International Business Management 9 (3): 273-280, 2015
ISSN: 1993-5250

Examining Hierarchical Importance of Competitive Strategy Components of Penang Port of Malaysia: A Preliminary Study

Muhammad Subhan and Nik Ab. Halim Nik Abdullah
Department of International Business,
UUM-COLGIS, University Utara Malaysia, 06010 Kedah, Malaysia

Abstract: This study is aimed at investigating the importance of Porter's competitive strategy components for main seaport in the Northern Corridor Economic Region (NCER), the Penang Port. This study examines, priority perspectives on the competitive strategy components from various relevant experts or academia using the Analytic Hierarchy Process (AHP) approach. The data were gathered from a study conducted within the NCRC research grant project. About 3 components of Porter's competitive strategy, namely; cost leadership, focus and differentiation were examined. The findings show the hierarchy of importance for each component to be considered by Penang Port authority. This study highlights new implications of using appropriate competitive strategy for Penang Port growth based on its hierarchical approach.

Key words: Strategy analysis, hierarchy analysis, competitive strategy, port competitiveness, AHP approach, Malacca straits, Penang Port, Malaysia

INTRODUCTION

In a borderless world with free market notion, international trade remains an excellent means and trend among world countries to yield their economic growth. In this regard, sea transportation and seaport are seen to be two inseparable arteries for that trend. Today, people may observe that many countries involved in international trade relied heavily on port and maritime for their best choice of transportation mode for the international trade. For instance, China as the world greatest economic growth, at least 90% of its foreign trades was carried by sea (Mingjie, 2010). Generally 89.6% of the global trades, according to a report by UNCTAD (2008) were transported using the sea transportation. Therefore, China has successfully put their six ports to be in ten world busiest ports (Cargo Systems, 2010).

In Southeast Asia, many countries have also positively engaged in port industry. Indonesia, Singapore and Malaysia for instance have been known as port or maritime countries for 100 years. For consecutive years from 2004-2009, port of Singapore has been recognized as the world busiest port before overtook by port of Shanghai in 2010 (WSC, 2012; Cargonews Asia, 2011). Indonesia, Singapore and Malaysia have been successfully put their ports in the top 100 world container ports for many years (Cargo Systems, 2010). These three countries are blessed by having and sharing the straits of Malacca as the world busiest shipping lane. According to MIMA (2012) in 2010 the number of transit vessel movements in the straits reached almost 75000 units while cross traffic movements between Peninsular Malaysia and Sumatra reached 30,000 vessels.

As the port throughput statistics indicates (Table 1), the demand for containerization in ASEAN region and its neighbouring countries has been increasing enormously since a few years ago (Cargo Systems, 2009, 2010; Containerisation International, 2012). Therefore, well-defined strategies are needed to sustain growth of the ports in the region. However, increasing ship traffic congestion, competition in ship sizes, container market

Table 1: Comparison of container throughputs growth between Penang Port and its main rival ports in the region

Port rank	Region/ Port name	Countries	Throughputs (TEU) 2011	2010	Growth (%)
1	Singapore	Singapore	29,937,700	28,430,800	5.30
2	Port Klang	Malaysia	9,603,926	8,870,000	8.27
3	Tanjung Pelepas	Malaysia	7,500,000	6,530,000	14.85
4	Laem Chabang	Thailand	5,731,063	5,068,076	13.08
5	Ho Chi Minh	Vietnam	4,674,326	4,367,900	7.02
6	Jakarta	Indonesia	5,617,562	4,714,857	19.15
7	Colombo	Sri Lanka	4,262,887	4,000,000	6.57
8	JNP	India	4,217,000	4,279,744	-1.47
9	Manila	Philippines	3,250,000	3,154,702	3.02
10	Surabaya	Indonesia	2,643,518	3,030,000	-12.76
11	Penang	Malaysia	1,198,843	1,106,098	8.38
Total			78,636,825	73,552,177	
Average					6.49

Cargo Systems (2010) and Containerisation International (2012) modified by the researchers

Corresponding Author: Muhammad Subhan, Department of International Business, UUM-COLGIS, University Utara Malaysia, 06010 Kedah, Malaysia

Fig. 1: Penang Port strategic location, North gate keeper to the world busiest shipping routes; modified from google maps

growth and depth limitation faced by many port in the region are main challenges to the future development of the ports (Subhan and Ghani, 2011).

