including: social values, social norms, social issues, social distance, work issues, labor, employment, political attitudes, the state of democracy, gender issues, environmental issues, marriage, family Problems with child rearing . This study will use the following three variables as the dependent variable. It’s includes “Work important in life”, “Friends important in life” and “an opportunity to use initiative”.

Table 2 Computed index values of World Values Survey

Country	Work important in life	Friends important in life	an opportunity to use initiative
U.S.A.	53.8	64.2	61.7
Greece	59.2	42.4	56.2
Netherlands	48.2	60.4	62
Belgium	63	48	49.1
France	69.1	49.9	42.8
Spain	55.9	47.2	43.1
Italy	61.7	35.6	64.5
Denmark	39.5	55	49.7
Sweden	54.4	70.7	51.9
Norway	58.8	59	49.7
Argentina	73.9	50.3	40.7
Brazil	84	57.6	44.7
Japan	49	48.1	49.8
Ireland	50.9	61	58.9
Finland	51.8	51.2	48.1
Croatia	48.3	36.3	55.9
Slovenia	61.7	41.8	78.4

## 3.2 Results

### 3.2.1 Quantifying of SOM

There are some features would influence the final map. Therefore, we use two measurements to represent our data. The first measurement is the quantization error (qe). The second measurement is the topological error (te). In other words, the lower the topological error. Although the literature indicate that the quality of models cannot be evaluated by two measurements only, we still announce that our model have a good quality for the map, where our  $qe=2.0622$ ,  $te=0$ .

### 3.2.2 Data Visualization

Figure 2 represents the principle component (PC) projection. In this analysis, three principal components were extracted out of 15 variables. The x and y axes shows how the data are projected to both principal components and therefore represent the outputs of SOM. In addition, the colors used for visualization in Figure 2 are linked to the map plane. Which means, in this analysis, the color green on the upper left is linked to the bottom left in Figure 4. Furthermore, the “+” symbols stand for the real inputs of data, thus, the existence of clusters in the data has been confirmed.

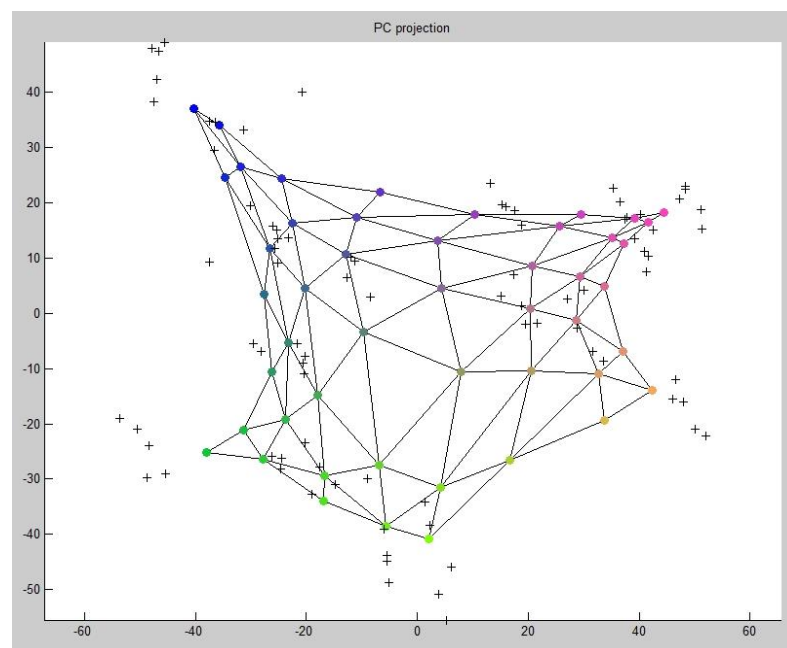


Figure 2 Principal component projection.

