DEVELOPING THE COUNTRY BRAND OF TAIWAN FROM THE PERSPECTIVE OF EXPORTS

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ABSTRACT

People are familiar with the concept of product branding, but the concept of nation branding has just emerged in recent years. It is a significant forward-thinking trend. The related researches about nation branding are relatively few. The scopes include exports, governance, culture, people, tourism, immigration and investment. Taiwan is an island country that is lacking in natural resources, so international trade is very important. The purpose of this study is to explore the suitable export products to develop Taiwan's brand as a nation. This study is analyzed using a two-stage method. The first stage uses the Fuzzy Delphi method to screen items. Then we used the Fuzzy AHP method to evaluate the weights of items. The results showed that the important items are "IC design", "smart phone", and "nanotechnology products". The Taiwan government can make the development strategy about nation branding based on these products.

Keywords: Nation branding, Exports, Fuzzy delphi, Fuzzy AHP, Taiwan

INTRODUCTION

Compared with the concept of product branding, nation branding is a relatively new trend. From the perspective of rapid globalization where different countries become closely linked through trade, a country can be merely considered a geographical territory. Now a country can be seen as a global mark and brand (Nömm, 2007). Take the country as a product and we can use the branding techniques to improve its image. From a marketing point, nation branding can help sell a country's products and promote its place (Fan, 2006). Nation branding is a very important concept. Therefore, in recent years, some governments have become more active in their campaigns. An example is South Korea when it set up a "National Brand Committee" to promote the related

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policies. Obviously following business and product strategies, the concept of branding has been extended to the national level. It has become the new top issue (Fan, 2009). Taiwan is an island country. The land area is small and not so renowned in the world. Making Taiwan compete in the international market with other countries in terms of tourism, investment, talents, is not easy. So, how to strengthen the Taiwan brand is a very important task. Anholt (2000) proposed that a country brand is composed of six dimensions. It includes "export", "governance", "culture and heritage", "people", "tourism", "investment and immigration". The six dimensions cover all the possible impact factors related to nation branding. In the minds of consumers, product brand awareness and country brand impression are often the same. Establishing the brands of export products is the most effective way to build and maintain the brand of the country. When one mentions some international brands such as Nike and Coca-Cola, one will immediately think of the United States. If one sees the SONY brand, it is immediately associated with Japan. The geographical location of Taiwan is surrounded by the sea and Taiwan is insufficient in natural resources. International trade is the foundation of Taiwan's economic development. Therefore, developing export brands is an appropriate and important way to build the country as a brand. However, developing a local brand into an international brand is not that easy. Hence, building a country brand also requires long-term strategies and operations (Zeng, 2008). Therefore, export products play a very important role in this aspect. It is the best means to enhance the country brand. And it is also the key factor in creating sustainable development.

This study selected the country's export products of six dimensions as the base of this research, to assess the most suitable products for the enhancement of nation branding. The results can offer some suggestions to the government and it can be a basis for further research in the future.

LITERATURE REVIEW

Nation branding

The concept of nation branding was proposed by Ham (2001). This refers to each country having its own brand, just like a product. Nation branding relies on the trust and satisfaction of customers. He believes that most people often talk about a country just like the general characteristics of a product, and tend to put some labels on the country. Indeed, nation branding involves government operations that will make the whole country as a brand. The country's government can employ the marketing methods used in the business community to promote the nation as a brand. The constituent elements of nation branding are relatively complex. A country brand is mainly decided by the current state, geographical location, natural environment, economic, political and cultural conditions. Of course, it is also subject to the historical situation and development prospects. Country-specific objects (including natural objects, cultural products, etc.), human elements (ancient, modern, contemporary celebrities), events (famous event), will be a solid foundation to establish the country brand (MBAlib, 2013). Anholt (2009) proposed six major factors that comprise a country brand image, and these include Exports, Governance, Culture and Heritage, People, Tourism, Investment and Immigration. They are explained as follows:

1. **Exports:** It includes the unique advantages of the country's science and technology level, creativity and special industries.
2. **Governance:** This is the people's perception of the government in terms of ability and integrity,

respect for citizens' rights and fair treatment, and the global behavior in the aspect of international peace and security, environmental protection, and world poverty.

3. **Culture:** culture-oriented perspective is a measure of a country's heritage, its contemporary culture from music, film, art and literature, and the country's best sport.

4. **People:** the degree of people-friendliness. It measures how welcome the respondents feel when visiting a country. In addition, it is a measure of the attractiveness of the residents from a personal as well as a human resources professional standpoint on how willing the respondents were in hiring from the country's pool of talents.