Simultaneous with these challenges, the throughput activities at several ports in the region are also significantly increasing (Cargo Systems, 2010; Containerisation International, 2012; PSA, 2008). If we look at Table 1, we will realize that the average increase of container throughputs for the region is at 6.49% for 2010-2011. While some ports in the region experience negative growth, most of the ports experience high growth (Table 1).

Penang Port, even though it has been listed as the least throughput in the region according to Table 1, geographically has advantages of being located at one of the world busiest shipping routes of the Malacca straits (Fig. 1). With this strategic location, Penang Port embraces the locational advantage to be a great port in the region due to it provides broad accessibility to shippers in addition to its position within IMT-GT regions that have a lot of unique resources that can be used to complement the port's growth. However, despite having those advantages and resources, Penang Port is said still having problems to grow as major and dynamic ports in the region compared to its rivals. In one hand, the port growth might be related to its other resource limitations, such as deep-water and land availability for future expansion and so forth but in the other hand as pointed out by some researchers, the Penang Port may face a problem what is called ill-devised strategies or of unclear mechanisms of port growth. Therefore, the purpose of this study is at investigating, the hierarchy importance of the competitive strategy components that can be used for the Penang Port as a basis for its strategy reformulation.

Competitive strategy for Penang Port: In a dynamic competitive business environment, competitive strategy plays a central role for a firm to survive in the industry and sustain competitive advantage. In this situation, the competitive advantage concepts coined by Porter (1990) can be viewed as still significant and important for port strategy in competing with its rivals and sustain growth (Subhan and Ghani, 2011; Robinson 2002). In this regard, the port has to create and sustain core businesses and services that are unique to the port and superior to competitors. In addition to the uniqueness, the ports have to think about durability, inimitability and substitutability and at the same time, create values to the businesses and services. These things should be tailored either to shippers and their ancillary service providers or to inland logistics service providers (Subhan and Ghani, 2011). As discussed by Porter (1990), those areas of competitive strategy that should be given excessive consideration by firms are cost leadership, differentiation and focus of businesses and services. This general argument was supported by port scholars, as applicable to port industry. According to Robinson (2002), the port competitive advantage is something created by port users and their partners that provide those port services or in other words, the competitive advantage is created and maintained through a very local (internal) process (Dussauge and Garette, 1999).

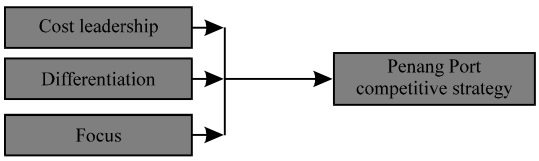

Fig. 2: Framework for analyzing Penang Port competitive advantage (Porter, 1990)

Definitely as in other businesses, there is no single strategy can be considered by a port as powerful enough for sustaining growth and achieving competitive advantage. Devising and formulating strategies based on its hierarchy of importance is likely the best thing that the ports can strive for (Subhan and Ghani, 2011). Each strategy is not superior to the others in all situations but appropriateness of the use of the strategy must be taken into account the levels of competitive environments. In this study, researchers analysed three components of competitive strategy as proposed by Porter (1990) that Penang Port may consider for sustaining growth (Fig. 2).

Cost leadership and differentiation: Porter (1980) claims that there are two alternative strategic positions, common to all industries including port which will provide competitive advantage and of course great returns. The two alternatives are cost leadership and differentiation. Cost leadership offers excess returns by providing a product or service at the lowest cost whereas differentiation provides excess returns by permitting higher prices for a unique product or service offering (Reitsperger *et al*., 1993). Porter (1980) believed that cost leadership and differentiation are incompatible strategies in which if the two strategies are combined or carried out simultaneously, the firm will experience stuck in the middle (Porter, 1985).

