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Logistics Capability, Information Technology, and Innovation Capability of Logistics Service Providers: Empirical Evidence from East Coast Malaysia

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ABSTRACT

The growth and transformation of the manufacturing sector all around the world has spurred on the demand for logistics services. These industries need logistics as the mobility medium to run the business process especially for road logistics transportation. The road logistics transportation is a key role to move goods from suppliers to customers in order to complete the logistics cycle. This situation has sparked congestion, which has caused delivery delay and rising costs. These two major effects of congestion have affected the business performance, for either the logistics service providers (LSPs) or the consignees. Thus, the purpose of this paper is to empirically examine the relationships of logistics capability, IT implementation, and innovation capability with the LSPs' performance. Using the correlation and standard multiple regression analysis, the theoretical models and hypotheses in this study are tested based on empirical data gathered from 81 LSPs in the East Coast region registered with the Federation of Malaysian Manufacturers directory of Malaysian industries. The results reveal that logistics capability, IT implementation, and innovation capability have significant positive relationships with the LSPs' performance. Among them, innovation capability contributes the most to the logistics performance in the East Coast region. This study has bridged the literature gap by providing empirical evidence and new insights on logistics performance using the Malaysian sample.

Keywords: Information Technology, Innovation Capability, Logistics Capability, Performance
JEL Classifications: L1, N7

1. INTRODUCTION

Manufacturing has emerged as the driving force of the present world. The United Kingdom is perceived to be the pioneer of industrial revolutions, followed by Germany, and the United States. During the first and second industrial revolution, the British firstly, introduced the textile industry followed by diverse others (Schmenner, 2001). In terms of Malaysia, the innovation-led economy started a bit later during the 1990s (Hasnan et al., 2014). The economic transformation of Malaysia from an agriculture-based economy has been successful because of the manufacturing sector that lifted the gross domestic product (GDP) to 33.1% in 1995 (Bank Negara Malaysia, 2003) and to date, its contribution continues consistently (Salina, 2004). The manufacturing sector acts as a catalyst for trading activities globally. In the context of Malaysia, exports of manufactured goods had escalated from MYR413 billion to MYR461 billion, while imports of manufactured goods had hiked from MYR359 billion to MYR430.5 billion in 2009. This exhibits an expansion of export and import related activities that have increased to 20% (MITI, 2010). It is predicted that the total export and import trade would further increase to MYR2.8 trillion in the near future (MITI, 2012).

Mobility, on the other hand, is a basic necessity for movement in any sector. For the purpose of the present study, mobility is perceived as Logistics. According to Coyle (1996), "Logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of raw materials, in-process inventory, finished goods, services and related information from point of origin to point of consumption (including inbound, outbound, internal, and external movements) for the purpose of conforming to customer requirements." Therefore, logistics

play a vital role in both local and overseas transfers, and act as the backbone in the movement of manufactured goods from one place to another until they reach their final destinations. Goods move by employing various logistics transportation systems, such as rail, air, sea, and road transportation. Among the mentioned, road transportation caters to all types of goods transportation as they are transited from land to sea, or from land to air, or from land to rail and vice versa, before finally reaching their respective destinations.

Therefore, acknowledging the significance of logistics in supporting the manufacturing sector as a whole, the logistics sector has been quoted in the third industrial master plan as an engine for growth that is required in order to increase the GDP by approximately 10% by the year 2020 (MITI, 2009). Furthermore, logistics is one of the most important elements in regards to the service sector as well, which is highlighted by the National Key Economic Areas for its contribution of 55% towards the GDP in 2008 (MIDA, 2012). The industrial trade and industry ministry revealed that the service sector will be a major contributor towards Malaysia's economy as it is expected to contribute approximately 60% to the GDP by 2020 (MITI, 2014). It could be deduced that both manufacturing and logistics sectors work jointly to cater to the economic development of a country, particularly in the case of road transportation logistics. A prominent example could be Beijing, where, according to the National Bureau of Statistics 2011, out of 27,806.3 million tons of total freight traffic, more than 76% of cargo travels by road, 11.9% by rail, and the rest at 11.4% travel by water (Mahpula et al., 2013). This proves that road transportation logistics is significant in completing the complete cycle of the logistics processes.

