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# Key success factors of international market development

Key success factors

## An empirical study of the Taiwan bulk shipping industry

79

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### Abstract

**Purpose** – The purpose of this paper is to develop an evaluation model to determine the relative weights of key factors influencing international market development (IMD) success through analysis network process (ANP) during group decision-making. An empirical case of the Taiwan bulk shipping industry is used to illustrate the feasibility of the proposed approach.

**Design/methodology/approach** – The literature review is performed to generate 20 key success factors (KSFs) along with four factor categories in IMD (such as organizational capability, environmental scanning, international strategy and internationalization behavior). Then, ANP is applied to develop an evaluation model that prioritizes the relative importance linking the above four factor categories with 20 evaluated KSFs.

**Findings** – With respect to the final weights for factor categories, “international strategy” and “environmental scanning” are the two most important criteria, followed by “organizational capability” and “internationalization behavior”. The results also showed that by reviewing the global weights of the 20 KSFs of IMD, “service as competitive advantage”, “market potential” and “risk taking” have the highest rankings.

**Practical implications** – The findings indicate that firm expansion into international markets typically depends on a successful international strategy. Hence, to enhance their global market competitiveness, Taiwan bulk shipping firms should focus their efforts on planning international market entry strategy and prioritizing shipping services with high-potential target markets.

**Originality/value** – Theoretically, the study results can provide both theoretical basis and empirical evidence, indicating the relative weights and priorities of KSFs of IMD for the Taiwan bulk shipping industry. From the managerial perspective, the analytical results can help managers focus on main factors and identify the best policy to improve their IMD practice and performance.

**Keywords** Key success factors, Analysis network process, Bulk shipping industry, International market development

**Paper type** Research paper

### Introduction

In developing and emerging economies, international market development (IMD) has been considered one of the most important strategies through which a firm can expand its market and sustain a competitive advantage (Asika, 2006). By definition, IMD refers to the process of increasing involvement in international operations (Welch and Luostarinen, 1988). More practically, IMD involves a process by which a firm focuses on current and future needs in the international market, competition in international markets and other exogenous factors that influence its international performance (Cadogan *et al.*, 2001). Firms undertake IMD for various reasons, including improved responsiveness to international customers (Ripolles *et al.*, 2012), superior learning or international experience effects (Ekeledo and Sivakumar,



2004), access to resources that are cheaper or more abundant in foreign countries (such as labor, technology or specific competencies in a particular country) (Doz *et al.*, 2001) and enhanced capacity for global monitoring of competitors, markets and other profit opportunities (Contractor *et al.*, 2003). However, IMD is a difficult task for many firms because they must adapt to unfamiliar locations and integrate new foreign subsidiaries into their existing operational processes (Meyer *et al.*, 2011). Consequently, researchers such as Gunhan and Arditi (2005) and Chen and Wang (2010) have recognized the need to extend existing research on IMD to understand key factors that may be important in facilitating IMD success.

Maritime shipping involves complexity and uncertainty, and it is a crucial industry in facilitating international trade and global economic development (Chen and Wang, 2004; Lun *et al.*, 2011; Blonigen and Wilson, 2013). Bulk shipping business is one of the two main sub-sectors (bulk shipping and liner shipping) within maritime transportation, and involves carrying dry cargoes by bulk vessels on irregular scheduled lines (Lun *et al.*, 2010; Veenstra and Franses, 1997). Bulk shipping is generally classified as either major or minor (Marlow and Gardner, 1980). Major bulk cargo includes coal, iron ore and grain, whereas minor bulk cargo includes agricultural products, minerals, cement, forest products, steel products, etc. The transportation of such goods is essential to economic activity, and the bulk shipping plays a significant role in the global trade and economic. However, the bulk shipping industry is a perfect competition market, so price levels (i.e. freight rates) are volatile while the terms and conditions of carriage are negotiated between shippers and carriers through shipbrokers (Lun *et al.*, 2010). In the bulk shipping context, the Baltic Dry Index is an index of the freight rates which are influenced by the market (i.e. demand for shipping services and supply of shipping services), as well as the characteristics of market structure, such as the number of shipping firms, the cost of shipping operations and the level of international expansion. Accordingly, IMD is an important ingredient for bulk shipping firms because expanding their international scope is essential to meet customer needs and provide the long-term benefits of international marketing.

Taiwan is an island-based economic center in the middle of the Asia Pacific Region. It is a major maritime economy with a significant global network, and its prosperity is highly dependent on foreign trade. Taiwan's bulk fleet capacity has been steadily growing in recent years, and its international status is gradually improving. Taiwan's bulk fleet consisted of 262 ships (12.22 per cent of Taiwan-owned vessels were registered in Taiwan, while 87.78 per cent flew a foreign flag) with a total capacity of 19.54 million deadweight tonnages and control capacity ranks sixth in the world (Institute of Shipping Economics and Logistics, 2013). To accelerate the liberalization and internationalization of the Taiwan shipping industry, Taiwan bulk shipping firms must strive to facilitate international expansion and boost their market shares in a highly competitive global environment (Chiu, 2007). IMD enables firms to deploy their internal resources and capabilities in international markets, and also reduces transportation costs, liberalizes global trade and promotes the cross-border transfer of bulk shipping know-how, managerial skills and marketing experience (Clarke and Rimmer, 1997; Alizadeh and Nomikos, 2010). Based on the above background information and with reference to the relevant literature, it is worth investigating IMD issues in the Taiwan bulk shipping industry and identifying their key success factors (KSFs).

When an organization expands into international markets, identifying the KSFs of IMD will be an important issue. Indeed, many key factors are related to IMD success (such as organizational capability, environmental scanning, international strategy and internationalization behavior) and interact with complex relationships (Eid *et al.*, 2002; Maharajh and Heitmeyer, 2005; Rundh, 2007; Cheng *et al.*, 2011; Suh and Kim, 2014). That is,

the evaluation of KSFs of IMD is a multi-criteria decision-making problem since managers may consider multiple factors or criteria in making such assessments. Different methods can be applied to solve multi-criteria decision-making problems, such as analytic hierarchy process (AHP) and analysis network process (ANP) (Saaty, 1996a). AHP is applied to solve the decision-making problem by modeling in a hierarchy, while ANP is used when interdependent relationships exist among decision criteria that cannot be modeled as a hierarchy. Since KSFs related to IMD may exert a mutual influence (for example, improving in organizational capability affects the internationalization behavior), this study used ANP to determine the relative weights of KSFs of IMD.

