# A Comparison of Four Measurement Systems and Evaluation Indicators in Entrepreneurship: Evidence from Five Innovation-driven Economies in Asia

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*Abstract*--**The nascent field of entrepreneurship is growing rapidly and attracting increased attention from many sectors, which developed ten evaluation indicators continuously. In spite of the lack of a comprehensive comparison, rankings from those measurement indices were extensively used for investigating, evaluating, and adjusting entrepreneurial policies in different countries. Based on the criteria of academic value and social influence, four index systems were selected for further investigation and thorough comparison. Subsequently, we selected five innovation-driven economies in Asian and using various indicators, examined whether their entrepreneurial performances differed significantly. A comparison with business environment and entrepreneurship rankings showed that Singapore has an entrepreneurship-friendly infrastructure but a negative entrepreneurial atmosphere. A similar situation exists in Hong Kong. By contrast, Japan has few entrepreneurial activities and the least favorable overall entrepreneurial environment in Asia. However, people in Taiwan and South Korea have strong entrepreneurial passion and are willing to actively participate while entrepreneurial environments are improving. In conclusion, Taiwan and South Korea are the more appropriate Asian countries for entrepreneurship in the future. The comparisons in this paper showed that four indices possess a certain level of explanatory power and limitations. Cross-referencing these indices can significantly enhance current understanding of relevant data.**

## I. INTRODUCTION

As entrepreneurial activities become one of the most prevalent trends in the global business arena, research institutions around the world paid lots of attention on those activities, developed measurement indices to thoroughly understand those activities, and tried to utilize those indices to monitor as well as enhance the soundness of entrepreneurial environment. Despite the undisputable significance of entrepreneurship-related issues, diverse measurement or evaluation methods existed because of the extreme complexity of the concepts. However, entrepreneurship has ultimately become a factor in research regarding national competitiveness, innovation, or business environments, whereas entrepreneurship-centred systematic measurement indices or ranking mechanisms are rare.

The nascent field of entrepreneurship is growing rapidly and attracting increased attention from many sectors, which developed ten measurement systems and evaluation indicators continuously, including: World Competitiveness Yearbook (WCY) published by International Institute for Management Development (IMD) in 1996, Kauffman Index of Entrepreneurial Activity investigated by Kauffman Foundation in 1996, Global Entrepreneurship Monitor (GEM) launched by Babson College and London Business School in 1997, Innovation Union Scoreboard (IUS) developed by European Union (EU) in 2000, Doing Business Report conducted by the World Bank in 2004, OECD-Eurostat Entrepreneurship Indicators Programme (EIP) provided by Organization for Economic Co-operation and Development (OECD) in 2006, Global Innovation Index (GII) published by Institut Européurod'Administration des Affaires(INSEAD) in 2009, Global Entrepreneur Indicator(GEI) investigated by Entrepreneurs'Organization in 2010, Global Entrepreneurship and Development Index(GEDI) proposed by Professor Zoltan J. Acs, Entrepreneurship Barometer developed by Ernst & Young in 2011.

Table 1 lists the survey history of entrepreneurship related-indicators. In spite of the lack of a comprehensive comparison and integrated discussion, rankings from those measurement indices were extensively used for investigating, evaluating, and adjusting entrepreneurial policies in different countries; therefore, it is quite common for government to lose their focuses, mistakenly cite the reports, or erroneously interpret the results. The purpose of this study is to review the aforementioned measurement indices and inspect the suitableness of them.

From the 10 entrepreneurship-related measurement systems and evaluation indicators mentioned previously, we determined the scope of this study based on the following considerations: surveys should include the global comparability, and the history and credibility of the executive organizations.

Because the concept of innovation and entrepreneurships are closely linked, entrepreneurship is considered as one of the output of innovation process in many of the indicators. Based on the classification provided by the World Economic Forum (WEF), we divided global economy into three types, that is, element-, efficiency-, and innovation-driven. Subsequently, we selected innovation-driven Asian economies, which include Japan, South Korea, Singapore, Hong Kong, and Taiwan, and using various indicators, examined whether their entrepreneurial performances differed significantly.