However, every success has its own share of shortcomings. The increased road traffic volume has produced unwanted consequences in certain countries, such as, road congestion. China (Speece and Kawahara, 1995), USA (Trunick, 2004), and UK are among the countries that are most affected by road congestions that have led to delay in delivery processes, cost increments, exposure to the risk of accidents, and customer dissatisfaction (McKinnon et al., 2009). Similarly, in Malaysia, the East Coast region of the country has reported confronting congestion issues, specifically in Kemaman and Kuantan (Zuraimi et al., 2012) and some other metropolitan areas (Almselati et al., 2011). Logistics firms located in the affected areas have claimed that their business have been affected by the recent congestion, especially during peak hours (Zuraimi et al., 2012). According to Hartgen (2007), the business community lost about 20.3% of receiving and delivering goods due to congestion. This means that congestion delays delivery time and thereby negatively affects business control. Moreover, it has been reported that congestion has caused associated costs, such as the cost of administration and transportation cost of both exporters and importers, to increase by 71.5% and 65.7%, respectively (Zhang and Figliozzi, 2010). The seriousness of the problem has been such that even off-peak deliveries that were once a trend in order to reduce congestion are no longer effective, as most consignees are unable to alter the workers' schedule, pay added insurance and operational costs, and manage security concerns associated with off-peak deliveries (Trunick, 2004). Such a high percentage of cost increment linked to the congestion problem in the logistics sector reflects the underlying issues that require immediate research attention.

Therefore, in response to the call, the objective of this study has been set to deliver a model that could be efficiently and effectively implemented to reduce operations cost and delivery time of logistics firms. Additionally, the model should also include elements of competitive advantage embedded within, which should support the logistics service providers (LSPs) to sustain the present dynamic market. Based on the existing literature, this study believes that the combination of the proposed constructs could help LSPs to sustain their performance by reducing operational costs and delivery delay, by means of enhancing logistics capability, implementing IT, and adapting innovation capability. According to previous literature, logistics capability (Lai, 2004; Shang and Marlow, 2005), IT implementation (Langley et al., 2007; Lai et al., 2008; Qiang and Xiande, 2008; Evangelista et al., 2012), and innovation capability (Hult et al., 2004; Yang, 2012) have significant positive relationships with the LSP firms' performance. Since the existing literature reports that the East Coast of Malaysia suffers most from the problem of congestion, this study therefore attempts to investigate the relationships of logistics capability, IT implementation, and innovation capability with firm performance in the Eastern region of Peninsular Malaysia.

2. THEORIES AND HYPOTHESES

2.1. The Resource-based View (RBV) Theory

RBV and firm competitiveness are a team. The essence of RBV is that firms can gain and sustain competitive advantages by emerging and deploying valuable capabilities and resources (Wernerfelt, 1984). According to RBV, core capabilities are normally identified from firms' resources and capabilities. In RBV, resources and capabilities are the major structures of the theory (Barney, 1991). Grant (1991) added that resources and capabilities are considered fundamental inputs for an organization. LSP firms are also in the league since the main business of LSPs is serving customers with a variety of resources such as transportation, delivery, warehousing, and so forth. Therefore, its performance relies greatly on the capabilities of the LSPs to deliver the services with all the resources (Karia and Wong, 2013). Furthermore, RBV argues that the uniqueness of the resources employed among logistics firms determines the level of competitive edge in a particular marketplace. Two LSPs will never retain exactly similar organizational routines and/or capability levels. This explains why the RBV is a popular choice in terms of theory within the logistics literature. The viewpoint of RBV includes inspecting the different types of capabilities and resources in order to understand the concept of logistics performance (Karia and Wong, 2013; Olavarrieta and Ellinger, 1997; Skjoett-Larsen, 1999). Using this as the base, a number of logistics studies investigating the impacts of LSPs' resources and capability on their performance has been developed, as it has been well established that both are essential prerequisites for competitive advantage (Karia and Wong, 2013).