In this study, the aim is to develop an evaluation model to determine the relative weights of key factors influencing IMD success through ANP during group decision-making. Also, an empirical case of the Taiwan bulk shipping industry is used to illustrate the feasibility of the proposed approach. The study results can provide both theoretical basis and empirical evidence indicating the relative weights and priorities of KSFs of IMD for the Taiwan bulk shipping industry. From the managerial perspective, the analytical results can help managers focus on main factors and identify the best policy to improve their IMD practice and performance. An identification of the relative importance of these factors can help facilitate IMD success and realize global market competitiveness.

### Identification of factor categories and KSFs in IMD

The literature review is mainly aimed at identifying the factor categories and KSFs in IMD. A full review and evaluation of key influences on IMD success in the literature was conducted: 20 KSFs along with four factor categories (including organizational capability, environmental scanning, international strategy and internationalization behavior). Table I shows the relationships between the factor categories and KSFs in IMD.

#### *Organizational capability*

Organizational capability comprises the firm's ability to effectively manage resources, such as employees, financial, information technology (IT) and marketing resources, to gain competitive advantage (Tece and Pisano, 1994). Firms must possess organizational capabilities that support both early internationalization and subsequent success in international markets because they provide a stable basis for IMD (Knight and Cavusgil, 2004). There are five factors in this category.

First, top management support is essential not only in setting strategic internationalization objectives (Eid *et al.*, 2002; Suh and Kim, 2014), but also in motivating and encouraging employees to successfully develop international markets (Hutzschenreuter and Horstkotte, 2013). Maharajh and Heitmeyer (2005) cited that senior management must commit sufficient resources to support international expansion.

Second, lack of financial support is often the greatest barrier to business expansion (Mishina *et al.*, 2004). Financial resources are necessary for a firm to develop international markets because they ensure the financial support used to build the capabilities needed for international market expansion (Gunhan and Arditi, 2005).

Third, according to Masrek and Jusoff (2009), IT infrastructures comprise a set of IT resources (including hardware, software, databases and telecommunications) that enable IT application development and business process support. Scholars have examined that IT infrastructures have a significant effect on the degree of internationalization (Eid *et al.*, 2002; Yang and Lee, 2002; Gunhan and Arditi, 2005).

Fourth, while individual sales staff may possess general sales and marketing skills, individual sales teams are unique. Sales teams with substantial international experience are more likely to possess deeper knowledge of foreign environments and cultures (Doherty,



2007; Brouthers *et al.*, 2009). Sales team quality, specifically the ability to solve international marketing related problems, is central to promoting internationalization efforts and thus the ultimate success of international expansion (Eid *et al.*, 2002; Rundh, 2007).

Finally, business expansion comprises the firm ability to engage in new markets, new technologies, novel products or services and having the potential to compete in international markets (Osch, 2013). Firm ability to create new markets (such as the increasing importance of niche markets and the emergence of global networks) has also influenced the current internationalization phenomenon (Gunhan and Ardit, 2005; Suh and Kim, 2014).

### *Environmental scanning*

International trading activities involve many interactions with customers or external environments: understanding customer requirements and responding to environmental change is important (Darling and Seristo, 2004; Maharajh and Heitmeyer, 2005). In this study, environmental scanning is defined as a management process adopted by organizations to acquire external information, like customer expectations, market trends and government regulations which can help to internationalize decision-making (Zhang *et al.*, 2010). There are five factors in this category.

First, firms are increasingly focused on building and maintaining positive buyer–seller relationships, which create the experiential knowledge required to develop international markets (Gunhan and Ardit, 2005; Suh and Kim, 2014). Firms with excellent skills in creating customer relationships, and that are deployed to achieve closely managed (personal, interactive, trusting and long term) partnerships with foreign customers, are more likely to realize international success (Harris and Wheeler, 2005).

Second, profitable firms cater to customer needs better than the competition and are more likely able to sustain competitive advantages over time (Plomaritou, 2007). Setting internationalization targets begins with identifying customer needs, which involves solving customer problems, making transaction decisions and making and implementing plans (Brouthers *et al.*, 2009; Darling and Seristo, 2004).

Third, customer support is an appropriate first step toward developing international markets (Eid *et al.*, 2002). Ultimately, internationalization depends on excellent customer support expressed through positive word of mouth and feedback (Morschett, 2006; London, 2010).

Fourth, survival depends on firm's ability to satisfy its customers, which involves the collection of market information on customer satisfaction (Christensen and Bower, 1996). Through continuous improvement and enhancement of customer satisfaction, firms can expand their international business and succeed in new markets (Yang and Lee, 2002; Suh and Kim, 2014).

Finally, general host country uncertainties (including political and government policy instability) can either impede or enable IMD success (Maharajh and Heitmeyer, 2005; Cheng *et al.*, 2011). Firms are significantly influenced by government regulations that directly limit market access, treat investments unfairly or subsidize domestic competitors. Simultaneously, firms developing international markets face incentives or restrictions under host-country government regulations, including regulations on international promotion of certain regions as investment destinations, tax laws and economic sanctions.

### *International strategy*

International strategy describes a firm plan to enter different foreign markets (Phillips *et al.*, 1994). International strategy aims to expand business operations on the worldwide level, and enables the entry of firm services, technology, human skills, management or other resources into the foreign country (Horstman and Markusen, 1996). Previous studies have identified

several determinants of the choice of international market entry strategies (Rundh, 2007). There are five factors in this category.

First, generally, provision of high-quality customer services is a core competency that is integral to expansion into international markets, particularly in the service industry (Gunhan and Arditi, 2005; Rundh, 2007). Morschett (2006) also emphasizes that focus on high-quality service can help a firm improve its competitive position, market share and profits in the context of internationalization.

Second, cost-efficiency occurs when a firm is able to utilize its skilled workforce, control over costs and provide efficient operations to maximize customer value. Firms with greater ability to improve their cost-efficiency, especially through reducing labor costs and enhancing operational efficiencies, are more likely to succeed at international expansion (Morschett, 2006; Rundh, 2007).