Firms achieve cost leadership through process efficiency, inexpensive inputs and economies of scales (Reitsperger *et al*., 1993) or utilizing their partner resources and skills. As in other firms, port also gain cost leadership through efficiency, economies of scale and strategic alliances with others. Port's economies of scale may be reflected from the appropriate estimation of port cost functions (Cullinane *et al*., 2012). Recent studies (Wang *et al*., 2012; Ng, 2012; Wang and Olivier, 2007), found that port of Hong Kong are currently facing cost leadership problem from its competitors. As a consequence, Hong Kong Port was forced to reformulate strategic changes. According to an agreement on Hong Kong/Guangdong co-operation, Hong Kong Port is expected to integrate within the Pearl River Delta (PRD) port cluster, so as to help in establishing a port system within the PRD (Wang *et al*., 2012). This is kind of differentiation, as well as focus strategy components that the port may apply.

Focus: Focus as a component in competitive strategy may include focus a certain segment of customers or product/service line or a specific area of a geographic market. For segmentation of customers, co-operation is a trend by firms. According to Perlmutter and Heenan (1986), the increased worldwide rivalry highlights the need to realize global economies of scale and to cope with internationally diversified customers. They argued that only firms that cooperate across domestic borders will be able to meet these new challenges and compete internationally. In a study by Dyer *et al*. (2001), they found that of the 500 largest firms in the world, they have an average of 60 major collaboration agreements each. International alliances are cooperative arrangements with cross border flows and linkages that utilize resources from autonomous organizations headquartered in separate countries (Parkhe, 1991). According to Holtbrugge (2004), international strategic cooperation has at least three distinct purposes:

Scale advantages: Co-operation allows the partner firms to achieve scale economies and reduce excess capacity by combining similar resources that belong to the same stages in the value adding process.

Resource advantages: Co-operation may also be aimed at combining complementary resources, skills and strengths that belong to different stages in the value adding process.

Learning advantages: Co-operation can also be a means for learning and internalizing new skills.

Ports have to add values on the resources and keep strengthening and enhancing those values continuously and among the efforts that the ports can do is to create cooperative strategy or strategic alliances with the industry players. By strategic alliances, the ports establish cooperation between the ports and other independent firms which can be other ports or logistics companies or other related service providers. In forming strategic alliances, the ports may choose to carry out one or more projects or specific activities jointly where in certain conditions allow members of the alliances to deploy their necessary skills and resources to perform the tasks. In many cases, resources provided by alliance partners from the alliances were able to strengthen their competitive position. Such alliances were done greatly by many ports such as Port of Tanjung Pelepas (PTP) in Malaysia (Subhan and Ghani, 2008).

Another type of focus in port competitive strategy is to focus on certain product or service line and specific geographical areas. Being focus on container market, transhipment service, floating terminal, bulk terminal are examples of segmentation in product/service line in port industry (Subhan and Ghani, 2008; Evers and de Feijter, 2004). Ports also may apply segmentation of specific geographical areas as their focus (Notteboom and Rodrigue, 2005). This meant that identification of specific hinterland of the ports is very crucial for achieving competitive advantage.

MATERIALS AND METHODS

This study uses the Analytic Hierarchy Process (AHP) approach in the analysis to derive the best component for Penang Port competitive strategy according to its hierarchy of importance. Procedure of analysis and evaluations using the AHP approach is described as:

AHP procedure: AHP is a theory of measurement that is widely used in industries as a tool to make important decisions related to business, resource allocation, problem priority identification, performance evaluation and many more (Subhan and Ghani, 2011; Song and Yeo, 2004; Vargas, 1990). AHP is based on the principle that to make decisions, experience and knowledge of people is at least, as valuable as the data they use (Vargas, 1990).