5. **Tourism:** Assessing a country's tourist attraction. It is divided into three main areas: 'natural scenery', 'historical buildings and monuments' and 'vibrant city life'.

6. **Immigration and Investment:** A measure of the national ability to attract funds and talents, determining whether people come to the country to study, work or travel, while taking into account the country's economic prosperity, equal opportunity, and assessing whether the place provides a high quality of life.

Tourism   Exports

People   Nation Brand   Governance

Culture   Investment and immigration

Figure 1: Nation branding hexagon diagram

Taiwan as a brand

Faced with globalization and knowledge economy, the profit and threshold of manufacturing technology gradually reduced. Some advanced countries have given up manufacturing and focused on marketing instead. The quality of the products is the key factor to enhance the value of the brand. Taiwan's Ministry of Economic Affairs continues to invest in research and innovation, and also to promote the concept of branding. This can help the 'Taiwan brand' grasp a favorable spot in the global market in the future (MOEA, 2007). In the past, Taiwanese products once gave the impression of being poor in quality or cheap to the foreign consumers. But that image has now improved to that of being high quality and inexpensive. Taiwan is currently in the promotion stage of its national image and aggressively building a national brand. The Tourism Bureau uses the 'Taiwan - Touch your Heart' tourism campaign. The Trade Bureau uses the slogan, 'Innovative Taiwan', to promote the image of Taiwan's industrial sector as one that is innovative, and uses the slogan 'Taiwanese Excellence' to promote Taiwan's high quality products. The government executed the 'Branding Taiwan Plan' to foster potential businesses and industries and let the characteristics of Taiwan shine brightly globally (Zeng, 2008). It was suggested for Taiwan to make the development strategies of nation branding from a cultural perspective based on the promulgation of its movies, TV dramas and pop music (Chen *et al.,* 2013). According to the study results of Chen *et al*. (2012), when branding Taiwan for tourism, the historic buildings and monuments are the most important dimension. The festivals, culture and foods are suitable in developing Taiwan as a brand. This study will adopt "export" as the research direction. And we continue to explore which products are suitable to establish Taiwan as a brand. Therefore, this study will be using Taiwan's export products to discuss Taiwan's nation branding.

Export products of taiwan

Since nation branding is a relatively new study field (Papadopoulos and Heslop, 2002), the relative researches are not yet that comprehensive. We can't find any articles as a basis to construct the research framework of establishing the Taiwan brand from export products. Therefore, this study took the industrial classification standard of the Directorate General of Budget, Accounting and

Statistics, Executive Yuan 2006 (TIER, 2007) as the basis, and then they divided it into six categories of export items. They are (A) Agricultural products and food, (B) Communications products, (C) Information products, (D) Emerging industry, (E) Semiconductor industry and (F) Traditional industries. They are described as follows:

Agricultural products and food
According to the statistical data of Taiwan Agri. Exporter (2011), the total export value of Taiwan's agricultural products is US$ 3,985 million. Taiwan's main agricultural products for export are rice, tea, flowers, fish and seedlings. These are world renowned. And the data from the Taiwan Souvenirs (2013) show that wine and pastry are very popular with foreign tourists in recent years. These products became the most representative products of Taiwan. Agricultural products involve the use of natural resources, agricultural materials and technology to engage in farming, forestry, fisheries, and livestock to produce the goods. Food refers to anything that humans can chew or drink. In this study, based on the information taken from the Council of Agriculture and the Ministry of Transportation Bureau, we select some of the country's most unique export products such as rice, tea, fruits, vegetables, flowers, snacks, wine, fish, candies and cookies (cakes) as our evaluation items.

Technological industry
The science and technology field consists of many products. According to the Industrial Development Bureau (MOEA IDB, 2011), that includes the computer and information hardware industry, telecommunications industry, semiconductor industry, optical industry, software, digital content industry, and internet service industry. This study will divide them into three classifications: communications products, information products and the semiconductor industry.

Communications products
The information and communication technology (ICT) industry has a wider scope, and the products are more diverse. The communications industry in general can be divided into three categories, personal mobile devices, networking equipment, and telecommunication components. The personal mobile device category consists of the smart phone, satellite positioning systems, electronic reader; communications equipment in the network consists of wireless broadband communications equipment, and optical communication equipment. In this study, there are six products according to the Ministry of Economic Affairs and Communications of Taiwan's industrial network classification: smart phones, satellite positioning systems (GPS), wireless broadband communications equipment, consumer communication products, electronic reader and optical communication equipment.