2.2. Logistics Capability and Firm Performance

Logistics service capability could be perceived as the ability of logistics firms to create and deploy resources in order to provide satisfaction to their customers and thereby enhance service performance (Lai, 2004). Timely response to request, on-time service delivery, ability to solve problems, assisting customers to accomplish their own objectives and accurately storing and delivering information are among the major logistics capabilities of an LSP. It is expected that effectively accomplishing these services would satisfy customer needs leading to the superior performance of LSPs (Leuthesser and Kohli, 1995); thereby, establishing that logistics capability is the backbone of any LSP (Hafeez et al., 2002; Prahalad and Hamel, 1990; Tampoe, 1994; Yang et al., 2009).

Perhaps this is why, LSPs in developed countries such as the USA, consider issues related to on-time delivery, total order cycle time, accuracy of inventory, backorders and fill rates rather seriously (McMullan, 1996). Neighbouring country Singapore is another example of a Tier 1 logistics country that is highly concerned about its logistics services. Most of the logistics firms in Singapore focus on consistency and reliability in terms of delivery time, good service design and performance, special request for low cost operation, flexibility in accommodating sudden changes, and maximum value addition to services provided to customers aimed at satisfying their needs (Sum and Teo, 1999).

On the other hand, developing countries, such as China, are better at solving customer problems by putting immense effort in assisting them in cases of emergency, or helping them in solving cargo transportation problems, or by providing them pre-alert notice for every delivery and delivery related issues, thereby showing their sincerity and sensitivity towards their customers (Chin et al., 2007). Similarly, Taiwan has also identified flexible operation, innovation and logistics, economic scale, knowledge ability, and customer feedback as vital key factors for their LSPs. It seems that both China and Taiwan agree that capabilities contribute highly towards the international distribution centre and play significant roles to enhance the LSPs' performance. In the case of Malaysia, most logistics customers in the country are satisfied with the services offered by LSPs. The logistics firms in the country are known to care about the needs of their customers help them in emergencies, provide flexible service operations in order to avoid problems, respond to customers' requests in a positive manner, and handle customer complaints sincerely (Zuraimi et al., 2012).

Empirically, several studies have claimed that there is a significant relationship between capability and firm performance (Barnett et al., 1994; Hafeez et al., 2002; Huselid et al., 1997; Lai and Cheng, 2004; Ray et al., 2004; Shang and Marlow, 2005). According to Yang (2012), service capability and flexibility capability of LSPs significantly affect their performance. Additionally, Yang et al. (2009) supported completely that service capability has a positive and significant relationship with the performance of logistics firms. The findings are in line with the RBV theory, which stresses that capability is the most important element among other competitive factors that could help firms gain and sustain a competitive edge (Liu et al., 2010). Therefore, considering the aforementioned based on existing literature, the present study retains the following hypothesis:

H_1: Logistics capability has a significant positive relationship with firm performance.

2.3. IT Implementation and Firm Performance

Since IT plays the role of a conduit globally, its implementation presently is compulsory for traders particularly for businesses involved in the import and export trade. The sharing of information and IT develops the information-based capability, which is found to boost the performance related to distribution, leading to the success of a supply chain and thereby facilitating the integration of logistics (Chopra and Meindl, 2001; Shang and Marlow, 2005; Stenger et al., 1993; Williams et al., 1997). The motive behind the adoption of IT by leading edge firms lies in its ability to act as a catalyst to reduce cost and improve services, thereby significantly influencing the competency of the overall logistics (Burgess, 1998; Closs et al., 1997; Shang and Marlow, 2005).

Developed Western countries such as Germany and the USA use IT extensively in their logistics operations, and therefore are regarded as the most advanced players in logistics. Similarly, developed Asian countries, such as Singapore, also enjoy the advantages of IT as more and more of their logistics operators are pledging to integrate IT systems into their organizational operations. By implementing IT, they are able to utilize innovative technologies, thus obtaining new skills and knowledge in order to champion the newly acquired technologies. Therefore, it could be forwarded that IT is actually an effective medium for firms to be more successful in their business by enabling different organizations to focus more on their specific industry (Piplani et al., 2004). IT is a significant contributor for enhanced operation capabilities and should be implemented by the Malaysian logistics industry to attain higher values of customer service and product quality, following the successful neighbour, Singapore, similarly targeting to be the logistics hub for Asia Pacific (Sum and Teo, 1999).

