

SUSTAINING PORT COMPETITIVE ADVANTAGE: AN APPLICATION OF RESOURCE-BASED VIEW APPROACH

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ABSTRACT

This research aims to determine the relationship of port resources and capabilities with the port performance. The data was collected through self-administered survey and mail questionnaires. The results from the findings indicate that port tangible resources such as financial assets, technology assets and physical assets are playing a significant role to increase performance of Malaysian port. Meanwhile, for port intangible assets such as intellectual property assets, organizational assets and capabilities, the study found that these resources have significantly contributed to the higher port performance as compared to port tangible assets. Most interestingly, the findings also discover that the organizational assets such as port culture, structure of the firms, firm human resource policies, port contract in the vertical and horizontal integration and port reputation show the highest significant level as compared to other components in the port intangible assets. This study extends the body of literature related to the source of port competitive advantage. The findings of this research are also providing important contributions for practitioners and policy makers in developing policies and strategies for promoting Malaysia as a world maritime nation.

Keywords: resource-based view, port performance, port competitive advantage, tangible assets, intangible assets, resources, capabilities

INTRODUCTION

The tremendous growth of Malaysian port industry over the last few years underlines the value of the maritime economic sector to its economic well-being. Port and shipping industry are recognized as essential contributors in facilitating trade, hence crucial to its economic prosperity. Ports are also acting as a gateway to domestic and international trade, connecting the region as well as intra-region to the world is crucial in global logistical network (Van Klink & Van Den Berg, 1998). The crucial importance of port industry to the country's economic prosperity can be seen by the commitment of the Malaysian government to invest in the sector as demonstrated in the Regional Economic Corridor. Business Times, 27 August, 2013 reported that Malaysian government has spent RM1 billion to upgrade external infrastructure to support the port expansion at Kuantan Port Consortium (Rupa, 2013).

The fundamental nature of competition in many of the world's industries is changing (Friedman, 2005). Port industry are also substantially changing due to changing in market environment, globalisation, transport revolution, logistic integration and the consequent expansion of the maritime industry Dong-Wook and Panayides (2012). Among the current trends in port industry are the continuing growth in container traffic, increasing ship size, consolidation of port operators with global terminal operators, increasing investment in port infrastructure, for example, have a huge bearing on

the operation and in determining the strategic direction of ports particularly container port. Looking at these trends, port service providers such as port authorities and port terminal operators need to consider the issue of their survival in the heightened competition industry. The above rapid transformation and development within the port industries will significantly result in structural and functional changes among port operators (Robinson, 2002).

In such a situation, port authorities and port operators whose objectives are significantly economic are forced to re-assess their roles and identify their specific competencies that would enable them to achieve and sustain competitive advantage (Yang, Low, & Tang, 2011). In other words, ports need to recognise and capture the new opportunities, define the new core business, as well as to specify relevant core and threshold competencies in order to overcome the above mentioned challenges and to stay ahead from competitors (Hamel & Prahalad, 1994). After identifying their own competencies, they could easily find an effective and suitable business strategy for them to win the competition more efficiently and effectively than other ports. Even though there are many scholars agreed that ports achieve competitive advantage based from its unique combination of port resources and capabilities, port scholars have different views on what main factors that could boost higher port performance are. This raises the needs of an empirical study that examines the effect of port resources and capabilities based on the Resource-Based View (RBV) in Malaysian ports.

This research uses Resource-Based View (RBV) theory in order to get full understanding on how Malaysian ports compete and to identify the major factors influence higher port performance. This perspective concentrated more on what were known as a port intangible resources components (e.g., port structure, port control system, compensation policies, contractual agreement, reputation, culture, human resources management policies) and port dynamic capabilities (e.g. relation ability, routines, employees and managers know-how). Besides these components, the tangible resources components (e.g., port strategic location, port financial capabilities and IT capabilities and port infrastructure) were also evaluated. Specifically, this research attempts to identify, analyse and examine the relationship between port resources and capabilities, with port performance. By identifying which of the resources and capabilities that have more impact towards port performance, it will then shed light on how both the tangible and intangible resources influence port performance and which factors are more important.

LITERATURE REVIEW

There are various strategies that have been implemented by port operators in order to achieve and sustain a competitive advantage. Among the strategies are originated from the ideas of Resource-Based View. Discussing the characteristics of the competitive ports, Resource-Based View has bringing a new paradigm and strategy of achieving higher port performance. This strategy is focus on utilising of port resources and capabilities in order to achieve higher port performance. The competitive advantage of a port is not just by providing efficient services at the terminal and in the cargo handling but it is also an ability of a port to withstand the current trend and market, able to upgrade and enhance their resources and capabilities and find the most efficient way to satisfied customer's needs (Magala, 2004).