TABLE 1 SURVEYS/INDICATOR SYSTEMS OF ENTREPRENEURSHIP

| Title | Year | Institution/Organization | Related-indicator/Item |
|---|---|---|---|
| World Competitiveness Yearbook(WCY) | 1996 | International Institute for Management Development | 1. Competition and Regulations (Ease of Doing Business, Creation of Firms, Start-up Days, Start-up Procedures) 2. Management Practice( Entrepreneurship) |
| Kauffman Index of Entrepreneurial Activity | 1996 | Kauffman Foundation | The Percentage of New Business Creation in the United States |
| Global Entrepreneurship Monitor(GEM) | 1997 | Babson College, London Business School | Total Early-Stage Entrepreneurial Activity Index(TEA Index) |
| Innovation Union Scoreboard(IUS) | 2000 | European Union | Firm Investments, Linkages and Entrepreneurship |
| Doing Business | 2004 | The World Bank | Business Environment |
| OECD-Eurostat Entrepreneurship Indicators Programme(EIP) | 2006 | Organization for Economic Co-operation and Development | 1.Determinants of Entrepreneurship 2.Entrepreneurial Performance(Firms, Employment, Wealth) 3.Impact(Job Creation, Economic Growth, Poverty Reduction, Formalizing the Informal Sector) |
| Global Innovation Index(GII) | 2009 | Institut Européurod'Administration des Affaires | 1.Institutions (Time to Start a Business Days, Cost to Start a Business % Income/Cap) 2.Market Sophistication (Venture Capital deals/tr GDP PPP$) 3. Scientific Outputs (New businesses/1,000 pop. 15–64 yrs) |
| Global Entrepreneur Indicator(GEI) | 2010 | Entrepreneurs' Organization | Net Profit, Job Creation, Economic Outlook |
| Global Entrepreneurship and Development Index(GEDI) | 2010 | Zoltan J. Acs | Rankings of GEDI Index |
| Entrepreneurship Barometer | 2011 | Ernst & Young | New Business Density, Entrepreneurs' Confidence in Their Own Country |

## II. SELECTION CRITERIA

### *A. Theories of Entrepreneurship*

Based on the theories of entrepreneurship, the 10 entrepreneurship indicators can be divided into the following three categories as shown in Figure 1:

(1) Heroes-as-creators-of-trends: entrepreneurs can identify market opportunities ([1]), which examine individuals' entrepreneurial intentions, actions, or decisions in a country; examples include the Kauffman Index, Innovation Union Scoreboard (IUS), and Entrepreneurship Barometer.

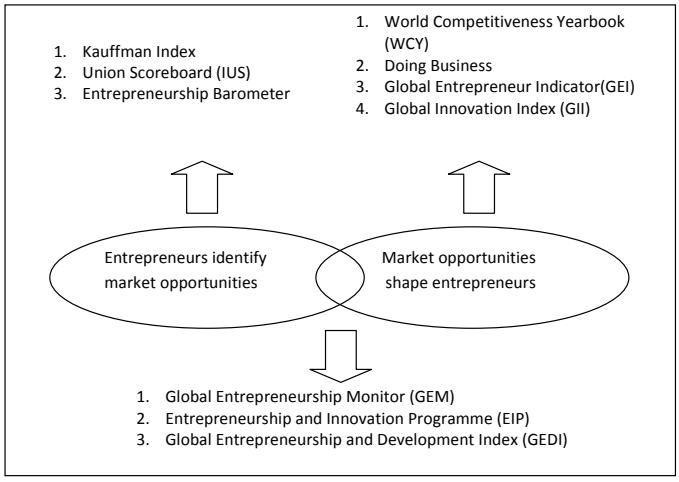


Figure 1 Three types of entrepreneurship indicators

(2) Trends-as-creators-of-heroes: market opportunities shape entrepreneurs ([2]), which acknowledge that regional environments or atmospheres are crucial for forming entrepreneurship; examples include World Competitiveness Yearbook (WCY), Doing Business, Global Entrepreneur Indicator (GEI), and Global Innovation Index (GII), which all emphasize the soundness of local regulations or institutions.

(3) A combination of both "heroes-as-creators-of-trends" and "trends -as-creators-of-heroes" indicators ([3]), which are adopted by scholars who believe that the establishment of new ventures involves the mutual influence and synergistic effects of individuals and environments; thus, both are indispensable. These indicators include Global Entrepreneurship Monitor (GEM), Entrepreneurship and Innovation Programme (EIP), and Global Entrepreneurship and Development Index (GEDI), which also represent recent research trends.