Information products
This study narrowly classifies the information industry. It consists of the computer hardware and software. The related products such as computer, tablet and motherboard belong to this category. For the software part, the Trend Micro Company resolved the world's first virus (Melissa) problem within 24 hours. The products of this category are selected according to the Market Intelligence & Consulting Institute (MIC) and Taiwan's ICT industry development status. We summed it up into seven products: notebook, software (antivirus, game), LCD monitor, tablet PC, mini-projector, dynamic random access memory (DRAM) and motherboard.

Semiconductor industry
The semiconductor products can be divided into integrated circuits (IC), split-style components and optoelectronic semiconductors (Kuo, 2007). Most foreign companies belong to the vertical integration type. Its integration are from design, manufacturing, packaging to testing, and even system integration. Due to the rapid development of the semiconductor industry, it has become capital-intensive, technology-intensive, market and product innovation intensive, and all of these factors made this industry evolve into the horizontal division type. The semiconductor industrial chain is divided into design, mask, manufacturing, testing, packaging, testing and product marketing (Kuo, 2007). This study presented seven products in the semiconductor industry

category, including IC packaging & testing, IC mask, IC design, IC manufacturing, light emitting diodes (LED), foundry and semiconductor laser sensor (CMOS).

Emerging industry
The Council for Economic Planning and Development (CEPD) of Taiwan proposed the "upgrading of the traditional industries competitiveness program" in 1999, in order to quickly upgrade the traditional industries. The important and strategic industries are defined including: digital 3C, precision electronic components, precision machinery equipment, aerospace, biomedical, green technology and advanced materials. These all belong to the scope of emerging industries. The Ministry of Economic Affairs (MOEA) Green Trade Project Office (GTPO) proposed to promote the development of green industries in 2011, such as LED optoelectronics, renewable energy equipment, electric vehicles and the environmental protection industry. The Bureau of Energy has a "Dawning Green Energy Industry" solution that included solar photovoltaic, LED lighting, wind power, bio-fuel, hydrogen and fuel cells and communication and electric vehicles.This study proposed seven products in emerging industries: electric cars, solar energy products, hydrogen and fuel cells, medicine and health food, nanotechnology products, green building and green energy.

Traditional industries
There is no clear definition about the traditional industry. The government agencies or academic institutions also have no clear opinion. The standard of definition usually depends on the user's purpose or the difficulty of information obtained. The government's statistics units, which tend to gather and compare the information conveniently, usually uses profession to define the scope of traditional industries. The manufacturing sector is divided into "traditional industries", "basic industries" and "technology-intensive industries" by the Accounting Director-General of Budget, Accounting and Statistics (2011). This study only adopted the "traditional industries" portion. The textile, bicycle and fitness equipment are the most represented in Taiwan. This study proposed seven products in traditional industries: textiles, bicycles, glass products, fitness equipment, automobiles, metal chemical products and golf products.

METHOD

Study framework
The purpose of this study is to look for the core products that can establish Taiwan as a brand. The research framework is based on the literature and data collection from the Ministry of Economic Affairs, Ministry of Finance, the Council of Agriculture, Industry Bureau, Ministry of Economic Affairs Communications Industry Development Association and other export statistics. These were aggregated into six categories of export products: (A) Agricultural products and food, (B) Communications products, (C) Information products, (D) Emerging industry, (E) Semiconductor industry and (F) Traditional industries. And there are six to eight products within the various categories, with a total of 42 items for export.

Survey design and objects
This study adopts a two-stage survey using the experts' questionnaire. The first stage uses the Fuzzy Delphi questionnaire to screen out the inappropriate items. The second stage uses the Fuzzy Analytic Hierarchy Process (FAHP) questionnaire to calculate the weight and ranking of products. The results can be used as a reference to develop the country brand. The objects of the questionnaires were selected from various industries and that includes the government, academics and research field. And those experts with more than five years of work experience in this field were chosen. However, Dalkey (1969) mentioned that if there are more than 10 people in the Delphi method, the error degree will be reduced, the reliability is also enhanced. Therefore, 40 copies of these study questionnaires were distributed at each stage.

Fuzzy Theory
The Fuzzy Theory was proposed by Zadeh (1975). He proposed the concept of fuzzy sets, emphasizing fuzzy logic to describe the nature of things in real life. It uses a mathematical model to

describe the semantic fuzzy information. Fuzzy theory is a general designation of fuzzy set, fuzzy relation, fuzzy logic, fuzzy control and fuzzy measure (Lin, 1998).