Third, geographic proximity of the home country and the host country is a driving factor since proximate markets are more likely to be integrated than distant markets (Zhang and Yuk, 1998). Geographic proximity tends to reinforce trust, reduce collaboration costs and enhance the formation of inter-organizational networks, and thus increases motivation to participate in international collaboration (Rundh, 2007; Brouthers *et al.*, 2009).

Fourth, countries with high market potential (size and growth) can attract foreign firms because they offer greater potential for growth, profit and operational stability (Yang and Lee, 2002). Thus, when firms enter high-potential international markets, they may have higher opportunities to realize profitable growth and success (Doherty, 2007).

Finally, service differentiation (such as delivering high-quality service to customers or providing value-added service to customers) is an important concept in the context of growth and international trade (Maharajh and Heitmeyer, 2005). A service differentiation strategy enables firms to be aggressive in competitive foreign markets, and thus, allows competitive advantages to be realized (Rundh, 2007).

#### *Internationalization behavior*

Internationalization behavior is defined as the process through which firms gradually become involved in international markets and initiate contact with international operations (Ellis and Pecotich, 1998). Internationalization behavior provides firms with market opportunities that help them learn from international markets and realize international business performance (Brouthers and Hennart, 2007). There are five factors in this category.

First, strategic alliances refer to cooperative efforts in which two or more organizations, while maintaining their own corporate identities, cooperate to share reciprocal benefits (Vanhaverbeke *et al.*, 2002). Given the increasing importance of strategic alliances to enterprises, it is crucial to begin exploring whether and how partnering strategies influence IMD (Lu and Beamish, 2006). Strategic alliances also have been suggested as an important means of overcoming deficiencies in resources and capabilities and thus enhancing the likelihood of IMD success (Gunhan and Arditi, 2005; Suh and Kim, 2014).

Second, firms normally face particularly difficult decisions when planning the optimal time to develop international markets (Luo and Peng, 1998). When examining the determinants of internationalization behavior, timing is a crucial consideration (Suh and Kim, 2014). Hence, timing of internationalization significantly determines the success of IMD.

Third, overseas networks and contacts are essential to successful international operations (Gunhan and Arditi, 2005). Due to third-country partners (e.g. suppliers, customers, financial organizations and industry or commerce associations) potentially having specific knowledge on the host country, firms tend to derive valuable host country

information through social ties to partner firms operating in international markets (London, 2010).

Fourth, risk-taking refers to firm's ability and willingness to identify challenges and take on business risk (Naman and Slevin, 1993). This means that firms facing environmental uncertainty need to understand and take potential risks when entering international markets (Brouthers *et al.*, 2009; London, 2010). Hence, in competitive environments such as international markets, risk-taking initiatives are required to realize successful internationalization.

Finally, internationalization behavior can be seen as a process of incremental learning through accumulating international experience over time (Ekeledo and Sivakumar, 2004). To integrate with international markets, firms need to learn from international experiences and apply their knowledge to improve decision-making and facilitate IMD success (Zhao *et al.*, 2004; Morschett, 2006).

### The proposed methodology

#### *Essences of analytic network process*

ANP is a comprehensive multi-criteria decision-making approach developed by Saaty (1996a) as an extension to the AHP. For example, in the AHP, interactions and dependencies can start from the upper levels through lower levels. However, in the ANP, all of the elements of network can interact with each other. AHP forms a network structure, interactions of which are solely linear and top-down. Two interdependent relationships (interactions) exist in an ANP: inner dependence and outer dependence. Inner dependence (loop) occurs when some elements of one cluster affect one another, while outer dependence occurs when the elements of a cluster affect those of the other cluster. That is, a unique feature of ANP is the consideration of interdependent relationships among elements that belong to same and/or different clusters as decision-making becomes increasingly complicated. Relationships in an ANP model are represented by the directions of arrows and arcs signify the dependence. The one-way arrows indicate the impact from one cluster to the other. Interdependency relationship among elements in different clusters (outer dependence) is represented by a two-way arrow and inner dependence among elements in the same cluster is represented by a looped arc (Saaty, 1996a; Sarkis, 2003).

Identifying the relative importance of KSFs of IMD can be viewed as a strategic decision with long-term organizational impacts. These KSFs have diverse significances and meanings; this study cannot assume each considered criteria to be equally important. Various key factors that affect IMD success are interrelated; when the level of a single factor is changed, other factors must simultaneously be considered. These interactions create a complex model whose factors include both inner and outer dependence, and the application of hierarchical analysis cannot solve the problem. Therefore, instead of using the commonly used AHP approach to assess key factors that affect IMD success, this study uses the ANP approach to determine the criteria weights, because it is a powerful tool for solving strategic decision-making problems, and allows for the integration of expert and evaluator opinions.

#### *Group decision-making in the ANP*

In the ANP, an aggregate pair-comparison matrix indicating the judgments of evaluators on the pair-comparisons should be calculated through group decision-making (Lin *et al.*, 2008; Sadeghi *et al.*, 2012). Assuming there are  $n$  number of criteria, denoted as  $(C_1, \dots, C_j, \dots, C_n)$ , its aggregate pair-comparison matrix would be  $A = (a_{ij})$ , in which  $a_{ij}$  represents the relative importance of  $C_i$  to  $C_j$ . Then using the row vector average normalization proposed by Saaty (1980), the approximate weight  $W_i$  of  $C_i$  is calculated as:



$$W_i = \frac{\left(\prod_{j=1}^n a'_{ij}\right)^{\frac{1}{n}}}{\sum_{i=1}^n \left(\prod_{j=1}^n a'_{ij}\right)^{\frac{1}{n}}} \quad i, j = 1, \dots, n \quad (1)$$

When some minor inconsistency arises in decision-making, the maximum eigenvalue  $\lambda_{\max}$  in equation (2) will not be equal to  $n$ . Thus, the equations (2) and (3) are used to obtain the approximate maximum eigenvalue  $\lambda_{\max}$ :

$$AW = \lambda W \quad (2)$$

$$\lambda_{\max} = \frac{1}{n} \sum_{i=1}^n \frac{(AW)_i}{W_i} \quad (3)$$

*Consistency test*

Saaty (1990) provided a consistency index (*CI*) that captures any inconsistency within judgments in each aggregate pair-comparison matrix as well as in the overall decision structure, as in the ANP. The *CI* is formulated as follows:

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad (4)$$

Then, consistency ration (*CR*) of the aggregate pair-wise comparison matrix needs to be calculated as in equation (5). For  $n$  from 1 to 10, the corresponding random index (*RI*) values are 0, 0, 0.58, 0.9, 1.12, 1.24, 1.32, 1.41, 1.45 and 1.49, respectively.

$$CR = \frac{CI}{RI} \quad (5)$$

If the calculated *CR* of the aggregate pair-wise comparison matrix is less than 0.1, the consistency of the pair-wise judgment can be thought of as being acceptable. However, if the consistency is not passed, the original values in the pair-wise comparison matrix must be revised by the evaluator.