### *B. Unit of Analysis*

The Kauffman Index is the only index that examines single countries. Three indices focus on regional economies, specifically, the Innovation Union Scoreboard (IUS), which examines EU countries; Entrepreneurship and Innovation Programme (EIP), which examines OECD member countries; and the Entrepreneurship Barometer, which is used to investigate G20 economies. Six indices possess global comparability, namely, the World Competitiveness Yearbook (WCY), Global Entrepreneurship Monitor (GEM), Doing Business, Global Innovation Index (GII), Global Entrepreneur Indicator (GEI), and Global Entrepreneurship and Development Index (GEDI).

### *C. Research Scope*

Among the 10 indices, Asian countries that are innovation-driven economies were included in half of the indices. However, at the end of 2011, Taiwan was removed

from the Global Innovation Index (GII) evaluation list; therefore, only four indices satisfy the scope of this study, that is, World Competitiveness Yearbook (WCY), Global Entrepreneurship Monitor (GEM), Doing Business, and Global Entrepreneurship and Development Index (GEDI).

*D. Research Credibility*

Having more than 15 years of history with the World Competitiveness Yearbook (WCY), the IMD is the most experienced research institute in entrepreneurship surveys. Launched shortly after the World Competitiveness Yearbook (WCY), the Global Entrepreneurship Monitor (GEM) also has a long history and established credibility. We divided the indices using a survey history of over five years as the criterion. Six indices satisfied this criterion, that is, the World Competitiveness Yearbook (WCY), Global Entrepreneurship Monitor (GEM), Kauffman Index, Innovation Union Scoreboard (IUS), Doing Business, and Entrepreneurship and Innovation Programme (EIP). These six long-existing surveys were all conducted by credible research institutes, namely, the International Institute for Management Development, Babson College, Kauffman Foundation, the World Bank, and the European Union, which are benchmark, representative, and authoritative institutes and organizations.

*E. Summary*

Based on the four principles mentioned previously, we determined the scope of this study and identified three surveys that fully satisfied the research requirements, as shown in Table 2. They were the World Competitiveness Yearbook (WCY), Global Entrepreneurship Monitor (GEM) and Doing Business.

Although Global Entrepreneurship and Development Index (GEDI) only had four year of survey history, the research outcome was widely recognized not only in academia but had impact on policy-making. As a result, this study considered the GEDI should be selected as a research object. Based on the criteria of academic value and social influence, four index systems were selected for further investigation and thorough comparison.

## III. EVALUATION INDICATORS REVIEW

*A. World Competitiveness Yearbook (WCY)*

The methodology of WCY divides the national environment into four main competitiveness factors. Each of these four factors has been broken down into five sub-factors with 5% weight (5%x20 sub-factors=100%). Indicators representing sub-factors might be adjusted each year due to external issues; two-thirds of the indicators are objective data, and the rests are derived from surveys. For calculating the result of ranking, indicators are firstly standardized and then multiplied by different weightings (1 for objective data and 0.5 for survey data) to obtain values of sub-factors; multiplying 5% with each sub-factor and get the average of the sum of those sub-factors would then be used for understanding the ranking of different countries.

Of the WCY's more than 300 indicators, five were related to entrepreneurship, including entrepreneurship, ease of doing business, creation of firms, start-up days (adopted from Doing Business) and start-up procedures (adopted from Doing Business). Although Taiwan got ranked number one on entrepreneurship in 2012, the definition and the data collection for this indicator were questionable. Single-item is common for measuring entrepreneurial intention (Krueger, Reilly, & Carsrud, 2000), but the concept of entrepreneurship is quite complex, so is the way for measuring it. In other words, using single item for measuring entrepreneurship might face the challenge of reliability and validity.

The results showed that compared to neighbouring Asian countries and regions, such as Singapore, Hong Kong, Japan, and South Korea, Hong Kong was ranked among the top five countries in the world for all five indices, exhibiting globally superior performances in the three indices that used single-item questionnaires as the primary data collection method and the indices that comprised objective data ranking items. Despite its relatively low ranking regarding entrepreneurship, Singapore scored high for overall environment, which indicates that the Singaporean government has made significant efforts to create an entrepreneurship-friendly environment. By contrast, Japan and South Korea, which are dominated by large enterprises or groups, received lower rankings in entrepreneurship-related indices compared to that of other Asian countries.