Interestingly, developing nations, such as China and Malaysia, place enormous effort in implementing IT to be in the same league as their developed counterparts. Tiong Nam, for example, the biggest trucking company in Malaysia, has integrated IT within its trucking and business operations in order to be more effective in providing services by means of decreasing the unloading and loading time. Additionally, IT has enabled Tiong Nam to expand their operations abroad, thereby synchronizing with the current international markets (Sullivant, 2013). Unfortunately, majority of local LSPs in the Northern Region of Malaysia are not able to operate internationally due to the lack of capital investment, IT capabilities, and global networking (Thong, 2007). In the case of China, it is revealed that LSPs improve their operations by implementing IT values, either in terms of basic or advanced technologies. However, according to a survey among 177 LSPs in China, it was found that only a few firms were capable of implementing advanced IT systems, perhaps because majority of these services provides are small to medium sized firms with very limited resources (Chin et al., 2007). In the present era, IT services are also promoted in less-developed nations in order to

sustain the wide range of ICT products, which have been known to cause rapid development (Chadee and Pang, 2008). Under such a reality, it is evident that IT really changes the business environment by providing reliable, timely, and most significantly, accurate information. This in turn directly improves the supply chain performance, including logistics activities (Li et al., 2009).

Therefore in view of the above, it could be undoubtedly perceived that IT implementation is a key element that critically influences contemporary LSPs (Evangelista et al., 2012). Recently, several empirical studies have linked the involvement of IT in firms and its beneficial output with the logistics providers' performance (Qiang and Xiande, 2008). Particularly, in a related research focusing on transportation logistics in the context of the European Union, it has been found that IT implementation has successfully increased market share and boosted the sales growth of LSPs or third party logistics, thereby exhibiting a significantly positive relationship between the implementation of IT and firm performance. Consequently, a recent research also upheld that IT adoption positively influences performance effectiveness and efficiency of LSPs (Evangelista et al., 2012). The findings are in line with previous literature where it has been claimed that IT implementation should result in process quality enhancement, customer service improvement, and productivity increment (Bowersox and Daugherty, 1995; Calder and Marr, 1998; Chow et al., 2007; James et al., 2004; Lau et al., 2006; Liu et al., 2010). Therefore, the present study posits the following hypothesis:

H_2: IT implementation has a significant positive effect on the performance of LSPs.

2.4. Innovation Capability and Firm Performance

Innovation could be understood as enhancement in terms of production or processes related to the final output of a product or service by means of using creativity and capability. According to Bentz (1997), innovation is the presentation of improved or new products, processes or services, for the marketplace. Similarly, according to Afuah (1998), innovation refers to the practice of adapting new knowledge and technologies in order to create innovative services or products. On the other hand, innovation is also perceived as the process of transforming new opportunities into innovative ideas by exploiting IT extensively (Tidd et al., 1997). Moreover, Lawson and Samson (2001) claimed that innovation capability is the capability of firms to constantly transform fresh knowledge into new processes, products and systems in order to realize the benefits. In other words, this means, innovation capability is a key factor that enables firms to employ resources in newer ways that would generate improved values (Yang, 2012).

Damanpour (1987) and Tuominen and Hyvönen (2004), in (Yang, 2012), stressed that innovation can be divided into administrative and technological innovation. Technological innovation is concerned with new services, products, and technologies, whereas administrative innovation focuses on new policies, procedures, and forms of organization. Although previous literature mentions other types of innovation, such as, radical or incremental and product or process innovation, they are found to be rarely used (Cooper, 1998). The combination of administrative and technological innovation is perceived to cover a major portion of firms' innovation capability and is therefore considered for the present study. Technological innovation capabilities enable an organization to produce new processes or products (Yang, 2012), while administrative innovation capabilities focus on the ability of the administration in motivating the employees of a firm by means of rewards, for their commitment and creativity. This encouragement by the management indirectly motivates employees to be more creative in executing their daily tasks (Panayides, 2006). However, it needs to be noted that the organization's climate, culture, and structure also influence the administrative innovation capability. In regards to the combination of these two dimensions of innovation capability, it can be expressed that the innovation capability for this study focuses on improving specific goals on existing processes, products, or systems, which are expected to cause superior firm performance, where managers need to constantly be concerned about such capability to achieve the desired performance (Tok, 2007).