In AHP analysis according to Song and Yeo (2004), requires three steps namely: development of a hierarchical structure for analysis (Fig. 3), i.e., identification of goal that wants to be achieved, development of criteria that are going to use in the analysis and identification of several alternatives that need to be chose in the analysis based on the priority; making pair-wise comparisons to yield priorities for the detailed elements of each level, i.e. for every criterion and alternative; synthesising the priorities into composite measures of the decision alternatives or options.

In this study, the data used for AHP analysis was from a pilot project funded by UUM-NCRC 2013. The data were obtained through the questionnaire designed specifically for AHP purpose. An instruction to the respondents on how to answer the questions was presented in the questionnaire. Informants or respondents for this study were those considered experts in port-related industry from academicians and researchers who have experience related to port development in Malaysia. All informants for this study are those academics from University Utara Malaysia whose hold a PhD degree in relevant fields.

At its initial step, the final goal of the assessment using AHP should be clarified in which in this study the goal is to select the most appropriate strategy component based on the hierarchy assessment from the three components of competitive strategy choices or alternatives for Penang Port namely: cost leadership, differentiation and focus.

To assess the alternatives for the strategy, a set of criteria need to be identified. In this study, four criteria have been set to evaluate and to select the strategy alternatives as suggested by Subhan and Ghani (2011) namely:

Suitability: Whether a chosen strategy is suitable with organizational capabilities, position and surrounding environment and whether a chosen strategy is suitable with the organizational objectives and expectation and its stakeholder.

Acceptability: Relates to expected results from a strategy involving profit, loss, risks and reactions from stakeholder.

Feasibility: Whether a firm has resources and competencies to implement a chosen strategy.

Sustainability: How far a chosen strategy can be remained or sustained as the best strategy for that firm.

From here, we can now transform the structure for AHP analysis as shown in Fig. 3 to suit with condition of this study as shown in Fig. 4 based on the goal, criteria and alternatives for Penang Port.

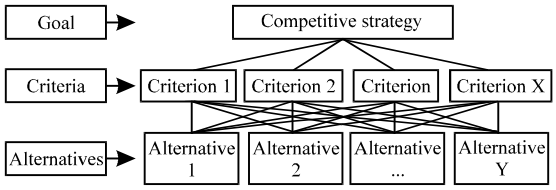

Fig. 3: The structure for AHP approach

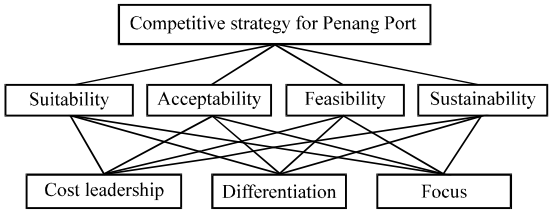

Fig. 4: Hierarchy analysis structure for Penang Port competitive strategy

The second step after developing the hierarchical structure for AHP analysis is to make pair-wise comparisons to yield priorities by giving a weight to each criterion and alternative based on respondents feedback or assessment. The weight (w) is presented in form of a matrix n×n is given as:

$$\begin{bmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \cdots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \cdots & \frac{w_2}{w_n} \\ \vdots & \vdots & & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \cdots & \frac{w_{n1}}{w_n} \end{bmatrix}_{n\times n}$$

Where For every component, the weight is given as:

$$a_{ij} = \frac{w_i}{w_j}$$

where, $a_{ii} = 1$ and $a_{jj} = 1$. Given the value of $a_{ij} = k$, then $a_{ji} = 1/k$. In this study, n = 4 and let w_1/w_1, w_2/w_2, w_3/w_3, $w_4/w_4 = 1$, then we got a matrix as after:

$$\begin{bmatrix} 1 & \frac{w_1}{w_2} & \frac{w_1}{w_3} & \frac{w_1}{w_4} \\ \frac{w_2}{w_1} & 1 & \frac{w_2}{w_3} & \frac{w_2}{w_4} \\ \frac{w_3}{w_1} & \frac{w_3}{w_2} & 1 & \frac{w_3}{w_4} \\ \frac{w_4}{w_1} & \frac{w_4}{w_2} & \frac{w_4}{w_3} & 1 \end{bmatrix}$$