### 3.2.3 The Clustering

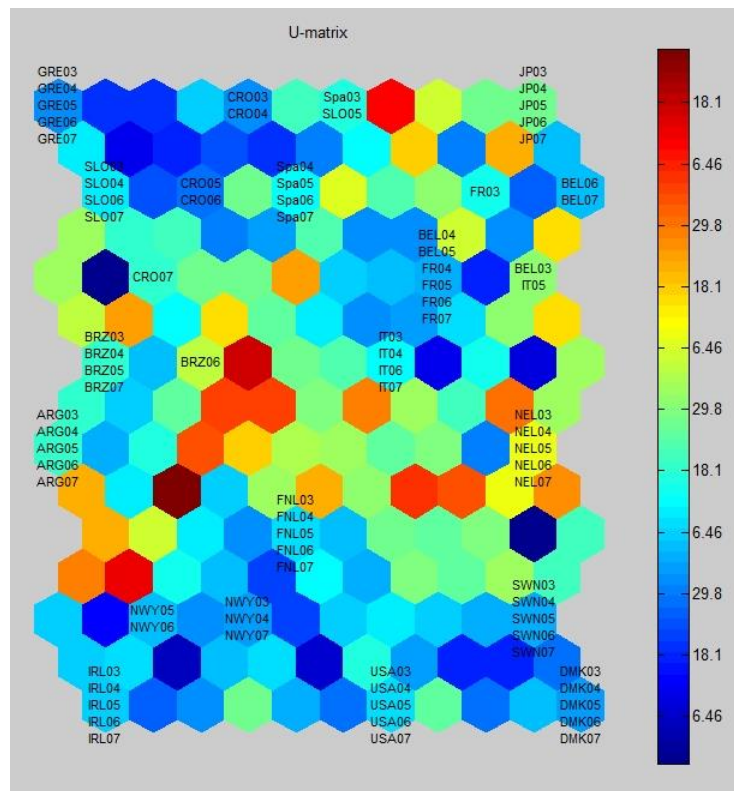


Figure 3 U-matrix.

In order to make the clustering more accurate and the properties of each cluster need to be further analyzed, the Davies-Bouldin

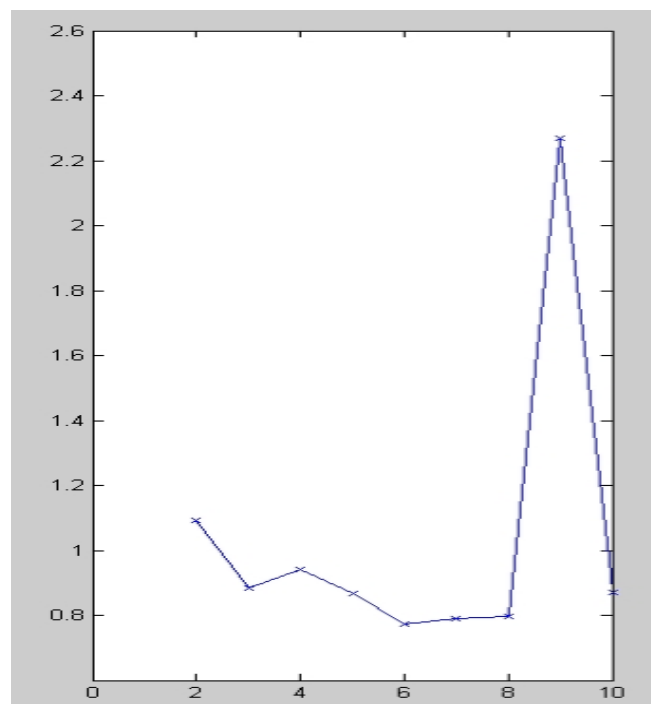


Figure 4 Davies-Bouldin index.





### 3.2.4 Component Maps

The component maps are shown in Figure 7 and provide clear visualization of estimated prototype vectors after training.