Triangular fuzzy numbers

The common fuzzy number has two types, "Triangular Fuzzy Numbers" and "Flat or Trapezoidal Fuzzy Numbers". Because Triangular Fuzzy Numbers are more straightforward in the calculation, therefore they are also widely used. The following will introduce this method.
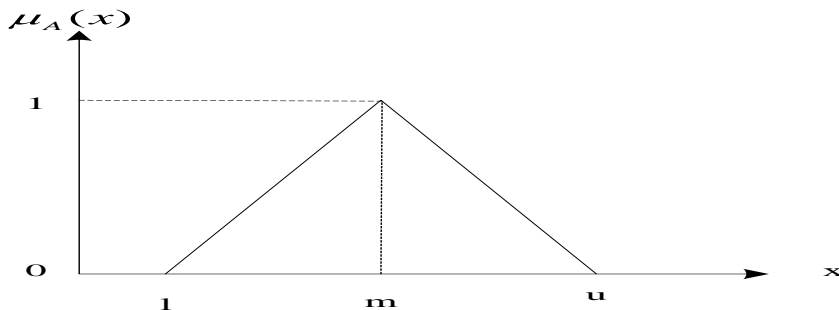

Figure 2: Triangular function

The Triangular Fuzzy Number is signified as $A=(l,m,u)$. When $l \leqq m \leqq u$ is greater than 0, then A is a positive triangular fuzzy number. This study adopted the Triangular Fuzzy Numbers method, which is simple to calculate. The triangular fuzzy number function can be calculated as follows:

$$\mu_A(x)= \begin{cases} 0 & , if\ x<1 \\ (x-l)/(m-l) & , if\ l \leqq x<m \\ 1 & , if\ x=m \\ (u-x)/(u-m) & , if\ m \leqq x<u \\ 0 & , if\ x>u \end{cases}$$

Defuzzification

Defuzzification is the process wherein the fuzzy number is converted into a clear value. The center of gravity method is always the popular method. The formula of defuzzification is shown below:

(Chiu and Weng, 2004)
$$F_i=[(u_i-l_i)+(m_i-l_i)]/3+l_i$$

Fuzzy linguistics

Zadeh (1975) proposed the concept of linguistic variables. In a situation that is complex and difficult to define, it is difficult to reasonably quantify the expression using the traditional way. Using the linguistic variables perspective is necessary to make a judgment. Chen and Hwang (1992) published the fuzzy linguistic scale, proposing a simple and easy-to-use approach for decision-makers (Table 1).

Table 1: Triangular fuzzy numbers

Linguistic scale	Triangular Fuzzy Numbers
Very unimportant	(0,0,1/4)
Unimportant	(0,1/4,2/4)
Ordinary	(1/4,2/4,3/4)
Important	(2/4,3/4,1)
Very important	(3/4,1,1)

Fuzzy delphi

Delphi
The Delphi method was proposed by Dalkey and Helmer (1963). It is a system procedural method that can express the opinions of the expert groups. The Delphi method is based on expert judgment and captured the advantages of both questionnaire and meetings. It is developed to a subjective prediction method (You, 1996). The traditional Delphi method often spent much time and cost in the process of repeat collection and integration of experts' opinions. Sometimes the low questionnaire response rate will affect the quality of judgment, and even possibly distort the original intent of experts. Therefore, the Delphi method still has some weaknesses (Linstone and Turoff, 1975; Hwang and Lin, 1987).

Fuzzy Delphi
Murray *et al.* (1985) first combined Fuzzy Set in the Delphi method. Ishikawa *et al.* (1993) used the fuzzy concept, and integrated the opinions of expert into the fuzzy numbers, is called the Fuzzy Delphi Method (FDM). The Fuzzy Delphi Method can be used as an evaluation criteria screening tool. It has the following advantages over the traditional Delphi method: (1) reduces the number of investigation times; (2) provides a more complete expression of the experts' opinions; (3) through the application of the fuzzy theory, the knowledge of experts will be able to meet the demand more; (4) it has more benefits in terms of time and cost. Generally the Fuzzy Delphi Method (FDM) is carried out in the following three steps: (1) establish the evaluation factors set; (2) collect experts' or decision group's opinions; (3) calculate the appraised value of the Fuzzy Delphi Method. The "gray zone testing method" is more effective in examining whether to render uniform convergence among the "double triangle fuzzy numbers" to integrate expert opinions (Wei and Zhang, 2005). We collected the initial assessment value for the indexes via experts' questionnaire, and integrated the fuzzy weight of experts as assessed by using the Fuzzy Delphi Method. That can calculate the importance of each criterion. w_{jk} is the assessment value of the k_{th} criteria by the j_{th} expert. And w_k is fuzzy weight value of the k-th original criteria.