Or it can be written as:

$$\begin{bmatrix} 1 & k_{12} & k_{13} & k_{14} \\ \frac{1}{k_{12}} & 1 & k_{23} & k_{24} \\ \frac{1}{k_{13}} & \frac{1}{k_{23}} & 1 & k_{34} \\ \frac{1}{k_{14}} & \frac{1}{k_{24}} & \frac{1}{k_{34}} & 1 \end{bmatrix}$$

In the questionnaire, respondents were asked to give their pair-wise comparison for every criterion as well as the alternatives by indicating relative importance in a form of 9 scales as follows: 1 = Equal important; 3 = Moderate important; 5 = Strong important; 7 = Very strong important; 9 = Extreme important. Whereas other scales or numbers, i.e., 2, 4, 6 and 8 falls within the earlier numbers. For example, number 2 falls between numbers 1 and 3; number 4 between numbers 3 and 5 and so forth.

Criteria for selecting strategy component: Based on data available for this study, we can create evaluation matrix for pair-comparison as shown as in Table 2. Decimal value used for reporting purposes here are two digits, except for the final or concluding analysis, we use four decimal digits.

Next step is to normalize the matrix for the criteria evaluation, i.e. from the earlier matrix or Table 3. To normalize the matrix, the following procedure is used in transforming pair-comparison matrix into normalization matrix. Given a_{ij} is every component in the pair-comparison matrix and a_{ij} is every component in the normalization matrix and then we can calculate:

$$A_{11} = \frac{a_{11}}{\text{Total weight in column 1}} = \frac{1}{9.66} = 0.10$$

$$A_{12} = \frac{a_{12}}{\text{Total weight in column 2}} = \frac{4}{11.85} = 0.34$$

Similar calculation performed for every component to complete the normalization process. The result (normalized matrix) is shown as in Table 3. From average column in Table 3, we can see that sustainability is ranked as the most important criterion for selecting and evaluating the competitive strategy components in this study comprises of 28% followed by suitability criterion, 26%. Meanwhile, feasibility and acceptability criteria are situated at the third and fourth position, respectively of the most important criteria in considering competitive strategy components for the port.

Table 2: Evaluation matrix for pair-wise comparison for criteria element

Criteria	Suitability	Acceptability	Feasibility	Sustainability
Suitability	1.00	4.00	2.64	2.85
Acceptability	1.92	1.00	2.86	2.58
Feasibility	3.21	3.21	1.00	2.56
Sustainability	3.53	3.64	3.25	1.00
Total	9.66	11.85	9.75	8.99

Table 3: Normalized matrix for criteria evaluation

Criteria	Suitability	Acceptability	Feasibility	Sustainability	Average (rank)
Suitability	0.10	0.34	0.27	0.32	0.26 (2)
Acceptability	0.20	0.08	0.29	0.29	0.22 (4)
Feasibility	0.33	0.27	0.10	0.28	0.25 (3)
Sustainability	0.37	0.31	0.33	0.11	0.28 (1)
Total	1.00	1.00	1.00	1.00	1.00

Table 4: Evaluation matrix for pair-wise comparison for suitability criterion

Alternative	Cost leadership	Differentiation	Focus
Cost leadership	1.00	4.66	4.12
Differentiation	1.54	1.00	3.71
Focus	2.21	1.94	1.00
Total	4.75	7.60	8.82

Table 5: Normalized matrix for suitability criterion

Alternative	Cost leadership	Differentiation	Focus	Average (rank)
Cost leadership	0.21	0.61	0.47	0.43 (1)
Differentiation	0.32	0.13	0.42	0.29 (2)
Focus	0.47	0.26	0.11	0.28 (3)
Total	1.00	1.00	1.00	1.00

