

# **LOGISTICS AND VALUE-ADDED SERVICES PROVIDED BY MARITIME COMPANIES**

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## **ABSTRACT**

The increasing need for shipping companies to offer logistics and value-added services is driven by factors such as globalisation and growing demand from customers. The study firstly aims to analyse shippers' requirements on logistics and value-added services, then the various practices and status of such services offered by the world's top thirty shipping lines and their affiliated logistics service providers. The nature and extensiveness of logistics services offered will be discussed. The study also aims to examine shippers' expectation on the service attributes of logistics solutions and compare these service attributes to maritime companies' understanding of these expectations. Data and information from both primary and secondary sources are examined and used to draw empirical evidence. While the major maritime companies are in line with shippers' requirements in terms of the type of logistics functions offered, perceptual differences between shippers and shipping firms exist with regards to logistics service attributes. When maritime firms review their directions and strategies of their logistics and value-added services, they may take into consideration the competencies involved, competition from rival shipping firms and third-party logistics providers, as well as other external factors. Useful insights and recommendations can be drawn for maritime firms, shippers, logistics service providers and other relevant parties.

Keywords: logistics services, value-added services, shipping lines, maritime, service attributes

## **1. INTRODUCTION**

The majority of the world's seaborne trade in merchandise goods is carried by liner shipping. Shipping lines are important facilitators to global trade. As a mature global service industry, the shipping services provided by liners are viewed as homogenous by shippers (Brooks, 1993). Shippers find it more difficult to perceive the difference between various carriers. Coupled with the challenge of overcapacity in recent years, shipping lines are constantly under pressure to find new ways to sustain their competitiveness. Shipping lines struggle to create differentiation and one of ways is through the provision of logistics and value-added services. The increasing need for shipping companies to offer such services is driven by factors such as globalisation and growing demand from customers. According to a large scale survey on shippers across all continents (CI, 2006), over 70% of the respondents believed that it is appropriate for ocean carriers to offer logistics services in competition with independent agents, i.e. third-party logistics service providers. Not only do many shippers want ocean carriers to better understand their supply chain issues and constraints, but also want ocean carriers to execute and/or manage their supply chains on a door-to-door basis. Another report (Fairplay, 2006) also echoed similar view. The report added that attracting large shippers and developing new revenue/ business schemes are also reasons for shipping companies to venture into the logistics territory. Among those shippers which have not integrated deep-sea shipping and logistics, 50% indicated that they would go for integration within five years and thus requiring more 'one-stop shop' service (CI, 2008).

Hence, it is evident that there is strong demand for shipping companies to provide logistics and value-added services. Shipping firms should observe the phenomenal issues and ride on the challenges and opportunities that arise in order to stay competitive. In other words, those firms which are unable to build up their logistics capability effectively would not meet shippers', especially global shippers' comprehensive requirements. Most of the major shipping lines today have made substantial investments in the area of logistics and claim to be capable of providing customized services in response to the needs of their customers (Fremont, 2009). Our study is devoted to deepen the understanding of this research area by empirical means. The study firstly aims to analyse shippers' requirements on logistics services, then the various practices and status of logistics and value-added services offered by the world's top thirty shipping lines and their affiliated logistics service providers. The nature and extensiveness of logistics and value-added services offered will be discussed. The study also aims to examine shippers' expectation on the service attributes of logistics solutions and compare these service attributes to maritime companies' understanding of these expectations. The paper will draw implications and recommendations for the relevant parties concerned.

## **2. LITERATURE REVIEW**

Some studies were conducted to analyse shippers' expectation on container shipping lines and the shipping services provided. These include Brooks (1990, 1993), Lu (2003a), Durvasula *et al.* (2000, 2004). While some reference can be drawn from these papers, the focal point of our study is logistics services but not ocean carriage. Hence, logistics papers are also consulted.