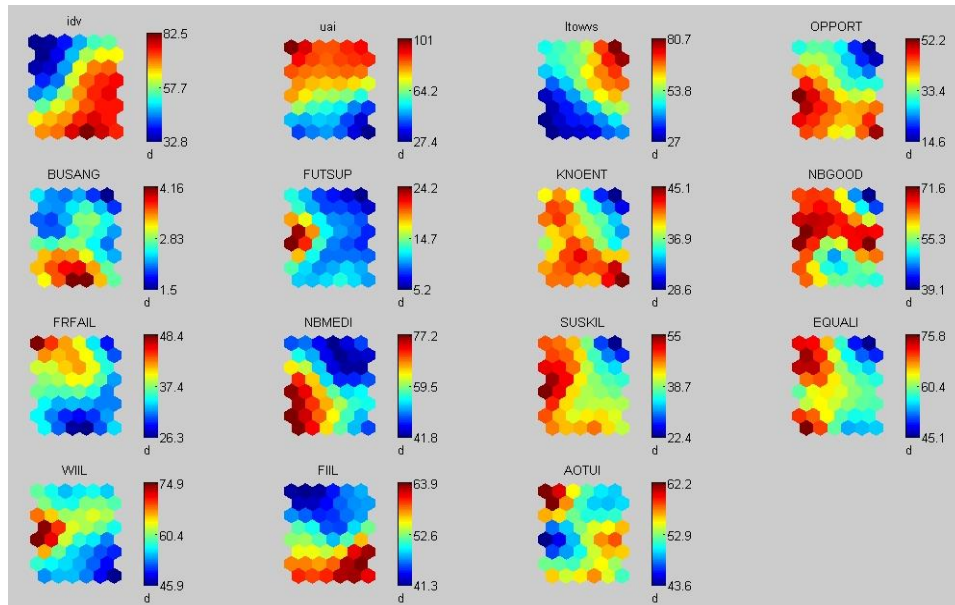


Figure 7 Component maps.

### 3.2.5 Analysis of Clusters

The results of the entrepreneurial patterns are summarized in Table 3, which shows the countries included and distinguishing features of each of the clusters.

Table 3 Division of countries into clusters.

<i>Clusters</i>	<i>Countries</i>	<i>Distinguishing Characteristics</i>
<i>Cluster 1</i> <i>Conservative entrepreneurs</i>	<i>Mainly Greece, Slovenia, Croatia and Spain</i>	<ol style="list-style-type: none"> <li>1. <i>High uncertainty avoidance</i></li> <li>2. <i>Stronger cultural support to entrepreneurship</i></li> <li>3. <i>Having skills to start new business</i></li> <li>4. <i>Similar standard of living</i></li> <li>5. <i>Having opportunity to use initiative</i></li> </ol>
<i>Cluster 2</i> <i>Positive entrepreneurs</i>	<i>Mainly Argentina and Brazil</i>	<ol style="list-style-type: none"> <li>1. <i>High opportunity perception</i></li> <li>2. <i>Expecting to start a new business</i></li> <li>3. <i>Stronger cultural support to entrepreneurship</i></li> <li>4. <i>Knowing more other entrepreneurs</i></li> <li>5. <i>Having skills to start new business</i></li> <li>6. <i>Similar standard of living</i></li> <li>7. <i>Work important in life</i></li> </ol>
<i>Cluster 3</i> <i>Courageous</i>	<i>Mainly Ireland, Norway and Finland</i>	<ol style="list-style-type: none"> <li>1. <i>High individualism</i></li> <li>2. <i>High opportunity perception</i></li> <li>3. <i>Knowing more other entrepreneurs</i></li> </ol>

<i>entrepreneurs</i>		4. <i>Some cultural support to entrepreneurship</i> 5. <i>Having some skills to start new business</i>
<i>Cluster 4</i> <i>Oppression entrepreneurs</i>	<i>Mainly Japan; some France and Belgium</i>	1. <i>High uncertainty avoidance</i> 2. <i>High long-term orientation</i> 3. <i>Low opportunity perception</i> 4. <i>Weaker cultural support to entrepreneurship</i> 5. <i>Don't having skills to start new business</i>
<i>Cluster 5</i> <i>Experienced entrepreneurs</i>	<i>Mainly Italy and Netherlands; some France and Belgium</i>	1. <i>High individualism</i> 2. <i>High long-term orientation</i> 3. <i>Stronger cultural support to entrepreneurship</i> 4. <i>Some opportunity perception</i> 5. <i>Having some skills to start new business</i>
<i>Cluster 6</i> <i>Opportunistic entrepreneurs</i>	<i>Mainly U.S.A, Denmark and Sweden</i>	1. <i>High individualism</i> 2. <i>High opportunity perception</i> 3. <i>Knowing more other entrepreneurs</i> 4. <i>Friend important in life</i> 5. <i>Low uncertainty avoidance</i> 6. <i>Low long-term orientation</i> 7. <i>Some cultural support to entrepreneurship</i> 8. <i>Having some skills to start new business</i>