Table 6: Normalized matrix for acceptability criterion

Alternative	Cost leadership	Differentiation	Focus	Average (rank)
Cost leadership	0.16	0.53	0.45	0.38 (1)
Differentiation	0.40	0.14	0.43	0.32 (2)
Focus	0.44	0.32	0.12	0.30 (3)
Total	1.00	1.00	1.00	1.00

Table 7: Normalized matrix for feasibility criterion

Alternative	Cost leadership	Differentiation	Focus	Average (rank)
Cost leadership	0.22	0.59	0.49	0.43 (1)
Differentiation	0.36	0.13	0.39	0.29 (2)
Focus	0.42	0.28	0.12	0.27 (3)
Total	1.00	1.00	1.00	1.00

Evaluation of strategy component alternatives: After evaluating criteria for the component selection, the next step in AHP analysis process is to repeat the same steps and procedure for getting pair-comparison matrices and normalized matrices for all strategy component alternatives (three components) for every criterion (four criteria). The first criterion used for the evaluation is suitability. The pair-comparison matrix for the suitability criterion is shown as in Table 4.

Next, this matrix (Table 4) is transformed into normalized matrix as shown in Table 5. It clearly shows that according to suitability criterion, cost leadership component is seen as the most important component for Penang Port competitiveness. This component is perceived almost half or 46% more importance than other competitive strategy components. The component is then followed, respectively by differentiation and focus.

Then, we evaluated components based on the other criteria. Normalized matrices for acceptability, feasibility and sustainability criteria are shown as in Table 6-8, respectively.

From Table 5-8, it is clear that the cost leadership is ranked as the most important strategy component for the Penang Port competitiveness, based on all the four criteria. The importance of cost leadership is then followed by focus and differentiation as the second and the third importance, respectively. We can see that the big gap between the alternative evaluations is given by criterion suitability and feasibility which is more and less 15%.

Table 8: Normalized matrix for sustainability criterion

Alternative	Cost leadership	Differentiation	Focus	Average (rank)
Cost leadership	0.18	0.54	0.46	0.39 (1)
Differentiation	0.38	0.13	0.42	0.31 (2)
Focus	0.44	0.33	0.12	0.30 (3)
Total	1.00	1.00	1.00	1.00

RESULTS AND DISCUSSION

The importance of overall competitive strategy component based on their ranking is needed to be analyzed before a general conclusion is generated using AHP approach. To do this analysis, the following procedure is then to be conducted. Given: As_ik_j = Average normalized weight or score for strategy i based on criterion j; K_i = Average normalized weight or score for every criterion in strategy i; T_i = Overall score or weight for strategy i.

Then, T_i = Total average normalized weight or score for every alternative i based on criterion j multiplied by average normalized weight or score for every criteria in alternative i. Or mathematically can be written for every alternative (three strategy components) as follows:

$$T_1 = (As_1k_1 \times K_1)+(As_1k_2 \times K_2)+(As_1k_3 \times K_3)+(As_1k_4 \times K_4)$$
$$T_2 = (As_2k_1 \times K_1)+(As_2k_2 \times K_2)+(As_2k_3 \times K_3)+(As_2k_4 \times K_4)$$
$$T_3 = (As_3k_1 \times K_1)+(As_3k_2 \times K_2)+(As_3k_3 \times K_3)+(As_3k_4 \times K_4)$$

Using 4-decimal calculation to get best percentage value, we got average score for every criterion as follows: $K_1 = 0.2570$; $K_2 = 0.2126$; $K_3 = 0.2478$; $K_4 = 0.2794$.

From here, the overall evaluation normalized matrix for alternative strategy component selection can be calculated as shown in Table 9. From Table 9, we can observe that cost leadership is perceived as the most important competitive strategy component among other alternative strategy components. The importance of cost leadership is followed by differentiation with 10.56% and focus with 12.43% difference.