There were a number of studies which discussed the service attributes related to logistics services. Stock and Lambert (1992) investigated the relative importance of logistics service and how companies within various industries performed on these service attributes. It was concluded that firms that wish to develop high level logistics service must benchmark against the requirements of customers. The study conducted by Semeijn (1995) through a survey with international shippers located in the United States revealed that the most important attributes were reliability, timeliness, and cost. Shipping companies' point of view was not well represented as only a few global carriers participated in the survey. Theoretically, shipping lines will only be successful when no perceptual gap exists between the expectations of customers and the types of services provided by shipping lines (Semeijn and Vellenga, 1995). In reality, shippers' needs are constantly changing. Therefore, it is important that shipping lines are constantly updated on the needs of customers. In a study by Lu (2000), surveys and interviews with liners, shipping agents and ocean freight forwarders were carried out to demonstrate the logistics services provided by Taiwanese maritime firms. The paper identified value-added and integrated service as key factors associated to service attributes in the firms. However, this research was only conducted with the service providers. Also, the above studies did not conduct comprehensive analysis on both shippers and shipping companies and no comparison of their perceptions could be done.

We find two relevant papers with regards to research on perception difference. Kent and Parker (1999) conducted a survey to analyse the viewpoints from deep-sea container carriers and import and export shippers. Significant differences between import shippers and carriers were found on loss and damage and equipment availability factors. Significant differences between export shippers and carriers were rate changes, service frequency, financial stability, service changes, and equipment availability factors. Another study is by Lu (2003b), who used a gap analysis of the levels of importance and satisfaction accorded to service attributes in a partnering relationship by shippers and maritime firms. The survey results showed that the relative importance of service attributes differed between shippers and maritime firms. The satisfaction levels with respect to service attributes such as knowledgeability of sales personnel, ability of sales representatives to handle problems and simplification of tariffs were significantly

different. Again, these two studies did not specifically target logistics service attributes. As a whole, our research attempts to fill in the gaps existed in the literature.

The literature presented shows that logistics service attributes do not merely involve logistics strategy but rather a range of strategies including marketing-related strategies, financial strategies and price-related strategies. Our survey instrument employed was formulated based on a broader spectrum of attributes reflective of prospective strategies.

### **3. RESEARCH METHODOLOGY**

The research was conducted in three stages. Stage 1 was literature review and conceptual development. Relevant papers and concepts were consulted and analysed. This helped to formulate the research framework and data collection process. With reference to past literatures, seventeen service attributes were selected for use in the questionnaire in the next stage. Stage 1 was then followed by empirical investigations in Stage 2. Data and information for empirical investigation were collected from both primary and secondary sources through various methods. Preceded by a pilot survey, primary data collection was done via an email survey in the first half of 2009 with the aim to understand shippers' logistics requirements and maritime firms' perceptions. Singapore-based global shippers were randomly selected from a database drawn from Singapore company directory and company websites. Survey questionnaires were sent to 1198 executives. After a few rounds of reminder emails and phone calls, 108 completed surveys were returned representing a response rate of 9%. As for maritime firms, a sample of executives from the world's top thirty shipping lines and their affiliated logistics service providers was randomly drawn. Similarly, several rounds of emails and phone calls were made. The email list consisted of 995 executives and respondents counted 102 with a response rate of 10.3%.

Secondary data collection was to investigate the nature of logistics and value-added services provided by maritime companies. Data and information sources were gathered from databases, market reports, news, shipping companies' and other websites, etc. The analysis involved compilation, summary, comparison and classification of the data and information. Lastly, in Stage 3, in-depth interviews were conducted with two global leading shipping companies and two global shippers in the last quarter of 2009. This was to validate and advise on the survey findings from different perspectives of the market. The three-stage procedure is rigorous and systematic; triangulation involving a combination of interviews and questionnaire survey is synergistic. As a whole, higher research validity and reliability can be attained.

## **4. RESULTS AND DISCUSSION**

### **4.1 Shippers' requirements on logistics and value-added services**

In order to understand the type of logistics and value-added services required by shippers, one part of the survey questionnaire to shippers is for them to indicate the logistics functions that they outsourced. There were 24 logistics functions for shippers to choose from. Table 1 shows the six most often outsourced logistics functions identified.