*Limiting the weighted supermatrix for the weights*

ANP uses supermatrix to deal with inner and outer dependence relationships among the criteria. If no interdependent relationship exists among the criteria, the pair-wise comparison value would be 0. If an inner and outer dependence relationship exists among the criteria, then such value would longer be 0 and an un-weighted supermatrix will be obtained. The un-weighted supermatrix must be normalized and synthesized to make it stochastic (sum of the column amounts to 1) (Saaty, 1996b), and the result is known as the weighted supermatrix  $M$ . Next, through equation (6), the weighted supermatrix multiplies itself several times and then converges into a limit matrix ( $M^*$ ) with constant value to get the global criteria weights.

$$M^* = \lim_{k \rightarrow \infty} M^k \quad (6)$$

where  $k$  is an arbitrarily large number, allows convergence.

Once the weights of all criteria are obtained, weight of each dimension is equal to sum of its element's weight. Eventually, a ranking order can be generated based on the weighting scores.

### Empirical analysis

This study constructed the ANP model to evaluate KSFs of IMD for the Taiwan bulk shipping industry. Super Decision software package has been used for the ANP computations. The ANP model for evaluating the key factors that affect IMD success comprises the following steps:

#### *Step 1: Identify the evaluative criteria and establish the ANP model*

In this study, the ANP model has been developed on the basis of literature review which identifies and classifies the various criteria for evaluating KSFs of IMD for the Taiwan bulk shipping industry (Table I). Under organizational capability ( $C_1$ ), there are KSFs of top management support ( $C_{11}$ ), financial support ( $C_{12}$ ), IT infrastructures ( $C_{13}$ ), sales teams ( $C_{14}$ ) and business expansion ( $C_{15}$ ). Under environmental scanning ( $C_2$ ), there are customer relationships ( $C_{21}$ ), customer needs ( $C_{22}$ ), customer support ( $C_{23}$ ), customer satisfaction ( $C_{24}$ ) and government regulations ( $C_{25}$ ). Service as competitive advantage ( $C_{31}$ ), cost-efficiency ( $C_{32}$ ), geographical proximity ( $C_{33}$ ), market potential ( $C_{34}$ ) and service differentiation ( $C_{35}$ ) are the KSFs of international strategy ( $C_3$ ). Strategic alliances ( $C_{41}$ ), timing of internationalization ( $C_{42}$ ), overseas networks ( $C_{43}$ ), risk taking ( $C_{44}$ ) and international experience ( $C_{45}$ ) are KSFs of internationalization behavior ( $C_4$ ). Definitions of factor categories and KSFs in IMD are presented in Table II.

Then, six panelists (three faculty and three practitioners who have more than 10 years of related working experience in the fields of international marketing and marine transportation) have been consulted and conducted an input-output analysis to identify the inner and outer dependencies between sub-criteria in the same or different criteria. An input-output matrix (the entries or elements of which are zero or one) was designed. Number one symbolizes the existence of a direct relationship between two sub-criteria and zero showed that there is no impact. According to the results of input-output analysis, the aggregated pair-wise relationship matrix was designed as shown in Appendix 1. Figure 1 illustrates the proposed network after organizing their opinions and confirming the validity of the ANP model.

#### *Step 2: Data collection*

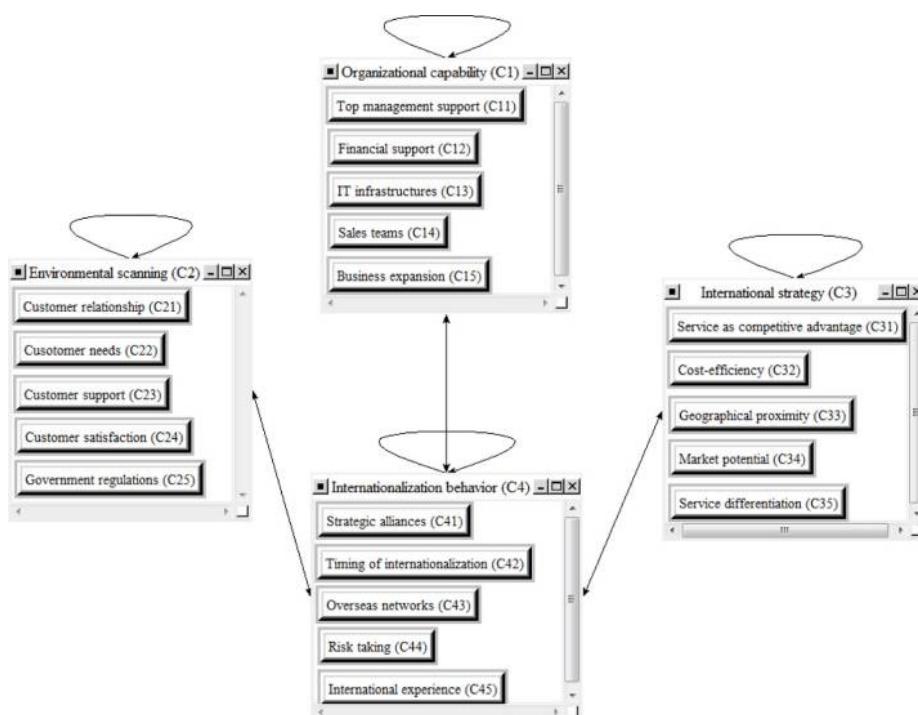
In this study, 11 bulk industry experts were invited as evaluators to assign pair-wise comparison judgments to determine the relative weights with respect to KSFs of IMD shown in the ANP model (see Figure 1). Furthermore, to focus the multi-criteria decision-making approach, it has been advised to engage a small group of participants (Saaty, 1986), as little as 10 participants are sufficient (Noble, 2004). All 11 experts had worked in the Taiwan bulk shipping industry, specifically in marketing and particularly international marketing, for between 5 and 18 years (the profile of the evaluators is given in Table III). Their positions ranged from managing director to marketing manager, controller and other senior personnel. They thus had sufficient knowledge and understanding of IMD practices in the Taiwan bulk shipping industry, and adequately represented the viewpoints and opinions of the Taiwan bulk shipping industry. That is, the experts were able to evaluate the criteria and sub-criteria and assign them relative importance in the ANP model.