From Table 9 and Fig. 5, we can conclude that the perceived importance of competitive strategy components for Penang Port competitiveness based on their priority is as follows:

- Cost leadership (41.00%)
- Differentiation (30.44%)
- Focus (28.58%)

From these results, it is clear for us that the respondents which are experts in the field perceived that cost is still the most important factor to be considered

Table 9: Overall evaluation matrix for all alternative strategies

Alternatives	Suitability (0.2570)	Acceptability (0.2160)	Feasibility (0.2478)	Sustainability (0.2794)	Final weight	Percentage (rank)
Cost leadership	0.430	0.3819	0.4333	0.3925	0.4100	41.00 (1)
Differentiation	0.278	0.2951	0.2723	0.2974	0.3044	30.44 (2)
Focus	0.292	0.3231	0.2943	0.3101	0.2858	28.58 (3)
Total	1	1	1	1	1	100.00

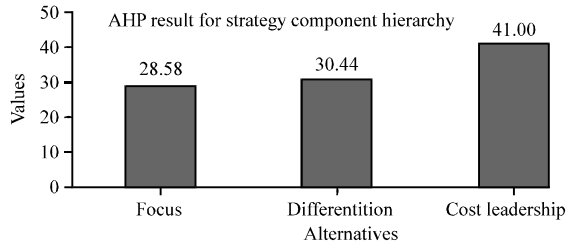

Fig. 5: Final result for all strategy components

for the port competitive strategy. The importance of differentiation and focus factor as elements of competitive strategy for the port are quite different with a gap >10% while there is only slightly difference between differentiation and focus component. This study believed that the Penang Port has the capability to compete with other competitors in the region but to give more priority on cost leadership in the formulation of the port competitive strategy.

CONCLUSION

A port may formulate limitless strategies to achieve its competitive advantage in the port industry. Literature on corporate strategy or business competitive strategy is abundant. Subhan (2010), for instance highlighted six strategies that can be used by ports to formulate its competitive strategy. However in this study, researchers focused more on components hierarchy that contributing to the strategy formulation, especially for port competitiveness based on the generic strategies developed by Porter (1990). This study found that the cost leadership is remained to be the most sought after competitive strategy component by the experts for Penang Port to win the competition in the port industry.

The position of cost leadership as the most important component for port strategy is a general view because researchers did not go to specific time frame for how long the port should apply cost leadership for its competitive strategy and whether the port may or may not shift its strategy to other strategy components. Another thing that researchers can ask is: What are conditions for shifting the strategy components? Those earlier questions become the limitation of this study and researchers expect further research can be conducted in the future to answer these questions.

RECOMMENDATIONS

Based on its initial findings, this study recommends that the port needs to put special attention to cost matters in reformulating its strategy to improve its growth. As many researchers suggested in the literature that a firm or in this regard, a port is highly advised not to combine cost leadership with differentiation but with focus to avoid the so-called stuck-in-the-middle (Porter, 1985) that will increase organizational and operational cost of the port.

REFERENCES

Cargo Systems, 2009. CS top 100 container ports 2008. Informa Plc., London.

Cargo Systems, 2010. CS top 100 container ports 2010. Informa Plc., London.

Cargonews Asia, 2011. Shanghai pips Singapore as busiest container port. Cargonews Asia, January 10, 2011. http://www.cargonewsasia.com/.

Containerisation International, 2012. Top 100 container ports 2012. Informa Plc., London.

Cullinane, K., T. Notteboom, R. Sanchez and G. Wilmsmeier, 2012. Costs, revenue, service attributes and competition in shipping. Maritime Econ. Logist., 14: 265-273.

Dussauge, P. and B. Garette, 1999. Cooperative Strategy-Competing Successfully Through Strategic Alliances. John Wiley and Sons, Singapore.

Dyer, J.H., P. Kale and H. Singh, 2001. How to make strategic alliances work. MIT Sloan Manage. Rev., 42: 37-43.