Table 1. Six most often outsourced logistics functions

Rank outsourcing function (out of 24)	Logistics function	Percent outsourced
1	Terminal handling	100
2	Customs brokerage	89.5
3	Transshipment/ Relay	89.2
4	Outbound land transportation	84.8
5	Inbound land transportation	83.7
6	Customs clearance	83.0

In industry practice nowadays, ocean transportation of cargoes is always complemented by a lift on and off a vessel performed by terminal operators. Any necessary transshipment or relay is usually arranged by shipping companies. Terminal handling and transshipment/ relay are an integral part of deep-sea carriage and shippers usually do not arrange such functions separately. This is why they are the most often outsourced as shown in table 1. Since this is already an industry norm, more attention is dedicated to other logistics services.

It can be seen that customs related functions are very often outsourced. Customs brokerage (89.5%) and customs clearance (83.0%) are ranked as second and sixth out of the 24 logistics functions. Since ocean transportation mostly involves international trade, customs clearance and brokerage is required before and after ocean transportation. Hence, ocean transportation plus customs clearance and brokerage go hand in hand and are highly required by shippers. Outbound land transportation (84.8%) and inbound land transportation (83.7%) are highly required by shippers representing the fourth and the fifth most often outsourced logistics functions. Land transportation in

terms of trucking and railway is necessary to carry the goods from shippers' premise and to consignees' premise before and after ocean transportation. Increasing multimodal and door-to-door practices suggest that such functions become more important.

#### 4.2 Logistics and value-added services provided by maritime companies

After understanding shippers' perspective, this part of the research serves to find out the extent of logistics and value-added services provided by maritime companies to see if they match shippers' demand. Based on various secondary data and information with cross checking, we searched for all the logistics functions offered by the world's top thirty shipping lines and their affiliated logistics service providers. All items found for each company were grouped into a hierarchy of functions and services, following the classification used by Semeijn and Vellenga (1995). This approach enables us to analyse these services more systematically. Figure 1 illustrates the four levels of logistics service items and their key characteristics.

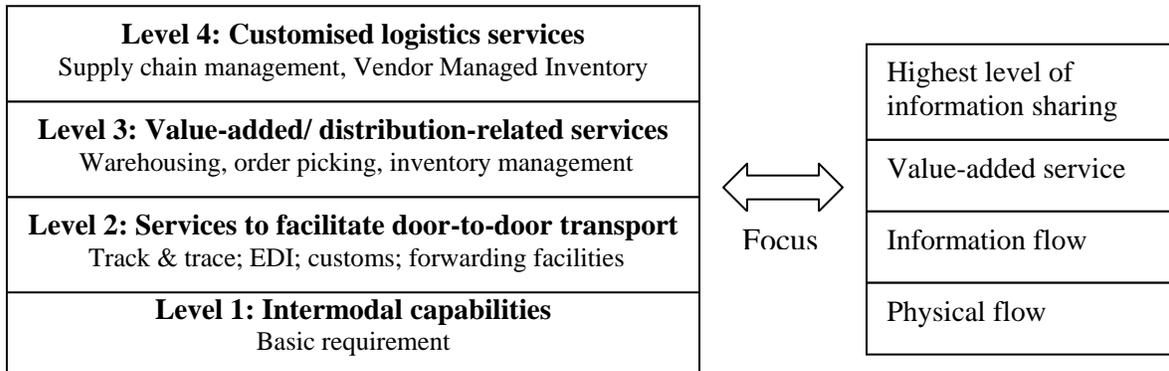


Figure 1 Four levels of logistics service items and main characteristics of each level

The results were also validated by the four interviews conducted. Table 2 summarises the research findings. Five major trends are observed.

1. Most of the top 30 liners and the affiliated firms (except Sea Consortium, TS Lines and Swire Shipping) offer logistics service.
2. The top 20 shipping companies (except MSC) plus MISC and IRIS can offer the most outsourced logistics functions identified by shippers.
3. The companies generally have higher capability to offer logistics service in levels 1 to 3.
4. All top 15 shipping companies (except MSC) offer level 4 logistics service.
5. Shipping companies ranked 21<sup>st</sup> to 30<sup>th</sup> (excluding MISC) have much lower logistics service capabilities.