$$w_{jk}=(l_{jk,}\, m_{jk,}\, u_{jk}),i=1,2,3...n \tag{1}$$

$$l_k=min\{l_{jk}\}_j,\, m_k=(\Sigma^n_{j=1}\, m_{jk})/n,\, u_{jk=}\, max\{\, u_{jk}\,\} \tag{2}$$

It uses a simple gravity method to screen assessment indicators. The original criteria fuzzy weight w_k is converted into a single value S_k. And we also set the threshold t. Then it filters out the appropriate assessment criteria from a number of assessment criteria. The selection principles are: suppose $S_k \geqq t$ is the accepted guidelines for the *p-th* initial evaluation criteria; otherwise, the indicator should be deleted. It is calculated as follows:

$$S_k=[\,(u_k\text{-}\,l_k)+(m_k\text{-}\,l_k)]/3 + l_k \tag{3}$$

FAHP

AHP
The Analytic Hierarchy Process (AHP) is a popular decision-making method and developed by Saaty (1980). It has been used in the socio-economic planning and management science field which is mainly used in uncertainty and with multiple evaluation criteria decision problems. It is especially suitable for qualitative assessment of the information. This method can help decision makers to make complex problems into a hierarchy structure by the system method. It can help decision makers to understand and reduce the risk of making a wrong decision by quantitative judgments. The steps involved in the method are described below: (Deng and Zeng, 1989).

1. Definition of decision problems.
2. According to the field and complexity of decision problems, invite some experts to be part of the

decision-making groups.
3. Establish the hierarchy structure.
4. Design the questionnaire, survey and establish pairwise comparison matrices.
5. Calculate the eigenvalue, eigenvector.
6. Test the consistency.
7. Integrate the experts' opinions.
8. Make the optimal plan or program decisions.

FAHP
The Fuzzy AHP was proposed by Buckley (1985), it makes the Saaty's AHP paired comparison value to be fuzzy. The fuzzy set theory is combined with the Analytic Hierarchy Process. In this study, we use FAHP to establish the assessment model. According to the hierarchical structure, this study uses the concept of AHP established pairwise comparison matrices by the various elements of pairwise compared with each other. Because respondents' subjective judgment is ambiguous, this study uses the semantic description method and the triangular fuzzy numbers to express the semantics of each criterion. That can be expressed more accurately by the respondents who would like to assess the value of subjective judgments. This study adopted the assessment of the1-9 scale which is proposed by Satty (1986). The fuzzy linguistic presented the fuzzy numbers as shown in Table 2.

Table 2: The linguistic scale between two factors of comparison

Semantic wording	Triangular Fuzzy Numbers
Equal	$\tilde{1} = (1,1,1)$
Inter value	$\tilde{2} = (1,2,3)$
Slightly important	$\tilde{3} = (2,3,4)$
Inter value	$\tilde{4} = (3,4,5)$
Important	$\tilde{5} = (4,5,6)$
Inter value	$\tilde{6} = (5,6,7)$
Very important	$\tilde{7} = (6,7,8)$
Inter value	$\tilde{8} = (7,8,9)$
Critically important	$\tilde{9} = (8,9,10)$

RESULTS

Survey objects
The questionnaire was distributed in two stages, the work of objects including those in various industries, government, academia, research. And the experts of a two-stage survey object are the same. All of the experts in various fields have more than five years of work experience. The following is the description of objects distribution. Because the products are divided into six categories, there are 4 to 5 copies in each category. We obtained a total of 25 copies from the industrial experts. And there are 4 to 6 copies from the experts who are working in the fields of government, academia and research, providing us with a total of 15 copies (Table 3).