Related to this issue, Richey et al., (2005) confirmed that firm capability need to be dynamic, timely updated and should be able to fulfil customer needs. Therefore, the firms must constantly improve their capabilities (Mahoney, 1995). This is only achievable if the firm has innovativeness embedded within its business management, which ultimately leads to superior firm performance (Calantone et al., 2002). A recent study (Yang, 2012) proves that a firm is able to attain the highest level of overall performance only if the firm has high levels of innovativeness and customer responsiveness implied within their operations. Meanwhile, other related studies have claimed that technological profiles along with innovation capability are the two important resources to accomplish competitive advantages for a firm (Yeoh and Roth, 1999). Accordingly, Richey et al. (2005) added that proactive innovations can result in effectiveness and efficiency of marketplace competitive advantage, translating to superior financial performance of firms. Thus, empirical evidences forward that innovation capability eventually has a positive and significant effect on firm performance (Hult et al., 2004; Oke et al., 2007; Panayides, 2006), and therefore, this study puts forth the following hypothesis:

H_3: Innovation capability has a significant positive relationship with the performance of LSPs.

2.5. Performance of LSPs

Superior performance is a goal common to each and every firm in the world, and LSPs are no different. Performance is the behavioural quality and character of an organization in accomplishing its functions and jobs to gain profit (Sink, 1991). Performance could be defined by two core dimensions: Financial and non-financial (operational) performance (Bagorogoza and de Waal, 2010; Bakar and Ahmad, 2010; Darroch, 2005; Venkatraman and Ramanujam, 1986). Generally, operational performance measures the firm's performance in terms of its quality, flexibility, and on time delivery (Wang et al., 2010). According, to certain scholars, operational performance could be further divided into two dimensions, namely, service and cost performance (Huo et al.,

2008). Cost performance concerns price and costs related to the firm, whereas service performance focuses on flexibility, quality, and on-time delivery of services offered by a firm (Bernardes and Hanna, 2009; Daugherty et al., 2009; Green et al. 2008; Ketokivi and Schroeder, 2004; Neely et al., 1995; Ruamsook et al., 2009).

On the other hand, Dehler (2001. p. 208) in (Deepen, 2007) argued that logistics performance is basically built on two major dimensions, logistics cost and the level of logistics service. Logistics cost represents the total costs involved in providing respective logistics services while the level of logistics services relate to the capabilities required of a firm to deliver reliable and flexible products in a timely manner to customers that matches the dynamic demands of the marketplace. According to Krauth et al., (2005), effectiveness and efficiency are important for measuring performance. The balance of service and cost has been found to be a contributory factor for efficient and effective logistics performance and this is why service and cost performance are labelled as the two most important dimensions in measuring road transportation logistics performance. Previous literature lists three indicators for efficiency consisting of the "total distribution cost decrease, total delivery cost decrease, and employees' overtime hours decrease," while three other indicators have been found to represent the effectiveness of road transportation logistics namely "on-time delivery performance increase, number of delivery per day increase, and total loading capacity increase" (Krauth et al., 2005). Hence, critically considering the existing literature related to operational performance, the present study operationalizes and measures the construct following the work of Huo et al. (2008) and Krauth et al. (2005).

To serve the purpose of this study, an adapted model has been forwarded based on the critical review of the existing relevant literature. To reach the study objectives, four constructs represented by seven dimensions have been selected to reflect the efficiency and effectiveness of road transportation logistics performance in the East Coast region of Peninsular Malaysia. As already stated the efficiency and effectiveness of performance is an outcome of a balanced service and cost matrix. Therefore, this study conceptualizes the performance of logistics service providing firms by means of two dimensions, efficiency and effectiveness. Meanwhile, the first independent variable, which is firm capability, is characterized by two dimensions, flexibility capability and service capability. The other independent variable, IT implementation, is represented by basic technologies and advanced technologies and lastly, innovation capability has been denoted by managerial or administrative innovation.