Factor categories/KSFs in IMD	Definition
<i>Organizational capability (C<sub>1</sub>)</i>	
Top management support (C <sub>11</sub> )	Upper-level managers were personally involved in the international market development
Financial support (C <sub>12</sub> )	Adequate financial resources were invested in the international market development
IT infrastructures (C <sub>13</sub> )	Appropriate IT infrastructures were provided to develop international markets
Sales teams (C <sub>14</sub> )	High-performance sales teams were involved throughout the international market development
Business expansion (C <sub>15</sub> )	Our firm has the ability to create new markets for developing international markets
<i>Environmental scanning (C<sub>2</sub>)</i>	
Customer relationships (C <sub>21</sub> )	Our firm is willing to put more effort in building strong customer relationships for developing international markets
Customer needs (C <sub>22</sub> )	Our firm is aware of the importance of customer needs for developing international markets
Customer support (C <sub>23</sub> )	Our firm believes that customers continuously provide advice during the international market development
Customer satisfaction (C <sub>24</sub> )	Our firm believes that customers are satisfied with shipping services through the international market development
Government regulations (C <sub>25</sub> )	The development of international markets for our firm was driven by government regulations
<i>International strategy (C<sub>3</sub>)</i>	
Service as competitive advantage (C <sub>31</sub> )	Service quality is the most important competitive advantage for our firm in developing international markets
Cost-efficiency (C <sub>32</sub> )	Cost-efficiency is the most important competitive advantage for our firm in developing international markets
Geographical proximity (C <sub>33</sub> )	Geographical proximity is the most critical factor for our firm in developing international markets
Market potential (C <sub>34</sub> )	High market potential (size and growth) influences our firm to develop international markets
Service differentiation (C <sub>35</sub> )	Degree of service differentiation influences our firm to develop international markets
<i>Internationalization behavior (C<sub>4</sub>)</i>	
Strategic alliances (C <sub>41</sub> )	Strategic alliances are important mechanisms for our firms to develop international markets
Timing of internationalization (C <sub>42</sub> )	Time to enter the international market influences our firm to develop international markets
Overseas networks (C <sub>43</sub> )	Establishing overseas networks and contacts play an important role in the international market development
Risk taking (C <sub>44</sub> )	Our firm has the ability to solve the international risk and crisis for developing international markets
International experience (C <sub>45</sub> )	Our firm's experiences of internationalization urge us to expand internationally

**Table II.**  
Definitions of factor categories and KSFs in IMD

*Step 3: Calculate the priority weights of criteria and sub-criteria and obtain final ranking*

An ANP questionnaire format (nine-point rating scale) indicates the dependence relationships and interactions among KSFs of IMD. After 11 evaluators finished their assessments of relative importance among KSFs of IMD, the geometric mean was used to aggregate the pair-wise comparison matrix [equation (1)]. As an example, evaluators make



**Figure 1.**  
The ANP model to evaluate KSFs of IMD

Expert no.	Position	Years of experience
1	Managing director	10
2	Project manager	12
3	Senior marketing personnel	10
4	Marketing manager	9
5	Senior marketing personnel	5
6	Business controller	5
7	Marketing manager	11
8	Senior marketing personnel	5
9	Managing director	18
10	Business controller	10
11	Senior marketing personnel	8

**Table III.**  
Profile of evaluators

pair-wise comparisons among KSFs of IMD under organizational capability ( $C_1$ ) with respect to the strategic alliances ( $C_{41}$ ) under internationalization behavior ( $C_4$ ) (see Appendix 2 for an example of the ANP questionnaire).

The group judgment is the input of the Super Decision software. To ensure consistency among the judgments of participants, the  $CR$  value was calculated [equation (5)] for each dimension of the ANP model. The consistency test results confirmed that the  $CR$  values for the four factor categories were all below 0.1, indicating that the results of the evaluation process were consistent and reliable. The corresponding eigenvalues that were derived from

the pair-wise comparison matrices are entered into the unweighted supermatrix. Saaty (1996a) indicated that the supermatrix must satisfy the column stochastic principle that each column should sum to one. Thus, the weighted supermatrix for potential passengers ( $M$ ) (Table IV) is obtained by multiplying all elements in a component of the unweighted supermatrix by the corresponding cluster weight (Saaty, 2008). According to Saaty (2008), the limit supermatrix is obtained from the weighted supermatrix by raising it to powers until all columns are identical to within a certain decimal place. The final priority weights and ranking of each factor categories and KSFs is shown in Table V. In the Table V, the priority weight of factor categories (local weights of factor categories) is equal to sum of its KSFs weights. The priority weights of KSFs within their clusters (local weights of KSFs) are calculated by normalizing their priority weights in the related factor categories.

### Research findings and discussion

This study utilized ANP to solve multi-criteria decision-making problems in which the KSFs of IMD for the Taiwan bulk shipping industry. With respect to the final weights for factor categories as shown in Table V, “international strategy” (0.355) and “environmental scanning” (0.234) are the two most important criteria, followed by “organizational capability” (0.220) and “internationalization behavior” (0.191). The KSFs of “service as competitive advantage” (0.245), “customer satisfaction” (0.286), “financial support” (0.300) and “risk taking” (0.382) show the highest importance with respect to each factor category in the order of “international strategy”, “environmental scanning”, “organizational capability” and “internationalization behavior”, respectively.