TABLE 2 CRITERIA OF SELECTING INDEX SYSTEM

| Criteria / Title | Entrepreneurship Related-Items | Global Comparison | Innovation-Driven Economies in Asia | Research Credibility |
|---|---|---|---|---|
| **WCY** | ✓ | ✓ | ✓ | ✓ |
| **GEM** | ✓ | ✓ | ✓ | ✓ |
| **Doing Business** | ✓ | ✓ | ✓ | ✓ |
| **GEDI** | ✓ | ✓ | ✓ | |
| IUS | ✓ | | | ✓ |
| Kauffman Index | | | | ✓ |
| EIP | ✓ | | | ✓ |
| GII | ✓ | ✓ | | |
| GEI | ✓ | | | |
| EB | ✓ | | | |

TABLE 3 RESULTS OF FIVE INNOVATION-DRIVEN ECONOMIES IN ASIA: WCY RELATED-ITEMS

| Item \ Country/Economy | Taiwan | Singapore | Hong Kong | Japan | South Korea |
|---|---|---|---|---|---|
| Entrepreneurship | 1 | 23 | 3 | 54 | 16 |
| Ease of Doing Business | 9 | 2 | 1 | 36 | 40 |
| Creation of Firms | 17 | 2 | 1 | 34 | 48 |
| Start-up Days | 24 | 3 | 3 | 44 | 16 |
| Start-up Procedures | 5 | 5 | 5 | 43 | 16 |

Source: 2012 World Competitive Yearbook

WCY is the first measurement system that includes indicators about entrepreneurship, indicating that entrepreneurship has long been considered as a critical issue by academia. However, the dimension and the scope of entrepreneurship are still inconclusive topics; the comparison of different countries is even more complicated if not impossible to precisely measure this concept. For the above-mentioned five items in WCY, two of them are objective data quoted from Doing Business report, and the rest three items are collected from survey. However, single-item might not be able to capture the essence of the concept, the design, the process, and the control of collecting survey data might also jeopardize the results for inference. In conclusion, before applying results of different measurement systems, it is critical to understand the definition of the concept used by the measurement system and the process of collecting related data; otherwise, logical error and other kinds of inferential mistakes might be inevitable.

*B. Global Entrepreneurship Monitor (GEM)*

The Global Entrepreneurship Monitor (GEM) is an international entrepreneurship survey established by academics. In this survey, the Adult Population Survey (APS) and the National Expert Survey (NES) are used to establish a complete multinational database. This is one of the largest international cooperation projects in entrepreneurship research.

GEM measures TEA (Total Early-Stage Entrepreneurial Activities) and EB Rate (Established Business Ownership Rate). TEA could be further divided into NE Rate (Nascent Entrepreneurship Rate) and BE Rate (Baby Entrepreneurship Rate), the former represents the percentage of 18-64 population who are currently a nascent entrepreneur (less than 3 months) while the latter is the percentage of 18-64 population who own a baby entrepreneur (established for more than 3 months but less than 42 months); EB rate measure the percentage of 18-64 population who own a entrepreneur for more than 42 months. The dimensions of Adult Population Survey APS) are attitudes, activity, and aspiration; on the contrary, the Nation Expert Survey (NES) utilizes face-to-face interview to understand the entrepreneurial framework condition of a country.

Taiwan's total early-stage total entrepreneurial activities (TEA) scored approximately 7.9 (2011), slightly higher than the 7.8 (2011) achieved by South Korea. This result indicated that Taiwan was the country with the most prosperous entrepreneurial activities, followed by Singapore (TEA = 6.6 in 2011) and Japan (TEA = 5.2 in 2011). By contrast, entrepreneurial activities in Hong Kong declined to a low point (TEA = 3.6 in 2009).

Compared to other measurement systems GEM is the first cross-national survey that takes both theoretical and practical aspects of entrepreneurship into consideration; GEM also emphasizes the dynamic of entrepreneurship, argues that entrepreneurship activities could be divided into different stages, and uses TEA to reflect the development of entrepreneurship activities in a country. Moreover, in order to get a better understanding of the macro environment, qualitative data is collected to explore opinions from experts in related area. However, while reflecting the popularity of entrepreneurship activities in different countries, the reality that GEM does not provide information about the ranking of different nations is considered a flaw of this measurement system.