Cluster1: the conservative entrepreneurs

Cluster 1 is located upper and left side of the map and can be defined as the cluster of countries with conservative entrepreneurs. Mainly countries including Greece, Slovenia, Croatia and Spain. Entrepreneurs in these countries are characterized by a high degree of uncertainty avoidance, high social and cultural support for entrepreneurship and have the ability to start business. The average of entrepreneurs' age in this cluster is older, they know some other entrepreneurs who can give them information or supports, they don't have much managing experiences, their income level are in the middle to lower 33% in their own countries, and their social culture does not much support the entrepreneurships.

Cluster 2: the positive entrepreneurs

Cluster 2 is located in the middle left block of the map and can be defined as the cluster of countries with positive entrepreneurs which the mainly countries including Argentina and Brazil. Entrepreneurs in this cluster have higher confidence to start new businesses and more managing experiences. Besides, these entrepreneurs have higher education degree and therefore they are better at perceiving the opportunities for starting new ventures, and, in addition, they have stronger cultural support to entrepreneurship. In this cluster, although the entrepreneurs have higher income in

their own countries, their experiences, confidence of skills needed to start new ventures and opportunity perception all motivated them into entrepreneurial activities.

#### Cluster 3: the courageous entrepreneurs

Cluster 3 is located in the bottom left corner of the map and can be defined as the cluster of countries with younger and courageous entrepreneurs. The average age of this cluster is younger than other clusters, while these nascent entrepreneurs use novelty technologies and their social network is relatively weak. Which mean that these nascent entrepreneurs may not be able to get information or supports from other entrepreneurs, yet they could use the latest technologies for start new businesses. Besides, they do not have higher education than others and their work status is relatively unstable, but their confidence of having high degree of individualism and high degree of opportunity perception all drive them into entrepreneurial activities.

#### Cluster 4: the oppression entrepreneurs

Cluster 4 is located upper and right side of the map and can be defined as the cluster of countries with oppression entrepreneurs. Mainly countries include Japan; and some France and Belgium. These countries having high degree of uncertainly avoidance and long-term orientation but lower opportunity perception, weaker cultural support to entrepreneurship, and they are lack of confidence of skills needed to start new ventures.

#### Cluster 5: the experienced entrepreneurs

Cluster 5 is located in the middle right block of the map and can be defined as the cluster of countries with experienced entrepreneurs. Entrepreneurs in this cluster have higher individualism and long-term orientation. Besides, these entrepreneurs have higher education degree and therefore they are better at perceiving the opportunities for starting new ventures, and, in addition, they are more optimism to future market expansion. Which corresponded to prior researches that human capital may influence opportunity perception (Shane and Venkataraman, 2000; Dimov and Shepard, 2005). In this cluster, although the entrepreneurs only have some opportunity perception and some skills to start a new business, but they have stronger cultural support to drive them into entrepreneurial activities.

#### Cluster 6: the opportunistic entrepreneurs

Cluster 6 is located in the bottom right corner of the map and can be defined as

the cluster of countries with opportunistic entrepreneurs. Countries here including U.S.A, Denmark and Sweden and these entrepreneurs in this cluster have higher individualism, opportunity perception and knowing some other entrepreneurs who can give them information or supports. Although these entrepreneurs only have some skills and culture supports to start new business, but they are lower uncertainty avoidance and long-term orientation all drive them into entrepreneurial activities.

Besides clusters itself, the U-matrix enables us to observe the movement of the national route in different years. For example, in year 2003, entrepreneurs in France were located in upper right of the map, where we named as cluster 4, but after 2004, entrepreneurs in France were located from the upper right to middle right of the map, where we named as cluster 5. The meaning of this movement is that entrepreneurs in France were optimistic about the entrepreneurial opportunity, while what they were pessimistic about turned out to be optimistic after 2004. For the reason may cause this movement, we found 911 attacks may be the critical reason which influenced economy growth and drove entrepreneurs being pessimistic in 2001. But after 3 years, the entrepreneurs were gradually changing their mind from pessimistic to optimistic.