Among the four factor categories, “international strategy” is the most important when evaluating the key factors affecting IMD success. This result is further supported by findings that show that considering the appropriate international market entry strategy (either through foreign direct investment or via contractual entry modes) enables firms to deliver high-quality services to customers, significantly impacting overseas business performance (O’Farrell and Wood, 1994; Sanchez-Peinado and Pla-Barber, 2006). Thus, Taiwan bulk shipping firms should formulate a clear international market entry strategy by providing high-quality service specifications and identifying high potential markets, and subsequently should focus its efforts and resources on IMD. Competitive advantage through service differentiation, existing pricing strategies and the closer geographic distance between the home and the host country are the main influences on the choice of international market entry strategies.

“Environmental scanning” was weighted the second. The result indicates that firms must seek environmental opportunities to facilitate the development of international markets (Gunhan and Arditi, 2005; Morschett, 2006; Ripolles *et al.*, 2012). IMD requires market entry strategy as a strategic element, and environmental scanning as a supporting element. Environmental scanning can help firms to monitor and respond external forces (such as changes in customer expectations, improving customer satisfaction and maintaining positive customer relationships) and guides decision makers on how to plan longer term IMD. Additionally, the Taiwan bulk shipping industry should focus on government regulations, such as international promotion and tax laws, to understand their influence on IMD. For example, government regulations may even be advantageous to Taiwan bulk shipping industry as per the case of the 2008 cross-strait sea transport (CST) Agreement that limits shipping across the Taiwan strait to Taiwan, Hong Kong or China-flagged shippers. That is, to satisfy transport demand, the 2008 CST Agreement not only improves the operational efficiency (lowering trade costs and risks by reducing transit time) of Taiwan bulk shipping firms, but also expands international shipping services (Yang *et al.*, 2014).

KSFs in IMD	C <sub>11</sub>	C <sub>12</sub>	C <sub>13</sub>	C <sub>14</sub>	C <sub>15</sub>	C <sub>21</sub>	C <sub>22</sub>	C <sub>23</sub>	C <sub>24</sub>	C <sub>25</sub>	C <sub>31</sub>	C <sub>32</sub>	C <sub>33</sub>	C <sub>34</sub>	C <sub>35</sub>	C <sub>41</sub>	C <sub>42</sub>	C <sub>43</sub>	C <sub>44</sub>	C <sub>45</sub>
Top management support (C <sub>11</sub> )	0	0.242	0.179	0.199	0.193	0	0	0	0	0	0	0	0	0	0	0.048	0.063	0.056	0.071	0.066
Financial support (C <sub>12</sub> )	0.332	0	0.290	0.299	0.321	0	0	0	0	0	0	0	0	0	0	0.091	0.081	0.083	0.092	0.101
IT infrastructures (C <sub>13</sub> )	0.073	0.090	0	0.073	0.079	0	0	0	0	0	0	0	0	0	0	0.022	0.022	0.021	0.023	0.021
Sales teams (C <sub>14</sub> )	0.177	0.224	0.151	0	0.148	0	0	0	0	0	0	0	0	0	0	0.068	0.067	0.069	0.058	0.057
Business expansion (C <sub>15</sub> )	0.159	0.186	0.121	0.169	0	0	0	0	0	0	0	0	0	0	0	0.070	0.066	0.070	0.056	0.054
Customer relationships (C <sub>21</sub> )	0	0	0	0	0	0	0.142	0.182	0.213	0.160	0	0	0	0	0	0.051	0.053	0.048	0.047	0.034
Customer needs (C <sub>22</sub> )	0	0	0	0	0	0.079	0	0.088	0.090	0.075	0	0	0	0	0	0.024	0.031	0.021	0.021	0.029
Customer support (C <sub>23</sub> )	0	0	0	0	0	0.204	0.169	0	0.277	0.199	0	0	0	0	0	0.054	0.047	0.068	0.059	0.063
Customer satisfaction (C <sub>24</sub> )	0	0	0	0	0	0.314	0.303	0.313	0	0.355	0	0	0	0	0	0.074	0.078	0.072	0.061	0.070
Government regulations (C <sub>25</sub> )	0	0	0	0	0	0.191	0.174	0.205	0.208	0	0	0	0	0	0	0.057	0.052	0.052	0.072	0.065
Service as competitive advantage (C <sub>31</sub> )	0	0	0	0	0	0	0	0	0	0	0	0.256	0.258	0.246	0.248	0.080	0.117	0.090	0.094	0.116
Cost-efficiency (C <sub>32</sub> )	0	0	0	0	0	0	0	0	0	0	0.193	0	0.180	0.186	0.184	0.059	0.059	0.054	0.063	0.059
Geographical proximity (C <sub>33</sub> )	0	0	0	0	0	0	0	0	0	0	0.162	0.155	0	0.168	0.173	0.058	0.052	0.062	0.059	0.049
Market potential (C <sub>34</sub> )	0	0	0	0	0	0	0	0	0	0	0.223	0.193	0.185	0	0.204	0.103	0.083	0.094	0.086	0.080
Service differentiation (C <sub>35</sub> )	0	0	0	0	0	0	0	0	0	0	0.232	0.206	0.187	0.211	0	0.057	0.045	0.057	0.053	0.051
Strategic alliances (C <sub>41</sub> )	0.024	0.028	0.025	0.036	0.025	0.020	0.019	0.021	0.017	0.026	0.015	0.018	0.019	0.023	0.023	0	0.010	0.011	0.017	0.014
Timing of internationalization (C <sub>42</sub> )	0.032	0.030	0.030	0.025	0.028	0.021	0.021	0.021	0.023	0.023	0.023	0.023	0.030	0.021	0.024	0.007	0	0.008	0.010	0.009
Overseas networks (C <sub>43</sub> )	0.030	0.032	0.041	0.042	0.035	0.036	0.034	0.029	0.029	0.029	0.030	0.025	0.025	0.029	0.030	0.009	0.008	0	0.013	0.012
Risk taking (C <sub>44</sub> )	0.113	0.103	0.100	0.093	0.104	0.086	0.081	0.093	0.087	0.082	0.072	0.072	0.071	0.072	0.065	0.036	0.036	0.036	0.036	0.050
International experience (C <sub>45</sub> )	0.060	0.067	0.064	0.064	0.066	0.047	0.056	0.047	0.056	0.051	0.050	0.052	0.046	0.046	0.048	0.032	0.031	0.030	0.045	0