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Table 2 Classification of logistics functions provided by maritime companies

Maritime Firms	Level 1 Intermodal Capabilities				Level 2 Services to facilitate D2D transport				Level 3 Value-added / Distribution-related services				Level 4 Customized logistics services			
	Ocean	Feeder	Trucking	Rail	Track, trace	Freight. Forward	Customs	EDI	Warehousing	Distribution	Invent. Mgt	Label/Pack	Distri Design	Facil. Design	Sys. Integrate	SCM soln.
APM	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x
MSC	x				x											
CMA	x	x		x		x			x	x		x				x
Evergreen	x		x	x	x	x	x		x	x	x	x	x	x		x
Hapag	x		x	x	x	x	x	x	x	x	x	x			x	x
COSCO	x	x	x	x	x	x	x		x	x	x	x			x	x
APL	x		x	x	x	x	x		x	x		x	x	x	x	x
CSCL	x		x		x		x		x							x
NYK	x		x	x	x	x	x		x	x	x	x	x			x
MOL	x		x	x	x		x	x	x	x	x	x	x		x	x
Hanjin	x		x	x	x		x	x	x	x	x	x			x	x
OOCL	x		x		x	x	x	x	x	x	x					x
Y. Ming	x				x	x	x		x		x	x				x
K Line	x		x		x	x	x		x	x	x	x			x	x
Hamburg	x		x		x		x		x			x				x
ZIM	x		x	x	x	x	x		x							
CSAV	x		x	x	x		x		x	x	x					
H.M.M	x		x	x	x		x		x	x	x	x				x
PIL	x		x	x	x	x	x		x	x	x	x				x
UASC	x		x	x	x		x		x	x	x	x				
Wan Hai	x				x											
IRIS	x		x				x		x	x						
MISC	x		x	x	x		x	x	x	x	x	x			x	x
Grimaldi	x				x											
Sea Con.		x														
RCL	x				x											
CCNI	x				x											
Maruba	x	x	x		x					x						
TS Lines	x															
Swire	x															

In general, it is evident that major maritime companies are in line with shippers' requirements in terms of the type of logistics functions offered. But the research findings also reveal a divergence in shipping lines' strategy towards their business focus. While 14 of the top 15 shipping companies have identified logistics service as a viable business avenue and have developed the highest extent (level 4) of logistics service capabilities, MSC (the world's second largest shipping lines) appears to focus on port-to-port services. The interviewees revealed that MSC's approach is based on a "low-cost, no-frills" strategy. Offering low-cost solutions takes the priority over achieving high service standard. However, MSC's strategy would prove advantageous especially during economic downturn when shippers are expected to favour low-cost services. Furthermore, MSC's unique stance also serves as a market indicator that it focuses on its core competency in ocean carriage and excels in it.

While shippers tend to outsource logistics functions which are more operational, transactional and repetitive in nature, majority of the top shipping lines are already engaged in levels 3 and 4 logistics service. This trend provides evidence of increasing sophistication in customers' logistics service demand and shipping lines' need to become more efficiently part of customers' global production networks. Major shipping lines have developed extensive door-to-door service capabilities to be in a better position offering an integrated approach towards customers' production, consumption and distribution requirements (Notteboom and Merckx, 2006). There are three logistical drivers and three cross-functional drivers in a supply chain as identified by Chopra and Meindl (2007). They are facilities, inventory, transportation, sourcing, pricing and information management. While shipping lines focus on offering cheaper and more reliable shipping services, it is evident that they are also increasingly active in helping customers manage the other five supply chain drivers through various activities listed in Table 2.