*C. Global Entrepreneurship and Development Index (GEDI)*

According to Acs and Szerb (2012), entrepreneurship is influenced by both individuals and institutions. Therefore, 14 pillars of survey data from the GEM and 14 pillars of institutional variable data from international professional organizations were used as the personal variables for Global Entrepreneurship and Development Index (GEDI).

Based on GEM data, GEDI utilizes attitude, activity, and inspiration as individual variables, and adopts three principles proposed by Acs & Szerb (2010) to choose institutional level variables, including: (1) following the same logic as individual level variables, (2) with precise definition and explanation power, and (3) avoiding repeated variables.

TABLE 4 RESULTS OF FIVE INNOVATION-DRIVEN ECONOMIES IN ASIA: TEA INDEX

| Index \ Country/ Economy | Taiwan | Singapore | Hong Kong | Japan | South Korea |
|---|---|---|---|---|---|
| TEA Index | 7.9 ( 2011 ) | 6.6 ( 2011 ) | 3.6 ( 2009 ) | 5.2 ( 2011 ) | 7.8 ( 2011 ) |

Source: 2010 & 2011 GEM Report

TABLE 5 RESULTS OF FIVE INNOVATION-DRIVEN ECONOMIES IN ASIA: GEDI

| Index \ Country/ Economy | Taiwan | Singapore | Hong Kong | Japan | South Korea |
|---|---|---|---|---|---|
| Ranking | 11 | 12 | 30 | 29 | 26 |
| GEDI Index | 0.48 | 0.47 | 0.32 | 0.33 | 0.35 |

Source: 2012 GEDI Report

For indicators, GEDI adopts 14 indicators from GEM (some of the indicators are the combination of two indicators), and 14 institutional variables derived from internationally recognized professional institutions, including: European Commission Survey on Entrepreneurship, Gallup, and World Bank. Subsequently, these two types of data were subjected to cross-multiplication and combination. Countries were ranked according to the total scores that resulted. The 14 pillar indicators are as follows: Opportunity Perception、Start-up Skills、Fear of Failure、Networking、Cultural Support、Opportunity Start-up、Technology Sector、Quality of Human Resources、Competition、Product Innovation、Process Innovation、High Growth、Internationalization、Risk Capital.

Taiwan was ranked in first place for Asia (11th globally), followed by Singapore (ranked 12th), South Korea (ranked 26th), Japan (ranked 29th), and Hong Kong (ranked 30th). Singapore was only one place behind Taiwan, with a minimal difference in the scores. Hong Kong, Japan, and South Korea shared similar scores and rankings.

Founded on the results of GEM, GEDI makes a further step to include related variables collected by other professional institutions and calculates the gaps of entrepreneurship development among different countries by combining individual and institutional variables. GEDI could not only demonstrates status of entrepreneurship development of different countries but also connect a country's economic development stages with its policy focus. However, in order to generate the ranking of different countries, GEDI integrates theories from entrepreneurship, economics, and other area, but it could be found that, under thorough scrutiny, the choice of variables is actually questionable. For individual variables, more suitable standard should be constructed; for institutional variables, more cautious examination is needed.

*D. Doing Business*

This survey was launched by the World Bank to provide a just and objective measurement tool that enables member countries to evaluate the business environments of various countries and regions and can also be used as a reference for governments to improve domestic business environments.

Since the publication of the first report, the indicators have been modified for several times; in the latest version, 11 indicators are selected as dimensions for the investigation. The data collection process is divided into two main parts; the first part is to inspect business regulations for different countries, and the second part measures the time, the process, and the cost needed for interacting with public agencies responsible for the above-mentioned indicators. Local partners from different countries (including lawyers, accountants, judges, engineers, architects, business people, and public officials, and etc.) cooperate with World Bank to collect necessary data and help analyze the collected data with Standardize Case. In order to be objective and professional, unweighted average is then calculated to derive ranks of different countries on 11 indicators and the total rank for each country.

Based on the survey results, Singapore was ranked first both in Asia and among 185 economies globally. Hong Kong and South Korea followed, ranking second and eighth, respectively. By contrast, Japan's ranking was less satisfactory at 24th, and Taiwan was ranked 16th.