Table 3: The research framework and fuzzy delphi results

Categories	Items	Fuzzy weights			Values
		l	M	U	
A. Agricultural products and food	a1. Rice	1	3.95	5	3.3167
	a2. Tea	2	4.275	5	3.7583
	a3. Fruits and vegetables	1	3.975	5	3.3250
	a4. Flowers	1	4	5	3.3333

	a5. Snacks	1	3.7	5	3.2333
	a6. Wine	1	3.3	5	3.1000
	a7. Fisheries	1	3.425	5	3.1417
	a8. Candies and cookies	1	2.675	5	2.8917 *
B. Communications products	b1.Smartphone	2	4.525	5	3.8417
	b2.GPS	2	4.15	5	3.7167
	b3. Wireless equipment	1	4.075	5	3.3583
	b4. Consumer Products	1	3.975	5	3.3250
	b5. Electronic reader	1	3.7	5	3.2333
	b6. Optical communication	2	4.05	5	3.6833
C. Information products	c1. Notebook	2	4.5	5	3.8333
	c2. Software (antivirus, games)	2	4.175	5	3.7250
	c3. LCD Monitor	1	4.05	5	3.3500
	c4. Tablet	2	4.15	5	3.7167
	c5. Pico projector	1	3.85	5	3.2833
	c6. DRAM	1	3.875	5	3.2917
	c7. Motherboard	1	4.075	5	3.3583
D. Emerging industry	d1. Electric cars	2	4.2	5	3.7333
	d2. Solar products	2	4.325	5	3.7750
	d3. Hydrogen and Fuel Cell	1	4.125	5	3.3750
	d4. Medicine and health food	1	4	5	3.3333
	d5. Nanotechnology Products	2	4.2	5	3.7333
	d6. Green Building	2	4.05	5	3.6833
	d7. Green energy	2	4.35	5	3.7833
E. Semiconductor industry	e1. IC packaging and testing	2	3.975	5	3.6583
	e2. IC mask	1	3.9	5	3.3000
	e3. IC design	1	4.4	5	3.4667
	e4. IC Manufacturing	1	4.175	5	3.3917
	e5. Emitting diode	1	4	5	3.3333
	e6. Foundry	1	4.2	5	3.4000
	e7. Semiconductor laser sensor	2	4.1	5	3.7000
F. Traditional industries	f1. Textiles	1	3.975	5	3.3250
	f2. Bike	1	4.275	5	3.4250
	f3. Glass products	1	3.725	5	3.2417
	f4. Fitness equipment	1	3.425	5	3.1417
	f5. Automotive	1	3.675	5	3.2250
	f6. Metallic chemical products	1	3.475	5	3.1583
	f7. Golf	1	3.425	5	3.1417

Note: *means the value below the threshold
Therefore, in total, we got 40 copies of valid questionnaires based on the Fuzzy Delphi method, and also obtained 40 copies of FAHP.

Results of fuzzy delphi
This study proposed the preliminary assessment framework of Taiwan's export products through the compilation of lectures and data. We obtained the initial value through expert Delphi questionnaire. And we integrated 40 experts' opinions, and calculated the triangular fuzzy numbers of each items. Then they are converted to a single value for each item. It is easy to do the final selection. And based on a lot of literature (Zhang, 1998), the value of the threshold will affect the

number of evaluation items. Most researchers using the Fuzzy Delphi Method usually set the threshold from 6.0 to 7.0 in the evaluation range which is from 0 to 10. But the evaluation range of this study is 0 to 5, so the threshold is set at 3.0. It is reasonable. The results found that only item (a8) candies and cookies, is less than the threshold value, as shown in Table 3. After the Fuzzy Delphi Method screening, the results were divided into six categories, 41 items. Then we used the results to establish a new hierarchical structure for the framework of the FAHP method.

Consistency test

In this stage we analyzed the importance of the evaluation items with pair-wise comparison questionnaire and the use of the Fuzzy Analytic Hierarchy Process (FAHP). There are a total of 40 questionnaires. Then we checked the effectiveness of every questionnaire by using a consistency test. Satty (1980) pointed out that the consistency index (CI) and the consistency ratio (CR) should be less than 0.1, if the CI value of the CR value is lower, which means a higher degree of consistency. In this study, all of the categories and items of every questionnaire meet the requirements of the consistency test.

The weights of export products

This study adopted the proposal of Buckley (1985) which is the Fuzzy Analytic Hierarchy Process (FAHP) to calculate the data by fuzzy pairwise comparisons. We obtained the weights of each category and item. Then we did more analysis via these weight results.

The weights and ranking of categories

Based on the data obtained from the experts' questionnaire response, we calculate the geometric mean, fuzzy weights, inverse trigonometric solutions of fuzzy numbers, normalized weights and weight rankings of all categories. The results are shown in Table 4.