#### **4.3 Comparison of shippers' and maritime companies' perception on logistics and value-added service attributes**

While understanding the type of logistics functions required by shippers is important, analysing the functions' service attributes will generate deeper insights in the research topic. This section examines shippers' expectation on the service attributes of logistics solutions and compares these service attributes to maritime companies' understanding of these expectations. In the survey, the respondents were asked to rate the importance of 17 service attributes in the context of logistics service by a continuum numerical scale with 1 representing "the least important", 5 denoting "the most important". Table 5 provides a summary of the mean scores and rankings according to the responses of shippers and shipping companies.

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Table 3 Mean comparison of logistics service attributes

Rankings of Shippers' Scores	Logistics Service Attributes	Mean Score <sup>a</sup>		ANOVA p-value
		Shippers	Maritime companies <sup>b</sup>	
1	Accurate documentation	4.67	4.37 <sup>3</sup>	0.117
2	Low damage or pilferage performance	4.57	4.00 <sup>6</sup>	0.003*
3	Low freight rate	4.50	3.42 <sup>15</sup>	0.000*
4	Price flexibility	4.47	3.63 <sup>11</sup>	0.000*
5	Transit time reliability	4.40	4.42 <sup>1</sup>	0.917
6	Transit time speed	4.40	3.63 <sup>11</sup>	0.001*
7	Good reputation	4.40	4.42 <sup>1</sup>	0.907
8	Prompt pick-up	4.20	3.74 <sup>10</sup>	0.087***
9	Good financial condition	4.20	3.79 <sup>9</sup>	0.049**
10	Provision of just-in-time service	4.07	3.37 <sup>16</sup>	0.009*
11	Fast claim settlement	4.00	3.05 <sup>17</sup>	0.000*
12	Provision of cargo tracking and tracing Service	4.00	4.00 <sup>6</sup>	1.000
13	Good Geographical Coverage	3.80	4.05 <sup>5</sup>	0.354
14	Control over inland transportation	3.70	4.11 <sup>4</sup>	0.261
15	Presence of local office	3.67	3.58 <sup>13</sup>	0.599
16	Capability to handle special product	3.67	3.58 <sup>13</sup>	0.607
17	Ability to provide customized logistics services	3.47	3.84 <sup>8</sup>	0.290

<sup>a</sup> 1= Least Important; 5= Most Important

<sup>b</sup> Superscripts in the column indicate the rankings of shipping companies' scores

\* Significance level  $p < 0.01$ .

\*\* Significance level  $p < 0.05$ .

\*\*\* Significance level  $p < 0.1$ .

#### **4.3.1 Overview of shippers' expectations**

The mean score comparison of the 17 logistics services attributes reported by the shippers reveals "Accurate documentation" as the most important service attributes with a mean score of 4.67. Other service attributes that were rated highly by the shippers include "Low damage or pilferage performance" with a mean score of 4.57 and "Low freight rate" with a mean score of 4.50.

Accurate documentation is the most fundamental service attribute that the shippers expect from shipping lines. Documentation facilitates the movement of freight, transfer of title, processing of payment, and customs clearance. Any discrepancies in documentation can result in a range of problems arising in the form of delays of shipments, penalties being imposed, additional costs being incurred, and freight being rejected at the discharge destination. Moreover, documentation is often needed in consignment tracing and when handling loss and damage claims. In such situation, it is important that all crucial information is properly documented. Therefore, it is understandable as to why shippers placed highest importance on the service attribute of "accurate documentation".

During transportation of cargoes, shipping lines are obliged to move freight with reasonable dispatch and to undertake reasonable care to prevent loss and damage. If shipping companies are held liable for cargo loss and damage, they have to compensate shippers' losses. Although shippers' direct costs are compensated by the shipping lines, there remain certain imputed costs that the shippers are liable to. Damage and pilferage can cause inconvenience or higher inventory costs for the customers of the shippers when order batches are not received on time. Shippers will then be exposed to claims raised by their customers. In such situation, shippers can incur additional expenses in gathering evidence, processing claims and possibly court actions. In addition, intangible costs such as loss of creditability are also incurred by the shippers. The service attribute of "low damage and pilferage performance" was used as a form of gauge on the security level provided by shipping lines. This therefore explains the high importance of such service attribute.