Based from the previous port literature, there are many factors that have been identified to be the major sources of competitive advantage. In general, the factors which influence port performance and competitiveness can be fold into two major categories of port resources. These resources are categorised into port tangible and intangible resources. However, recently, previous studies on port competition and performance shows that port scholars tends to give more attention on port intangible resources which also can be referred as port resources and capabilities. Among the factors are cultural differences (Luo, Van Hoek, & Roos, 2001), port reputation (Wiegmans, Hoest, & Notteboom, 2008), port management (Lirn, Thanopoulou, Beynon, & Beresford, 2004), service level (Peteraf, 1993), image marketing (Rozenblat, 2004), port ownership structure (Notteboom, Pallis, & Farrell, 2012), availability of skilled employees, quality of logistic services (Feng, Mangan, & Lalwani, 2012),

quality management practice (Cheng & Choy, 2013) port cooperative relationship (Low & Tang, 2012) horizontal and vertical integration and concentric diversification (Parola, Satta, & Caschili, 2013).

Many researchers that have applied RBV in the context of port industry have tried to understand the kind of competence that a port should possess in order to compete successfully against its rivals. Notteboom and Winkelmanns (2001) had argued that the analysis on port efficiency and productivity is not enough to measure port competitiveness. In the search of core competencies of a port, they proposed a complete strategic planning for a port based on RBV approach.

There are other examples of port related studies that emphasized on the importance of analysing ports based on port's core competencies. Among the studies included, for example a study on how to achieve competitive advantage which emphasized on the important of hinterland and distribution capabilities. Haezendonck and Notteboom (2002) have argued the port would be able to achieve competitive advantage if its hinterland and distribution capabilities are surrounded in highly competent supply chains and intermodal arrangements, greater access to markets and also has excellent coordination of network among the maritime players and market.

The Resource-Based View suggests that port would become more successful in implementing its strategies if they focus on the effective and efficient use of resources. According to Magala (2004) before selecting what type of strategies to compete among rivals, port should be able to identify and classify their port resources and capabilities and this should include the assessment of resources and capabilities should include terms of their potential for sustainable competitive advantage and the appropriateness of their returns. Only after this assessment has been made should port managers select a strategy that enables them to exploit them to exploit effectively the resources of the port relative to external opportunities and competition.

However, Gordon, Lee, and Lucas (2005) analysed port competitiveness based on the combination of port resources and capabilities. Port resources include the port location and the natural deep harbour whereas port capabilities consist of supporting government policies, foreign direct investment and well thought out operation and information technology. All these help to create a sustainable competitive advantage for a port.

From the previous discussion, we have understood that the issues of competitiveness have been widely discussed since the earlier days. It is about how ports utilize their resources, capabilities and competencies to maximize their profitability and expand their market to achieve and sustain their competitive advantage. Even though there are many views that have tried to explain how firms compete and achieve competitive advantage, the main idea behind the competitiveness is about how a firm responds to its environment within its industry and how it uses its own resources and capabilities to achieve higher performance and competitiveness.

DATA

The population for this study comprises all 15 major port operators in Malaysia. From 15 ports, 12 of them are from the Federal Ports and another 3 ports are from Private State Ports. However, only eight ports were selected as the sample for this study. The sampling method for this study is based on the cluster sampling. In term of regionalization, all participating ports in this study are divided into five major regions. For region that has more than two ports, two random sampling were selected on a random sampling basis. The participating ports are namely: Kuantan Port Consortium Sdn. Bhd. from The Eastern Region, Northport (M'sia) Bhd. and Westport Malaysia Sdn. Bhd. from the Western Region, Port of Tanjung Pelepas and Johor Port Bhd. from the Southern Region, Penang Port Sdn. Bhd. from the Northern Region, Bintulu Port Sdn. Bhd. and Sabah Ports Sdn. Bhd. from the East Malaysia.

The unit of analysis of this study was the middle-level and top-level managers of the ports. The selection of the respondents was based on the judgemental sampling. The judgemental sampling was used as this sampling method fulfilled some specific criteria specified by the researcher (Hair et al., 2010). The respondents for this study were selected based on few considerations. The key consideration was that they hold senior management positions within their organizations. Seniority was regarded as an important criterion because it is related to strategic decisions of a firm (Khatri & Ng, 2000). According to Rousseau (1985), organizational concepts should be measured at organizational level. Furthermore, Phillips (1981) stressed that the respondents or informants must have an adequate knowledge to answer the questionnaires in survey-type research and the authority of the potential informant should be considered in order to enhance the response rates.

Given that there are a limited number of respondents from the group of top and middle level management, a strategy to maximize the sample was to target at least 20 respondents including managers and senior executives from each port operator. This approach is accepted in the literature not only as a means of maximizing the number of respondents but also as a means of checking the consistency of responses within an organization (Khatri & Ng, 2000).