Key success factors

Table IV.  
Weighted super matrix

**Table V.**  
Weights and ranking  
of factor categories  
and KSFs of IMD

Factor categories	KSFs	(1) Global weights of KSFs (ranking)	(2) Local weights of factor categories (ranking)	(3) = (1)/(2) Local weights of KSFs (ranking)
Organizational capability (C <sub>1</sub> )	Top management support (C <sub>11</sub> )	0.049 (11)	0.220 (3)	0.222 (2)
	Financial support (C <sub>12</sub> )	0.066 (6)		0.300 (1)
	IT infrastructures (C <sub>13</sub> )	0.020 (20)		0.091 (5)
	Sales teams (C <sub>14</sub> )	0.044 (13)		0.200 (3)
	Business expansion (C <sub>15</sub> )	0.041 (15)		0.187 (4)
Environmental scanning (C <sub>2</sub> )	Customer relationships (C <sub>21</sub> )	0.044 (14)	0.234 (2)	0.188 (4)
	Customer needs (C <sub>22</sub> )	0.022 (17)		0.094 (5)
	Customer support (C <sub>23</sub> )	0.052 (9)		0.224 (2)
	Customer satisfaction (C <sub>24</sub> )	0.067 (5)		0.286 (1)
	Government regulations (C <sub>25</sub> )	0.049 (10)		0.210 (3)
International strategy (C <sub>3</sub> )	Service as competitive advantage (C <sub>31</sub> )	0.087 (1)	0.355 (1)	0.245 (1)
	Cost-efficiency (C <sub>32</sub> )	0.065 (7)		0.183 (4)
	Geographical proximity (C <sub>33</sub> )	0.059 (8)		0.166 (5)
	Market potential (C <sub>34</sub> )	0.074 (2)		0.209 (2)
	Service differentiation (C <sub>35</sub> )	0.070 (4)		0.197 (3)
Internationalization behavior (C <sub>4</sub> )	Strategic alliances (C <sub>41</sub> )	0.020 (19)	0.191 (4)	0.105 (5)
	Timing of internationalization (C <sub>42</sub> )	0.022 (18)		0.115 (4)
	Overseas networks (C <sub>43</sub> )	0.027 (16)		0.141 (3)
	Risk taking (C <sub>44</sub> )	0.073 (3)		0.382 (1)
	International experience (C <sub>45</sub> )	0.049 (12)		0.257 (2)

By reviewing the global weights of the 20 KSFs of IMD in Table V, “service as competitive advantage” (0.087), “market potential” (0.074) and “risk taking” (0.073) have the highest rankings. The evaluators gave “service as competitive advantage” the greatest priority. This is consistent with extant research, which has reported that the performance of the bulk shipping market is related to that of high-quality sea transport services (Lun *et al.*, 2010). This suggests that improvements in the quality of transport services, such as on-time delivery, fast claims response, safety and environment protection, are needed for Taiwan bulk shipping firms to develop international competitiveness.

Not surprisingly, the results show that the second-ranked KSF was “market potential”, which implies that market potential (size and growth) is an important determinant of international strategy (Doherty, 2007). That is, for Taiwan bulk shipping firms in foreign markets, host country environment, as represented by international market size and expansion, is a factor that strongly influences IMD success. “Risk taking” ranked third, which may indicate a risk-taking firm has potential to exploit developing international markets (Brouthers *et al.*, 2009; Bruton *et al.*, 2008). In the context of globalization, the ability of Taiwan bulk shipping firms to cope with or reduce uncertainty and risk is necessary to gauging level of internationalization.

### Conclusions and suggestions for future research

The implications of this study for researchers and managers are two-fold. Academically, although the literature has contributed to identifying key factors related to IMD success, the evaluation of the relative importance of KSFs of IMD has not been empirically determined. Based on the literature review, the analytic structure is constructed from 20 KSFs along with four factor categories in IMD. Then, panelists indicated the inner and outer dependencies

between sub-criteria in the same or different criteria. Companies can expand their international scale to increase sales, competition and growth by focusing on these KSFs. Additionally, evaluators sometimes face decision-making problems, which require specific techniques to deal with complexity and interactions among KSFs of IMD. ANP is one of techniques proposed to solve complex multi-criteria decision-making problems, which has rarely been applied in the IMD context. This study applies the ANP approach to develop an evaluation model that prioritized the relative weights of KSFs of IMD for the Taiwan bulk shipping industry. Analysis of the evaluation results can guide managers in identifying the key influences on IMD success and find the best policy to improve their IMD practice and performance.

Practically, the findings indicate that firm expansion into international markets typically depends on a successful international strategy. Hence, to enhance their global market competitiveness, Taiwan bulk shipping firms should focus their efforts on planning international market entry strategy and prioritizing shipping services with high-potential target markets. For example, the majority of Chinese iron ore imports are sourced from Australia, India and increasingly Brazil, lengthening transportation distances. Geographic proximity and robust commercial ties make the Taiwan and China even closer. Thus, Taiwan bulk shipping firms need to pay attention to their efforts to plan the shipping route from Brazil to China which has sufficient potential and strategic importance to warrant consideration for international seaborne trade. The results also indicate that environmental scanning is a crucial cornerstone of IMD. Managers must view IMD as an important opportunity that warrants continued effort to build the necessary relationships with foreign marketing channel members and customers, in turn further increasing customer satisfaction. The results reveal the important role of international risk-taking in the Taiwan bulk shipping firms. Firms must establish international risk management policies to balance potential gains against losses and avoid costly mistakes. Similarly, managers must continually assess international investment risks and take greater responsibility for risk management to help their organizations develop international markets.