Evers, J. and R. de Feijter, 2004. Centralized versus distributed feeder ship service: The case of the Maasvlakte harbour area of Rotterdam. Transport. Plann. Technol., 27: 367-384.

Holtbrugge, D., 2004. Management of International strategic business cooperation: Situational conditions, performance criteria and success factors. Thunderbird Int. Bus. Rev., 46: 255-274.

MIMA., 2012. Why is the straits of malacca such an important waterway? Maritime Institute of Malaysia. http://www.mima.gov.my.

Mingjie, Y., 2010. Sailing on a harmonious sea: A Chinese perspective. Global Asia, 5: 22-25.

Ng, A.K.Y., 2012. Container Liner Shipping, Port Development and Competition. In: Maritime Logistics: Contemporary Issues, Chapter 2, Song, D.W. and P.M. Panayides (Eds.). Emerald, Bingley, ISBN: 978-1-7805-2340-8, pp: 5-28.

Notteboom, T.E. and J.P. Rodrigue, 2005. Port regionalization: Towards a new phase in port development. Maritime Policy Manage. Flagship J. Int. Shipping Port Res., 32: 297-313.

PSA., 2008. PSA Singapore terminals handles more than 27 million TEU of containers in 2007. PSA Singapore Terminals, January 10, 2008. http://www.singaporepsa.com.

Parkhe, A., 1991. Interfirm diversity, organizational learning and longevity in global strategic alliances. J. Int. Bus. Stud., 22: 579-601.

Perlmutter, H.V. and D.A. Heenan, 1986. Cooperate to compete globally. Harvard Bus. Rev., 64: 136-152.

Porter, M.E., 1980. Competitive Strategy. The Free Press, New York.

Porter, M.E., 1985. Competitive Advantage. The Free Press, New York, USA.

Porter, M.E., 1990. The Competitive Advantage of Nations. The Free Press, New York, USA.

Reitsperger, W.D., S.J. Daniel, S.B. Tallman and W.G. Chismar, 1993. Product quality and cost leadership: Compatible strategies? Manage. Int. Rev., 33: 7-21.

Robinson, R., 2002. Ports as elements in value-driven chain systems: The new paradigm. Maritime Policy Manage. Flagship J. Int. Shipping Port Res., 29: 241-255.

Song, D.W. and K.T. Yeo, 2004. A competitive analysis of Chinese container ports using the analytic hierarchy process. Maritime Econ. Logist., 6: 34-52.

Subhan, M. and A.B.A. Ghani, 2008. Analyzing growth opportunity of port from the resource-based perspective. Gadjah Mada Int. J. Bus., 10: 353-373.

Subhan, M., 2010. Strategi pertumbuhan sistem pelabuhan: Satu kajian terhadap pelabuhan-pelabuhan Aceh di Indonesia. Ph.D. Thesis, University Utara Malaysia, Sintok-Kedah, Malaysia.

Subhan, M. and A.B.A. Ghani, 2011. The formulating growth strategy of aceh port system in Indonesia: An AHP approach. Gadjah Mada Int. J. Bus., 13: 45-64.

UNCTAD., 2008. Globalization of port logistics: Opportunities and challenges for developing countries. UNCTAD Transport Newsletter No. 38, First Quarter 2008, pp: 5-6.

Vargas, L.G., 1990. An overview of the analytic hierarchy process and its applications. Eur. J. Operat. Res., 48: 2-8.

WSC., 2012. Top 50 world container ports. World Shipping Council. http://www.worldship ping.org/about-the-industry/global-trade/top-50-world-container-ports.

Wang, J.J. and D. Olivier, 2007. Hong Kong and Shenzhen: The Nexus in South China. In: Asian Container Ports: Development, Competition and Cooperation, Cullinane, K. and D.W. Song (Eds.). Palgarve Macmillan, New York.

Wang, K., A.K. Ng, J.S. Lam and X. Fu, 2012. Cooperation or competition? Factors and conditions affecting regional port governance in South China. Maritime Econ. Logist., 14: 386-408.