There are two types of data collection, which are self-administered and mail survey. In total, 83.7% or 103 respondents participated via self-administered survey. The list of port operators that were involved in survey included Kuantan Port Consortium Sdn. Bhd., Westport (Malaysia) Sdn. Bhd., Northport (Malaysia) Bhd., and Penang Port Sdn. Bhd. The second method was mail survey. This is the second alternative for the researcher as the port authority does not allow the researcher to meet the respondent due the port policies and regulation. The process of administrating the survey is almost similar to self-administered survey process. After the permission to conduct the study was obtained from the related departments, the respondents were informed by the officer in-charge within the related department to participate in this survey. Fifty copies of questionnaires together with the postage-paid reply envelope were sent to the respondent. A follow up call was made two weeks after the questionnaire had been posted to respondents. However, only 20 completed questionnaires were returned. The port operators which involved in the mail-survey were Port of Tanjung Pelepas Sdn. Bhd., Johor Port Bhd., Bintulu Port Sdn. Bhd. and Sabah Ports Sdn. Bhd. In total, the number of respondents who returned the questionnaires was 123 out of which 81 were managers and 42 were executives.

RESULT

Pearson Correlation Analysis Test

A Pearson Correlation Analysis Test was conducted to answer the research question one and two which is to analyze the relationship between tangible and intangible assets with port performance. The computation of the Pearson correlation coefficients was performed to obtain an understanding of the relationship between all the variables of the study.

Table 1 shows the result of Pearson Correlation Analysis. For tangible resources, there is a significant positive correlation between financial assets, physical assets and IT assets and port performance. The strength of the relationship however is relatively weak with the correlation value for each respective construct is only 0.234 ($p < 0.05$), 0.247 ($p < 0.05$) and 0.217 ($p < 0.01$) respectively. It indicates that tangible resources are not a major (or the only) variable that may influence the level of port performance. However, this result shows that port physical assets have high degree of relationship with port performance compared to other type of tangible assets.

Table 1 Pearson correlations analysis of study variables

Variables	PP	FA	PA	TA	IPA	OA	CAP A
Port Performance	1						
Financial Assets	.234**	1					
Physical Assets	.247**	.398**	1				
IT Assets	.217*	.296**	.436**	1			
Intellectual Property Assets	.237**	.159*	.280**	.316**	1		
Organizational Assets	.347**	.287**	.360**	.261**	.415*	1	
Capabilities	.237**	.262**	.361**	.252**	.205*	.406**	1

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

For the correlation between intangible resources which includes intellectual property assets, organizational assets and capabilities with port performance, the result also indicates positive significant correlations between all variables. The correlation value for tangible resources and port performance however are much higher than the previous tangible assets with the range of correlation values from .237 to .347. Intellectual property assets is significant with r value of 0.237 ($p < 0.01$), capabilities assets is significant with r value of 0.237 ($p < 0.01$ level) and organizational assets is significant with r value of 0.347 ($p < 0.01$). Based from the results it can be concluded there is relatively strong relationship between port organizational assets and performance as compared to other tangible and intangible assets.

Pearson correlation result also indicates that there is a significant positive correlation between each independent variable. The correlation value is in between 0.159 to 0.436. Based from the correlation matrix, the highest correlation score is between financial assets and IT asset ($r = 0.436$), followed by intellectual property asset and organizational assets ($r = 0.415$), then organizational assets and capabilities ($r = 0.406$).

Multiple regression Analysis

The third research question is to identify the most influential factor among the tangible and intangible assets that impact port performances. In order to determine the overall effect of the tangible and intangible assets on port performance, a multiple regression analysis was conducted. The stepwise method was used in order to analyze the impact of the independent variables on dependent variable in the multiple regression. The acceptance criterion of probability of F for the stepwise method is less than 0.050 and probability F to remove is less than 0.100. Based from the results, only organizational assets and capabilities met those criteria and this means that other independent variables including physical assets, financial assets, IT assets, and intellectual property rights are excluded in this model. In this stepwise method, the regression results are divided into two models. The first model analyzed the impact of organizational assets only on port performance. The result in Table 3 shows that the regression equation for the first model (model 1) explains more than 11.3% of the variability in port performance. This adjusted R square value is an acceptable value based from the analysis of variance test statistic (ANOVA). The adjusted R square value is an acceptable value based from the analysis of variance test statistic (ANOVA). The standard error of the estimate also shows the acceptable value (2.52) which is more than the minimum requirement (2.47). The ANOVA result in Table 4 shows the F value of 16.543 ($p = .00$), which indicates that organizational assets significantly influence port performance.