3. RESEARCH METHODOLOGY

The sample frame includes the LSP firms registered with the Federation of Malaysian Manufacturers (FMM) that actively operate in the road logistics transportation sector. Initially, 240 LSP firms were identified from the FMM Directory of Malaysian Industries 2013 (Manufacturers, 2013) that could be used as respondents for this study. From there, 30 firms were used for the pilot survey, and the remaining 210 firms were targeted for the actual survey. The 210 firms were then approached through mail.

For the purpose of this study, Tabachnick and Fidell's (2012) rule for sample size has been followed. According to the rule, a census for a small population has been adapted, whereby the entire population is treated as the sample since the population of the study is small. For example, the population of this study is only 240 firms; therefore, all 240 of the population can be used as the sample.

In the case of this study, data was collected over a period of 3 months, conducting the actual survey (followed up by a series of phone calls and e-mail reminders). Only 93 out of 210 questionnaires were returned, and only 81 were usable. The rest of the 7 sets of questionnaires were eliminated because most of the questions were left unanswered and 4 were totally blank as certain firms refused to provide cooperation for this study. According to calculations, the percentage of the response rate for this study is 38.57%. The response rate could be considered high since Mohamed (1998) mentions that in the Malaysian context, 15-25% of response rate could be considered appropriate and acceptable. Even though the 81 valid responses seem small, it is sufficient for this study, following Tabachnick and Fidell's (2012) rule for a small population study. To verify this sample size, GPower analysis was carried out. The GPower application was developed as a stand-alone power analysis tool for statistical tests commonly used in behavioural and social research. By following Cohen (1992) to use a medium effect size, $f^2 = 0.15$ and α criterion = 0.05, the total sample size generated by the GPower was 79. Therefore, the total of 81 responses for this study is considered statistically sufficient.

3.1. Instrument and Measurement

To meet the research objectives, this study needed to collect information about the performance measures of LSPs in the East Coast region of Malaysia, which includes three states, namely Pahang, Kelantan, and Terengganu. Therefore, in order to gather data directly from the LSPs, a set of constructed questionnaire was distributed to the respondents, where the questionnaires are used to obtain reliable and accurate information, since a primary data collection method was employed for this quantitative study. Leaning on previous logistics capability and logistics performance studies, the questionnaire adapted a multi-item scale, which was modified accordingly to suit the context of the study. All the variables have been measured using a five-point Likert Scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree).

3.1.1. Logistics performance

Logistics performance is influenced by a combination of two inputs: On one hand, it is the performance of logistics processes outsourced to third parties, and on the other hand, it is the performance of the logistics processes still performed in-house by the firms. Going deeper, Dehler (2001) in the book authored by Deepen (2007) argued that logistics performance consists of two elements, logistics costs and logistics services. He added that logistics services include capabilities to supply the customers timely, reliably, and flexibly with qualitatively immaculate products that suit the demand of the market, while, logistics costs comprise all costs incurred in order to provide the chosen level of logistics services. Moreover, it is important to measure the logistics ability in order to accommodate

and satisfy customers (La Londe et al., 1988; Daugherty et al., 1992; Harding, 1998). Related studies proved that cost, quality, time, and flexibility are four components that influence customers to choose the LSPs (Neely et al., 1995). Accordingly, Krauth et al. (2005) measured logistics performance by deploying four indicators, which are efficiency, effectiveness, satisfaction, as well as IT, and innovation. Building up on existing literature, this study assumes that effectiveness and efficiency sum up the performance criteria needed to answer the research questions. Thus, based on Krauth et al. (2005), this study deployed the two dimensions of logistics performance, with three items that describe each of them: (1) Effectiveness is described by "on-time delivery performance increase," "number of delivery per day increase," and "total loading capacity increase," and (2) efficiency is measured by "total distribution cost decrease," "total delivery cost decrease," and "employees' overtime hours decrease." The Cronbach's alpha for the logistics performance is found to be 0.835.

3.1.2. Logistics capability

For this study, logistics capability is reflected by means of two dimensions, service capability and flexibility capability. Each dimension is measured by three and four items, respectively. Service capability is measured based on on-time delivery, goods' protection from damage, and tracing service system. As for flexibility capability, it is represented by accommodating non-routine special customer request, handle unexpected events, flexible operational procedures, and handle reverse logistics operations. All these items are adopted from Huang and Huang (2012), Zuraimi et al. (2012), and Zuraimi et al., (2013). Holistically, logistics capability achieved the Cronbach's alpha value of 0.918.