TABLE 6 RESULTS OF FIVE INNOVATION-DRIVEN ECONOMIES IN ASIA: DOING BUSINESS

| Items \ Country/ Economy | Taiwan | Singapore | Hong Kong | Japan | South Korea |
|---|---|---|---|---|---|
| Ease of Doing Business Rank | 16 | 1 | 2 | 24 | 8 |
| Starting a Business | 16 | 4 | 6 | 114 | 24 |
| Dealing with Construction Permits | 9 | 2 | 1 | 72 | 26 |
| Getting Electricity | 6 | 5 | 4 | 27 | 3 |
| Hiring and Firing Workers | n/a | n/a | n/a | n/a | n/a |
| Registering Property | 32 | 36 | 60 | 64 | 75 |
| Getting Credit | 70 | 12 | 4 | 23 | 12 |
| Protecting Investor | 32 | 2 | 3 | 19 | 49 |
| Paying Taxes | 54 | 5 | 4 | 127 | 30 |
| Trading Across Borders | 23 | 1 | 2 | 19 | 3 |
| Enforcing Contracts | 90 | 12 | 10 | 35 | 2 |
| Resolving Insolvency | 13 | 2 | 17 | 1 | 14 |

Source: Doing Business Report 2013

Among four measurement systems analyzed in the current study, Doing Business is the only one entrepreneurship survey initiated by practitioners. The results of Doing Business could not only act as the reference for practitioners for constructing global strategies and making decisions of financial decisions, but also as guidelines for the public sectors to carefully examine the soundness of internal environment and strengthen competitive advantage by improving legal systems and regulations for promoting entrepreneurship activities. However, as mentioned earlier, Doing Business does pay its attention to the physical infrastructure but neglect the soft infrastructure that is considered critical in the era of knowledge economy. Therefore, it is concluded that, in the current study, Doing Business should be treated as the reference for reducing "entry risk" for nascent entrepreneurs, instead of the basis for judging the friendliness, atmosphere of the entrepreneurship environment for a specific country.

## IV. RESEARCH FINDINGS AND CONCLUSIONS

### *A. Comparisons of Rankings of Different Evaluation Systems*

Compared with WCY's survey regarding perceptions of entrepreneurship, the GEM's TEA index emphasized specific entrepreneurial activities. Taiwan was ranked first in Asia on both indices, indicating that only a minimal discrepancy existed between Taiwanese people's perceptions of entrepreneurship and their actual behaviours. By contrast, Singapore and South Korea had poor rankings regarding people's perceptions of entrepreneurships, although practically, people actively participated in establishing new ventures. Although Hong Kong's rating regarding entrepreneurship perceptions was exceptional, people's actual behaviours were poor. Japan, whose population in the start-up stage outnumbered that of Hong Kong, was ranked the lowest of all 59 economies in the entrepreneurship survey, with approximately five in every 100 people engaging in entrepreneurial activities at the time of the survey.

Although the personal variables in Global Entrepreneurship Monitor (GEM) comprised half of the Global Entrepreneurship and Development Index (GEDI) measurement items, the ranking results of the two surveys differed, which demonstrates the significant influence of institutional variables. Although Taiwan and South Korea shared similar TEA indices, South Korea's overall Global Entrepreneurship and Development Index (GEDI) ranking was significantly inferior to that of Taiwan, highlighting that the potential for improvement in South Korea's overall level remains. By contrast, although the number of people engaging in TEA in Singapore was lower than that in Taiwan and South Korea, Singapore's Global Entrepreneurship and Development Index (GEDI) performance was similar to that of Taiwan and exceeded that of South Korea. This indicates that Singapore possesses a level of overall environmental soundness that exceeds that of other Asian countries. Hong Kong and Japan showed poor performances in both the Global Entrepreneurship Monitor (GEM) and Global Entrepreneurship and Development Index (GEDI); thus, improvements to their individual and overall dimensions should be implemented.

A comparison with business environment rankings showed that despite a leading global ranking regarding business environments, Singapore's rankings for entrepreneurship and TEA were significantly inferior to those of other Asian countries. In other words, Singapore has an entrepreneurship-friendly environment but a poor overall entrepreneurial atmosphere. A similar situation exists in Hong Kong. By contrast, Japan had few entrepreneurial activities and the least favourable overall business environment in Asia. However, the situations in Taiwan and South Korea were satisfactory. For these countries, people have strong entrepreneurial passion and are willing to actively participate while entrepreneurial environments are improving. In conclusion, Taiwan and South Korea are the more appropriate Asian countries for entrepreneurship in the future.