Table 4: The weights and ranking of categories

Categories	Geometric mean			Fuzzy weight			Defuzzification	Weight	Rank
	(*l*	*M*	*u*)	(*l*	*m*	*u*)			
Agricultural products and food	0.46	0.53	0.6	0.06	0.08	0.11	0.0824	0.0806	6
Communications products	1.06	1.2	1.37	0.14	0.18	0.24	0.1879	0.1836	4
Information products	1.28	1.47	1.66	0.17	0.22	0.29	0.2286	0.2233	1
Emerging industry	1.19	1.37	1.57	0.16	0.21	0.27	0.2141	0.2092	3
Semiconductor industry	1.26	1.44	1.64	0.17	0.22	0.29	0.225	0.2198	2
Traditional industries	0.48	0.54	0.63	0.06	0.08	0.11	0.0855	0.0836	5

The weights and ranking of all items

The first step involved calculating the weights of all categories. The next steps include calculating the items' weights in each category. Then the overall items' weights are sorted and ranked. The results are shown in Table 5. Figure 4 is a line chart, which is plotted based on the sorted weights. There are two common methods to decide the number of important items. One is subjective, decided by the decision maker. The number usually is 5 to 7. It is relatively simple and the most commonly used. Another method is to find the steep point. This allows you to filter out the desired items. In this case, it can be found that it falls around the third and sixth point.

Tale 5: The weights and ranking of Taiwan's export products

Items	Weights	Rank
e3. IC design	0.05844	1
b1. Smartphone	0.04767	2
d5. Nanotechnology Products	0.04009	3
c1. Notebook	0.04008	4
d7. Green energy	0.03972	5

c2. Software (antivirus, games)	0.03636	6
e7. Semiconductor laser sensor	0.03398	7
c4. Tablet	0.03347	8
e6. Foundry	0.03311	9
c5. Pico projector	0.03234	10
d4. Medicine and health food	0.03166	11
b3. Wireless equipment	0.03137	12
d6. Green Building	0.03055	13
e4. IC Manufacturing	0.0304	14
b2. GPS	0.02963	15
c7. Motherboard	0.02843	16
c6. DRAM	0.02809	17
e5. Emitting diode	0.02792	18
b6. Optical communication equipment	0.02743	19
d3. Hydrogen and Fuel Cell	0.02607	20
c3. LCD Monitor	0.02457	21
b4. Consumer Products	0.02387	22
b5. Electronic reader	0.02362	23
d2. Solar products	0.02338	24
f5. Automotive	0.02011	25
e2. IC mask	0.01984	26
d1. Electric cars	0.01769	27
f2. Bike	0.0169	28
e1. IC packaging and testing	0.01612	29
a2. Tea	0.0151	30
a4. Flowers	0.013	31
a3. Fruits and vegetables	0.0125	32
a5. Snacks	0.01158	33
f6. Metallic chemical products	0.01142	34
a1. Rice	0.01136	35
f1. Textiles	0.00977	36
f7. Golf	0.00889	37
a7. Fisheries	0.0087	38
f4. Fitness equipment	0.00844	39
a6. Wine	0.00831	40
f3. Glass products	0.00801	41

This study decided to adopt 6 items. So the more important items are IC design, smart phone, nanotechnology product, notebook, green energy and software (antivirus, games).
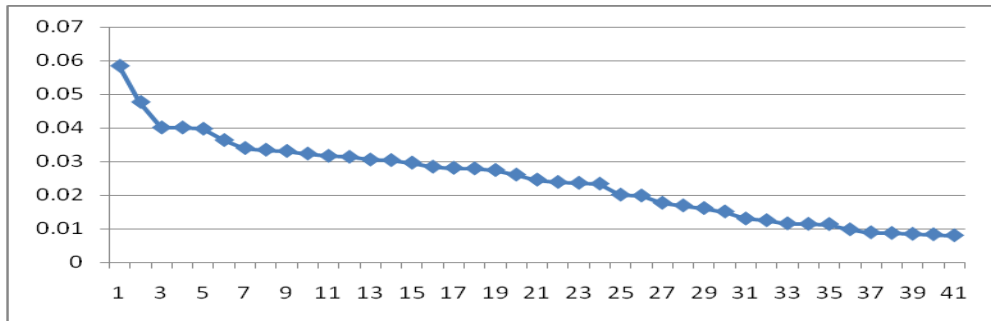
Figure 4: Wieght line chart