3.1.3. IT implementation

IT implementation is conceptualized by two dimensions, which are basic technology and advanced technology. Basic technology is represented by internet access and wide computer usage. Meanwhile, Global Positioning System solution, electronic data interchange solution, enterprise resource planning solution, and radio frequency identification represent advanced technology (Banomyong and Supatn, 2011; Evangelista et al., 2012; Li et al., 2009). This variable obtained the Cronbach's alpha value of 0.940.

3.1.4. Innovation capability

Unlike other constructs, innovation capability is only represented by administrative innovation since this study measures the innovation capacity for administrative only, in order to avoid redundancy with the technical innovation, as in logistics capability. Therefore, the administrative innovation is measured by four items, namely improve firm's operational system, exploring newer service, explore best method to achieve corporate goals and reward employees for their innovative idea (Yang, 2012; Yang et al., 2009). For internal consistency, innovation capability obtained the Cronbach's alpha value of 0.963.

4. SUMMARY OF FINDINGS

4.1. Logistics Capability and Logistics Performance

From the Pearson correlation analysis (as noted in Table 1), it has been found that the relationship of logistics capability and firm performance obtained Pearson product-moment coefficient, r = 0.419 and correlation is significant at P = 0.01, where statistical significance at the traditional level is P <0.05. Since r = 0.419, it could be concluded that the capability of the LSPs and firm performance have a positive medium correlation, with the increase of LSPs capabilities associated with the increase in firm performance.

4.2. IT Implementation and Logistics Performance

From the correlation analysis on both variables, the correlation of IT implementation and firm performance only obtained r = 0.284 and P = 0.01 with n = 81 (as noted in Table 2). Since the value of r is considered small, it could be concluded that IT implementation and firm performance have a weak positive relationship, with 0.01 significance. Therefore, the increase in IT implementation could be associated with the increase in firm performance.

4.3. Innovation Capability and Logistics Performance

Based on the result in Table 3, the correlation of innovation capability and firm performance obtained is r = 0.476 and P = 0.01. Referring

Table 1: Pearson correlation-logistics capability and firm performance

Details of correlation analysis	Capability of LSPs	Firm performance
Logistics capability		
Pearson correlation	1	0.419**
Significant (one-tailed)		0.000
N	81	81
Firm performance		
Pearson correlation	0.419**	1
Significant (one-tailed)	0.000	
N	81	81

**Correlation is significant at the 0.01 level (one-tailed). LSP: Logistics service provider

Table 2: Pearson correlation - IT implementation and firm performance

Details of correlation analysis	IT implementation	Firm performance
IT implementations		
Pearson correlation	1	0.284*
Significant (one-tailed)		0.010
N	81	81
Firm performance		
Pearson correlation	0.284*	1
Significant (one-tailed)	0.010	
N	81	81

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

Table 3: Pearson correlation-innovation capability and firm performance

Details of correlation analysis	Innovation capability	Firm performance
Innovation capability		
Pearson correlation	1	0.476**
Significant (one-tailed)		0.000
N	81	81
Firm performance		
Pearson correlation	0.476**	1
Significant (one-tailed)	0.000	
N	81	81

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

to the r value, innovation capability and firm performance have a medium positive relationship. Hence, the increase in innovation capability could be associated with the increase in firm performance.

4.4. Multiple Regression Analysis

From Table 4, it is found that the value of r square is 0.296. Therefore, 29.6% of the performance of LSPs, as the dependent variable is explained by the model.

In order to access the statistical significance of the result, ANOVA table in Table 5 is referred. This tests the null hypothesis that multiple R in the population is equal to 0. The ANOVA table shows the significance of this model with P equivalent to 0.001. Following Pallant (2010), the model is said to reach its statistical significance if it is $P < 0.005$. Therefore, since the significance of this model is 0.001, which is <0.005, this model is statistically significant.

Next, the result discusses which independent variables involved in this model contributed to the prediction of the dependent variable. By looking at the values of beta in Table 6, innovation capability possesses the highest coefficient value (0.377), thus making it the strongest unique contribution explaining the performance of LSPs, followed by the capability of LSPs (0.29), and IT implementation (0.02), which has the weakest unique contribution to the performance of LSPs.