In recent years, shipping and logistics industries are faced with fiercer competition in tightening markets. The severe economic downturn started in the third quarter of 2008 causes many shippers to review their operations with cutting cost as the aim to maintain financial performance and corporate survival. This further intensifies the competition among logistics service providers. Hence, "low freight rate" was rated as one of the important service attributes on the list.

#### **4.3.2 Shipping firms' understanding of shippers' expectations**

The tabulated results show that maritime firms rated highly for the logistics service attributes of “good reputation”, “transit time reliability” and “accurate documentation”. The firms perceived the reputation of the company as a crucial service attribute to the shippers. Corporate reputation has always been a major concern for companies and was often used by Asian executives to drive tangible business benefits (Lines, 2003). With such acute focus on the development of corporate reputation with the aim to gain higher returns, it is not surprising to have executives in maritime firms perceived “good reputation” as the top service attribute that are important to customers. “Transit time reliability” and “accurate documentation” are the other service attributes with highest mean scores. This survey finding coincides with Lu's (2000) study on the topic of “Logistics Services in Taiwanese Maritime Firms” where the reliability of advertised sailing schedules and accurate documentation were perceived as the most important service attributes by the shipping companies and forwarders.

#### **4.3.3 Perceptual differences between shippers and shipping firms**

In comparing shippers' expectations on logistics service attributes to shipping firms' understanding of these attributes, the rankings of shippers' mean scores and shipping firms' mean scores were examined. Statistically, the Analysis of Variance (ANOVA) test on the mean scores of each attribute was also performed. Table 3 reports the associated p-value.

Both the shippers and the shipping firms rated highly for the service attribute of “accurate documentation” with shippers' ranking as the first with a mean score of 4.67 and shipping firms' ranking as the third with a mean score of 4.37. The p-value (0.117) of the ANOVA test suggests that the two means are not significantly different from each other. In addition, both shippers and shipping firms rated the service attributes of “Presence of local office” and “Capability to handle special product” as one of the least important service attributes. Their p-values of 0.599 and 0.607 respectively prove that their mean scores are statistically close to each other.

The most important and largest perception gaps between the shippers and the maritime firms are for the services attributes of “low freight rate”, “price flexibility” and “low damage or pilferage performance” as judged by very low p-values of the ANOVA test. Importantly, shippers perceived these attributes as some of the most crucial attributes. Maritime firms which are unable to understand the significance of these attributes will put themselves in a disadvantageous position. Big difference in mean scores also exist in the attributes of “Transit time speed”, “fast claim settlement”, “provision of just-in-time service” and “good financial condition”.

It is noted that “Low freight rate”, “price flexibility”, “fast claim settlement” and “good financial condition” are all price- and financial-related attributes. The large difference between shippers’ and shipping firms’ perceptions could be primarily due to shipping firms’ move to cover costs and shippers’ price sensitivity especially during economic recession. Shipping firms face the dilemma that a substantial sum of investment in logistics services needs to be recovered through reasonable freight rates which shippers may not accept. Shippers are essentially concerned with getting the right product to the right place, at the right time and at the lowest possible cost. Thus, other than those fundamental requirements on documentation and low damage, those attributes affecting shippers’ cost are highly prioritised.

## **5. MANAGERIAL IMPLICATIONS AND RECOMMENDATIONS**

The paper has presented some new findings on the logistics and value-added services provided by maritime companies. The research outcomes should assist shipping companies and logistics service providers at large to understand shippers’ logistics requirements. Shippers can also better appreciate maritime firms’ logistics capability. When maritime firms review their directions and strategies of their logistics services, they may take into consideration the competencies involved. While the benefits associated with the provision of logistics and value-added services are recognised, it is important to note that not all companies will be able to reap the full benefits from the provision of such service. Firms that wish to provide logistics service must devise an appropriate strategy in order to achieve competitive advantage. From the resource-based point of view, firms are able to achieve superior returns by best exploiting the internal resources and capabilities (Barney, 1999; Grant, 1999). It is advisable for service providers to build up their core competencies by leveraging on those significant logistics functions and service attributes, underpinned by the resources deployed.