## **4 Conclusions And Suggestions**

### **4.1 Conclusions**

In our research, countries in the cluster 2 have higher confidence to start new businesses and more managing experiences. Besides, these entrepreneurs have higher education degree and therefore they are better at perceiving the opportunities for starting new ventures, and, in addition, they have stronger cultural support to entrepreneurship. According to these advantages, we can define that entrepreneurs in the cluster 2 are positive entrepreneurs. On the other hand, those entrepreneurs in their countries in the cluster 6 have higher individualism, opportunity perception and knowing some other entrepreneurs who can give them information or supports. Although these entrepreneurs only have some skills and culture supports to start new business, but they are lower uncertainty avoidance and long-term orientation all drive them into entrepreneurial activities. According to the above point of view, their entrepreneurial willing not the highest, but once mastered the chance, they have the best chance to be success.

Finally, we are somewhat surprised by the composition of clusters. The composition of clusters does not fit for the stereotypes of certain countries. For

example, in the stereotype of the United States, we usually think that compared to other countries, the U.S. culture is more supportive to entrepreneurial activities. However, our result suggests that Brazil's culture, compared to other countries, is the most supportive to entrepreneurial activities. In addition, prior researches indicated that higher education may lead to better opportunity perceptions, yet, our result suggest that higher education cannot prevent entrepreneurs from the anxiety of being failure. It indicates that education and knowledge are not enough to disperse the psychological anxiety.

#### **4.2 Opportunities for Future Research and Limitations**

In this research, we acknowledge some research limitations and provide suggestions for future research.

Continuation of the first research limitation, the original data from GEM provides us multidimensional information. However, numbers of samples vary across countries and years, as a result, the aggregated data may not representative of national properties. Even though we use 15 factors and assort the entrepreneurs into 6 clusters, trying to understand the patterns of entrepreneurs in 17 countries for 5 years, different entrepreneurs in different years cannot represent what entrepreneurs would really do when the same group of people in the face of the practice of different situations.

Given these limitations, we suggest that the organizers of GEM can provide information on the national level properties to avoid the phenomenon of data distortion; and provide sufficient amount of samples on behalf of national property. Further, future research should try to obtain longitudinal data, which might better demonstrate the patterns over time. Besides, future research should extend the influential variables. Patterns of entrepreneurs cannot be reviewed by only 15 factors. In addition, the results provide a suggestion to these countries. For example, countries in compensative cluster should make some public policies to lower the anxiety of being failure. Countries in courageous cluster should provide courses to learn more knowledge for the purpose of learning the basics of problem solving.

#### **References**

- [1] Arenius, P., and Minniti, M. (2005). Perceptual Variables and Nascent Entrepreneurship, *Small Business Economics*, 24(3), pp. 233-247.

- [2] Engelen, A., Heinemann, F., and Brettel, M. (2009). Cross-cultural entrepreneurship research: Current status and framework for future studies. *Journal of International Entrepreneurship*, 7(3), pp. 163-189.
- [3] Sternberg, R, and Wennekers, S. (2005). Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data. *Small Business Economics*, 24, pp. 193-203.
- [4] Amorós, J. E., and Cristi, O. (2008). Longitudinal analysis of entrepreneurship and competitiveness dynamics in Latin America. *International Entrepreneurship and Management Journal*, 4(4), pp. 381-399.
- [5] Dvira, D., Sadehb, A., & Malach-Pines, A. (2010). The fit between entrepreneurs' personalities and the profile of the ventures they manage and business success: An exploratory study. *The Journal of High Technology Management Research*, 21(1), 43-51.
- [6] Lerner, M., & Avrahami, Y. (2002). *Global Entrepreneurship Monitor: Israel Executive Report*. Tel Aviv: Tel Aviv University.
- [7] Zacharakis, A. L., & Shepherd, D. A. (2001). The nature of information and overconfidence on venture capitalists' decision making. *Journal of Business Venturing*, 16(4), 311-332.
- [8] Uhlaner, L., & Thurik, R. (2007). Post-Materialism: A Cultural Factor influencing Total Entrepreneurial Activity across Nations. *Journal of Evolutionary Economics*, 17, 161-185.
- [9] Stel, A. V., Storey, D. J., & Thurik, A. R. (2007). The Effect of Business Regulations on Nascent and Young Business Entrepreneurship. *Small Business Economics*, 28(2-3), 171-186.