DISCUSSIONS

International trade is an important activity for Taiwan's economic development. This study used this feature to find the optimum products which can represent Taiwan and that can serve as the basis to build the Taiwan brand. This study used the two-step analysis method. The first stage uses the Fuzzy Delphi Method to evaluate the research framework. The second stage uses the Fuzzy AHP to weigh all the items. The important categories are "Information products", "Semiconductor industry" and "Emerging industry". The results show that the technology industries are suitable to serve as the foundation of the nation's brand development. Then we analyze the items' weight ranking based on the categories. We listed the top three items of every category: (A) agricultural products and food: tea, flowers, fruits and vegetables; (B) communications Products: smartphone, wireless communications equipment, GPS; (C) information products: notebook, software (antivirus, games), tablet PC; (D) emerging industries: nanotechnology products, green energy, medicine and health food; (E) semiconductor industry: IC design, photosensitive semiconductor laser element (CMOS), foundry; (F) traditional industries: automotive, bikes, metal chemical products.

Finally we calculated the weights of the overall assessment items. Then we sorted the weight of each item in order to rank them. And they are plotted as a line chart. It can be seen clearly that the six important items are IC design, smartphone, nanotechnology products, notebooks, green energy and software (antivirus, games). They are shown in Table 5 and Figure 4. The results expressed both technology and environmental protection as getting the most attention. This situation is also in line with the status of Taiwan's industries. In the ranking of all the products, the first is IC design. The output value of the Taiwan IC design industry is just below that of the United States globally. According to the report of the Taiwan Market Intelligence & Consulting Institute (MIC), the IC design industry's output value is about $ 13.5 billion in 2011. That means that Taiwan's IC design industry has high potentials for development. And there are five Taiwanese companies in the top 20 IC designs globally. MediaTek is ranked fifth in the world. So the experts and scholars consider IC design as the most representative of Taiwan. The second item is the smartphone being the most representative product of Taiwan in recent years. The data of IDC (International Data Corp.) pointed out the smartphone market share has more than 60 percent in Taiwan. Therefore, the experts of this study have an optimistic view of the development of Taiwan's smartphone industry.

The third item is nanotechnology products. The Nano National Science and Technology Program Office was established in 2002 in Taiwan. The Taiwanese government promoted the Nanotechnology National Science and Technology Program, whose aim is to integrate Taiwan's nanotechnology-related human and technical resources. It looks forward to establishing Taiwan's knowledge-based economy through the development of nanotechnology. It hopes to further create Taiwan's competitive advantage in the next generation industry. The number of nanotechnology patents in Taiwan in the past twenty years has been on the rise. The Pilot Program NNI in the U.S. announced 22,608 nanotechnology patents in 2007. Taiwan has 382 patents. Taiwan is ranked sixth

in the world. Taiwan has intellectual superiority so Taiwan should find some suitable international partners to create excellent products. Many products of Taiwan have the ability to help developing nation brand. However, this task needs huge human resource, money and a lot of time. Therefore, the government should set up a dedicated organization to push the task.

CONCLUDING REMARKS

Based on the results, it shows that Taiwan's high-tech products are renowned globally, so this study tends to take Taiwan's technological industry as the basis for the development of nation branding. Several suggestions are proposed by this study. Since Taiwan is rich enough and has strength in its export products, international trade can become more powerful. Why not have some actual support measures or policies as the driving force to further develop the export industry? Korean dramas, the New Zealand kiwi fruit, etc. are all under the support of their government. They gradually developed with the help of various support measures and policies. The Taiwanese government should actively think of such endeavors. This should be the direction of any efforts by the Taiwanese government. The image of Taiwan as a country is being marketed by several different units currently. The Taiwan Tourism Bureau is responsible for tourism image, TAITRA (Taiwan External Trade Development Council) is responsible for product image, MOEA (Ministry of Economic Affairs) is responsible for the investment image. Therefore, this study suggests that the government should set up a special unit, which can integrate the domestic resources and a variety of opinions, something which can operate the nation branding strategy in different fields from an overall perspective. This can avoid conflicts in presenting the image because of different units being responsible for different aspects of the image. Doing nation branding requires huge resources and a considerable amount of time. It has a very large impact on the country. The government can consider establishing a high level specialized unit in order to create the long-term positive benefits of nation branding.

The scope of nation branding is very broad. But there are a few relevant studies. This study is only a preliminary research. Therefore the research framework may be insufficient. The following study can propose different perspectives to explore more about this issue and the subsequent researches can further explore the practical strategies that can form a more comprehensive research about the nation branding issue. The following researchers can also study the success stories of the other countries in order to provide suggestions to Taiwan. Then the content would be an important reference for the government to plan the strategy of how to go about nation branding.

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