Maritime firms can continue to focus on those fundamental logistics services that are most outsourced by shippers. While some firms such as APM, Evergreen and NOL have gone quite far in providing extensive logistics solutions, other companies may not necessarily match up by adding extra logistics functions. This recommendation is reinforced by shippers’ low priority placed on service providers’ ability to provide customized logistics services. Resources could be better deployed to strengthen a firm’s capability in improving those service attributes valued by shippers like accurate documentation. It is clear that shippers prefer lower-cost solutions for a given level of service quality. Hence, addressing competitive and flexible pricing may be more viable than stepping into a new logistics territory.

Unnecessary fixed asset investment can be avoided by understanding shippers' expectations. As revealed by the survey results, presence of local office and ability to handle special products were not as important as other service attributes. Also, a good geographical coverage was not that crucial as compared to what was perceived by maritime firms. Hence, heavy investment on facilities and equipment in enhancing such logistics capability must be thoroughly considered.

When assessing whether to enter new frontiers, the external factors are as important as internal expertise and resources within the shipping companies. Some of the external factors to be considered include competition from rival shipping companies and third-party logistics providers, hinterland connectivity of the region, governmental support and regulations, and policies regarding certain kinds of logistics business. Thus, maritime firms have to evaluate both internal and external factors for devising their logistics strategy.

There are smaller maritime firms which do not have the level of resources and financial strength possessed by the top market players. Due to this limitation, they will be jeopardised if they compete directly with mega companies. When those mega carriers move towards higher level of logistics capability, smaller players do not always have to follow the same strategy. In fact, if they blindly follow the trend, they will find themselves insufficiently equipped and it is hard to achieve sustainability in market shares and profits. Instead, the smaller firms play a role in offering regional coverage and serving niche markets. In many cases, their customers are not global manufacturers or cargo owners who require highly integrated solutions. Therefore, one strategy could be to maintain as a traditional sea carrier offering basic sea transportation service. These market players usually target regional direct shipping services and feeder services. Their service scope is narrower and more basic than mega carriers. In this sense, their business focus would be on providing competent sea transportation service in a cost efficient manner.

For those smaller firms which see the necessity in offering logistics services, we recommend partnerships by pooling resources and fully utilising the resources in an effective and efficient way. Based on this approach, some of the smaller shipping companies can work together in terms of provision of logistics services through joint ventures such as in inland transportation services. With a certain degree of coordination, this would reduce overlapping of geographical coverage. However, the disadvantage might be more time spent on coordination and sharing of customer information to a certain degree.

The above suggestions are not exhaustive and absolute due to different situations and changing industry environment. A cost and benefit analysis has to be performed before deciding to launch a strategic decision.

## **6. CONCLUSIONS AND FUTURE RESEARCH DIRECTION**

By empirical investigation of logistics and value-added services provided by the world's top thirty shipping lines and their affiliated logistics service providers, we found that the major maritime companies are in line with shippers' requirements in terms of the type of logistics functions offered. However, perceptual differences between shippers and shipping firms exist with regards to logistics service attributes, especially on price-related attributes. It is necessary for maritime firms to better understand the needs of their customer base and adjust their logistics capability in an effective manner in order to enhance their competitive advantage in this turbulent market.

While the research has drawn some useful insights and recommendations for maritime firms, logistics service providers and shippers, it is bounded by certain limitations. Firstly, the survey data was cross-sectional in nature. Situations and opinions were captured during the period of economic recession. Research findings may not be representative in explaining other economic conditions. Secondly, the respondents from shippers and maritime firms in the sample were largely based in Singapore. Although Singapore is home to global shippers and all the respondent companies were involved in global business, external validity of the research can be enhanced if a more global response can be obtained. Thirdly, this is a generic study without differentiating the user industry sectors such as electronics and chemicals. It would be interesting to know the differences in logistics requirements in various industry sectors. These gaps present opportunities for research work that can be undertaken in the future.

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