The comparisons in this paper showed that all four indices possess a certain level of explanatory power and limitations. Cross-referencing these indices can significantly enhance current understanding of relevant data.

### *B. Gaps between Entrepreneurship and Entrepreneurial Activities*

Although issues about the design, the process, and the contents of different measurement systems deserve further investigation; gaps and discrepancies from the results of four measurement systems could be easily identified. The major difference, after a deeper inspection, comes from the measurement difference of the concept entrepreneurship, which is then reflected on the performance of entrepreneurship, entrepreneurial activities, and the entrepreneurial environment.

TABLE 7 RANKINGS OF DIFFERENT EVALUATION SYSTEMS

| Country/ Economy / Index | Taiwan | Singapore | Hong Kong | Japan | South Korea |
|---|---|---|---|---|---|
| Ranking of WCY | 1 | 23 | 3 | 54 | 16 |
| TEA Index | 7.9 ( 2011 ) | 6.6 ( 2011 ) | 3.6 ( 2009 ) | 5.2 ( 2011 ) | 7.8 ( 2011 ) |
| Ranking & GEDI Index | 11(0.48) | 12(0.47) | 30(0.32) | 29(0.33) | 26(0.35) |
| Ranking of Doing Business | 16 | 1st | 2 | 24 | 8 |

TABLE 8 COMPARISON OF ENTREPRENEURSHIP AND ACTIVITIES

| Entrepreneurship / Entrepreneurial Activities | Low | High |
|---|---|---|
| Low | Japan | Hong Kong |
| High | Singapore, South Korea | Taiwan |

For example, from the results of those measurement systems, citizens in Hong Kong seem to have a high degree of entrepreneurship, while in reality they did not actively participate in entrepreneurial activities. On the contrary, while, based on the results of those measurement systems, Singapore and South Korea do not perform well on entrepreneurship, but people living in these two countries do participate in entrepreneurial activities. From the results of Taiwan and Japan, the discrepancies could not be found. Japanese do not demonstrate a high degree of entrepreneurship and do not actively participate in entrepreneurial activities; Taiwanese people not only demonstrate a high degree of entrepreneurship, but also actively try to establish their own business. Comparison of the results on entrepreneurship and entrepreneurial activities of different countries in Asia is provided in Table 8

From the results of those measurement systems, the entrepreneurial environment in Hong Kong is ranked the second among all the countries and citizens in Hong Kong also demonstrate a high degree of entrepreneurship; however, promoting entrepreneurial activities is quite difficult. The entrepreneurial environments of Singapore and South Korea are considered to be good enough; although people from these two countries do not demonstrate a high degree of entrepreneurship, they do actively engage in entrepreneurial activities and generate a positive performance. From a historical point of view, big groups play important roles in the industrial development of Japan; therefore, Japanese do not demonstrate a high degree of entrepreneurship in an unfriendly entrepreneurial environment and feel hesitate to establish their own business. Although the entrepreneurial environment in Taiwan is not the best among those countries, Taiwanese people not only demonstrate a high degree of entrepreneurship but also bravely engage in entrepreneurial activities. In conclusion, the government in Taiwan should make one step further to go beyond focusing on the steady improvement of entrepreneurial environment, thoroughly review its weakness, and try to encourage more entrepreneurs to establish their own businesses.

### *C. Future Research*

From the fast development of different measurement systems, it could be concluded that studies on entrepreneurship are quite popular. In the current study, only five measurement systems and five innovation-driven economies (Taiwan, Singapore, Hong Kong, South Korea, and Japan) are selected for comparison; other measurement systems and countries could be used for comparison in future studies. Moreover, researchers are encouraged to choose countries based on the categories proposed by WEF (World Economic Forum) to compare the performance of entrepreneurship among factor-driven, efficiency-driven, and innovation-driven countries.

Moreover, it is also plausible to compare Taiwan with countries that have a tight relationship with the economical development of Taiwan, such as China and the U.S. In order to play a key role in the field of entrepreneurship study, researchers are also encouraged to not only have a thorough understanding of different measurement systems as well as important studies in the world, but also try to construct a measurement system that could take both theoretical and practical aspects into consideration.

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