The second model is to analyze the impact of both the organizational assets and capabilities on port performance. The result in Table 2 shows that the adjusted R square has increased after the inclusion of port capabilities into the first model. Model 2 explains 14% of the variability in port performance, compared to 11.3 previously. Based from the result, the standard error of the estimate also shows the acceptable value (2.48) which is more than the minimum requirement.

Table 2 Model summary of regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.347	.120	.113	2.52459
2	.393	.154	.140	2.48585

- a. Predictor: (Constant), Organizational assets
- b. Predictor: (Constant), Organizational assets, capabilities

Table 3 ANOVA results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	105.436	1			
	Residual	771.198	121	105.436	16.543	.000 ^a
	Total	876.634	122	6.374		
2	Regression	135.100	2			
	Residual	741.535	120	67.550	10.931	.000 ^b
	Total	876.634	122	6.179		

Predictor:(constant), organizational assets
 Predictor:(constant), organizational assets, capabilities
 Dependent Variables, Port Performance.

Based from the ANOVA results in Table 3, F value of 10.931 (p=.000) indicates that the combination of organizational assets and port capabilities are also significantly influencing port performance. Table 4 shows the correlation coefficient of the two models. For the first model where organizational assets are the independent variables, they were found very significant and the t-value is 4.067 (Beta = 0.347, p <0.01). For the second model, both organizational assets and port capabilities were included in the regression analysis. Based from the result, the t-value of the organizational assets is 2.886 (Beta = 0.265, p <0.005), while port capabilities have a t-value of 2.191 (Beta = 0.201, p < 0.05).

Based from these results, it can be concluded that it is possible to accept the hypotheses which argued that the intangible assets or specifically organizational assets have more impact on port performance as compared to the tangible assets as the Beta and T-value for organizational assets are relatively higher than port capabilities. The final model on port performance therefore should consists of both the organizational assets and port capabilities as it has a higher adjusted R square value ($R^2 = 0.140$).

Table 4 Coefficient result

Model	Unstandardized coefficient		Standardized coefficient	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	6.5670	1.933		3.368	.001
Organizational Assets	.285	.070	.347	4.067	.000
2 (Constant)	3.708	2.293		1.617	.108
Organizational Assets	.218	.076	.265	2.886	.005
Capabilities	.177	.081	.201	2.191	.030

a. Dependent variable: Port Performance

CONCLUSION

According to the findings in this study, port managers should realize that port resources whether they are tangible or intangible assets do influence port performance. Port resources should be considered as part of entire system in the supply chain rather than in isolation, and thus port competitiveness depends on how port can really integrate and coordinate all the resources available towards achieving higher competency and compete against other rivals. However, a combination of some resources especially the organizational assets and port’s capabilities itself could have a bigger impact on their success.

Organizational assets, which include culture, HRM policies, port structure and ownership and ports contract, have the greatest impact on port performance. Culture has long been seen as a major driver of firm success because it determine attitudes, beliefs, customs, values, and habits that set the decision-making pattern of the firm (Barney, 1986; Itami & Roehl, 1987). Therefore, port management should develop a unique organizational culture that consists of norms and rules that will create an environment for maximum workers’ productivity and performance. HRM policies are also important for competitive advantage (Lado, 1994). Good HRM policies are important organizational assets that may reduce employee turnover and improve productivity, thus impacting on port success and performance. The best HRM practice also relate with the port structure and ownership. Given the changing nature of port competition today, ports ownership and structure that creates speed and efficiency in responding to ever changing market and customers need also seems important.

Port operators these days should also consider the establishment of contractual agreements in the form of horizontal or vertical integration with other port operators or any other supply chain partners as it plays a significant role towards achieving port competitiveness. Managers should understand that the ports success depends on the ability to integrate the port effectively into the networks of business relationships that shape the supply chains. Therefore, port managers should be able to fully exploit synergies with other transport nodes and other players in the logistic networks of which they are part.

Despite the importance of organizational assets, this study has found out that other resources such as financial assets, physical assets, port IT assets and intellectual property assets have a positive relationship with port performance. Therefore, these resources should not be neglected at all even though the multiple regression analysis shows that organizational assets and port capabilities are the factors that should be given priority. In practical sense, the incorporation of RBV theory in this study hopefully will provide port managers with better understanding on the source of firm’s competitive advantage, performance and profitability and particularly the importance of intangible resources that capable of becoming firm’s strategic assets. While resources identification is often easy once resources have been developed, managers will glean more insight into identifying resources before strategies are implemented. The RBV provides valuable framework to the managers as it enables understanding into the facets of resources development and a firm’s relationship to outside competition. Managers who understand and use their key resources as suggested by RBV will

improve the utility of the RBV thus will contribute to the body of strategy literature (Barney & Hesterly., 2012).

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