The limitations of this study can be viewed in terms of both methodology and scope. Methodologically, this study uses ANP to develop an evaluation model which helps managers understand the key factors in facilitating the useful strategy of the IMD success. Future studies can adopt additional multi-criteria decision-making approaches (such as TOPSIS and outranking methods) to estimate the relative weights and priorities of KSFs of IMD. The results of future studies can then be compared with those presented here. Moreover, the data collected for this study are based on the Taiwan bulk shipping industry. Further research can apply the evaluation model to other industries, and differences in priority sets are useful for understanding the KSFs of IMD for distinct market segments in various industries. The KSFs of IMD were selected from the literature review; this method may exclude some possible key factors related to IMD success. Future research can use different methodologies, such as surveys, in-depth interviews and longitudinal studies to identify other KSFs of IMD.

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Appendix 1. Aggregated pair-wise relationship matrix

Key success factors

	Organizational capability (C <sub>1</sub> )					Environmental scanning (C <sub>2</sub> )					International strategy (C <sub>3</sub> )					Internationalization behavior (C <sub>4</sub> )				
	C <sub>11</sub>	C <sub>12</sub>	C <sub>13</sub>	C <sub>14</sub>	C <sub>15</sub>	C <sub>21</sub>	C <sub>22</sub>	C <sub>23</sub>	C <sub>24</sub>	C <sub>25</sub>	C <sub>31</sub>	C <sub>32</sub>	C <sub>33</sub>	C <sub>34</sub>	C <sub>35</sub>	C <sub>41</sub>	C <sub>42</sub>	C <sub>43</sub>	C <sub>44</sub>	C <sub>45</sub>
C <sub>11</sub>	*	*	*	*	*											*	*	*	*	*
C <sub>12</sub>		*	*	*	*											*	*	*	*	*
C <sub>13</sub>			*	*	*											*	*	*	*	*
C <sub>14</sub>				*	*											*	*	*	*	*
C <sub>15</sub>					*											*	*	*	*	*
C <sub>21</sub>						*	*	*	*	*						*	*	*	*	*
C <sub>22</sub>							*	*	*	*						*	*	*	*	*
C <sub>23</sub>						*	*	*	*	*						*	*	*	*	*
C <sub>24</sub>						*	*	*	*	*						*	*	*	*	*
C <sub>25</sub>						*	*	*	*	*						*	*	*	*	*
C <sub>31</sub>											*	*	*	*	*	*	*	*	*	*
C <sub>32</sub>											*	*	*	*	*	*	*	*	*	*
C <sub>33</sub>											*	*	*	*	*	*	*	*	*	*
C <sub>34</sub>											*	*	*	*	*	*	*	*	*	*
C <sub>35</sub>											*	*	*	*	*	*	*	*	*	*
C <sub>41</sub>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C <sub>42</sub>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C <sub>43</sub>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C <sub>44</sub>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C <sub>45</sub>	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Notes: \* represents existence of a direct relationship between two key success factor. C<sub>11</sub>: Top management support; C<sub>12</sub>: Financial support; C<sub>13</sub>: IT infrastructures; C<sub>14</sub>: Sales teams; C<sub>15</sub>: Business expansion; C<sub>21</sub>: Customer relationships; C<sub>22</sub>: Customer needs; C<sub>23</sub>: Customer support; C<sub>24</sub>: Customer satisfaction; C<sub>25</sub>: Government regulations; C<sub>31</sub>: Service as competitive advantage; C<sub>32</sub>: Cost-efficiency ; C<sub>33</sub>: Geographical proximity; C<sub>34</sub>: Market potential; C<sub>35</sub>: Service differentiation; C<sub>41</sub>: Strategic alliances; C<sub>42</sub>: Timing of internationalization ; C<sub>43</sub>: Overseas networks; C<sub>44</sub>: Risk taking; C<sub>45</sub>: International experience

Appendix 2. An example of question items in ANP questionnaire

Please compare in pairs the relative importance between two given item statements regarding the KSFs of IMD. If a factor category (or KSF) on the left is more important than the one matching on the right, put your check mark to the left of the importance “Equal” under the importance level you prefer. If a factor category (or KSF) on the left is less important than the one matching on the right, put your check mark to the right of the importance “Equal” under the importance level you prefer. The notations of relative importance are following:

- (1) Absolutely–Absolutely more important
- (2) Very Strongly–Very strongly more important
- (3) Strongly–Strongly more important
- (4) Weakly–Weakly more important
- (5) Equally–Equally important

With respect to the strategic alliances (C<sub>41</sub>)

- Q1: How important is top management support ( $C_{11}$ ) when it is compared with financial support ( $C_{12}$ )?  
 Q2: How important is top management support ( $C_{11}$ ) when it is compared with IT infrastructures ( $C_{13}$ )?  
 Q3: How important is top management support ( $C_{11}$ ) when it is compared with sales teams ( $C_{14}$ )?  
 Q4: How important is top management support ( $C_{11}$ ) when it is compared with business expansion ( $C_{15}$ )?  
 Q5: How important is financial support ( $C_{12}$ ) when it is compared with IT infrastructures ( $C_{13}$ )?  
 Q6: How important is financial support ( $C_{12}$ ) when it is compared with sales teams ( $C_{14}$ )?  
 Q7: How important is financial support ( $C_{12}$ ) when it is compared with business expansion ( $C_{15}$ )?  
 Q8: How important is IT infrastructures ( $C_{13}$ ) when it is compared with sales teams ( $C_{14}$ )?  
 Q9: How important is IT infrastructures ( $C_{13}$ ) when it is compared with business expansion ( $C_{15}$ )?  
 Q10: How important is sales teams ( $C_{14}$ ) when it is compared with business expansion ( $C_{15}$ )?

Please make pair-comparisons among KSFs under organizational capability ( $C_i$ ) with respect to strategic alliances ( $C_{41}$ ).

Questions	Key success factor	Absolutely	Very strongly	Strongly	Weakly	Equally	Weakly	Strongly	Very Strongly	Absolutely	Key success factor											
		9:1	8:1	7:1	6:1	5:1	4:1	3:1	2:1	1:1		1:2	1:3	1:4	1:5	1:6	1:7	1:8	1:9			
Q1	$C_{11}$																				$C_{12}$	
Q2																						$C_{13}$
Q3																						$C_{14}$
Q4																						$C_{15}$
Q5	$C_{12}$																					$C_{13}$
Q6																						$C_{14}$
Q7																						$C_{15}$
Q8	$C_{13}$																					$C_{14}$
Q9																						$C_{15}$
Q10	$C_{14}$																					$C_{15}$

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