Furthermore, the significance of each independent variable is measured in order to see whether the particular variable makes a statistical significant unique contribution to the equation. The rule is the variable is said to have a significant unique contribution to the prediction of the dependent variable when $P < 0.05$ (Pallant, 2010). From the result, both the capabilities of the LSPs ($P = 0.012$) and innovation capability ($P = 0.001$) have a statistically significant unique contribution to the performance of LSPs. However, the P value of implementation of IT is larger than 0.05, making it a non-contributor to the equation. This probably happens due to the overlapping with other independent variables.

Last but not least, in order to get an indication of the contribution of the independent variables involved in this model to the total r square, the value of part correlation coefficient must be squared. This explains how much the total variance in the performance of LSPs is uniquely explained by the listed independent variables.

Contribution of capability of LSPs = Part correlation coefficient squared × 100
= (0.246 × 0.246) × 100
= 6.05%.

Contribution of innovation capability = Part correlation coefficient squared × 100
= (0.336 × 0.336) × 100
= 11.29%.

Thus, the innovation capability uniquely explains 11.29% of the variance in performance in LSPs, almost double the capability of LSPs, which uniquely explains 6.05% of the variance in the performance of LSPs. The shared implementation of IT is not calculated since the previous finding showed that an independent variable does not make a significant contribution to the equation. All in all, based on the results of the standard multiple regressions, it can be concluded that the capability of LSPs and innovation capability explains 17.34% (6.05% + 11.29%) of the variance in performance of LSPs. Of these two variables, innovation capability makes the largest unique contribution (Beta = 0.377), followed by the capability of LSPs (Beta = 0.29).

Table 4: Model summary of standard multiple regression

Model	R	R^2	Adjusted R^2	Standard error of the estimate
1	0.544[a]	0.296	0.268	0.60757

[a]Predictors: (Constant), capability of LSPs, innovation capability, IT implementation.
[b]Dependent variable: Firm performance

Table 5: ANOVA

Model	Sum of squares	df	Mean square	F	Significant
Regression	11.944	3	3.981	10.786	0.000[b]
Residual	28.424	77	0.369		
Total	40.369	80			

[a]Dependent variable: firm performance. [b]Predictors: (Constant), capability of LSPSs, IT implementation, innovation capability

5. DISCUSSION

According to the hypothesis, logistics capability has a positive and significant effect on the performance of logistics firms. This finding is in line with previous related studies, which display that the capabilities of LSPs significantly influence firm performance (Lai et al., 2004; Shang and Marlow, 2005; Zuraimi et al., 2012). Logistics capability is therefore considered one of the key factors that affect the competitiveness of a firm (Liu et al., 2010). Flexible capabilities and logistics service capabilities delivered by LSPs are not only vital for road transportation services but they are also significant for liner shipping services (Yang et al., 2009). Previous related study similarly found that on-time delivery services, assisting customers in accomplishing their own objectives, ability to solve problems, providing delivery information and accurate

Table 6: Regression analysis

Details of regression analysis	Standard coefficient			Correlations		
	Beta	t	Significant	Zero-order	Partial	Part
Constant		3.201	0.002			
Capability of LSPs	0.29	2.573	0.012	0.419	0.281	0.246
IT implementation	−0.02	−0.17	0.866	0.284	−0.019	−0.016
Innovation capability	0.377	3.511	0.001	0.476	0.372	0.336

LSP: Logistics service provider

storage, and timely response to customer requests are capabilities which concern both firms and customers alike (Panayides and So, 2005). Regardless of geographical location or cultural portfolio, capabilities of providing superior service to customers add a competitive edge to the LSPs' performance and perhaps this is why the findings for service capabilities in the present study is aligned with the previous related literature.

Next, this study also extends the current literature of IT implementation and firm performance. This proposed relationship provides two different results in two types of analyses, correlation and regression. In the correlation analysis, the result shows that IT has a weak positive relationship with firm performance. In contrast, the regression analysis found that IT implementation and firm performance has a negative and insignificant relationship. This is not a shocking result because studies on IT implementation always give varied outputs, despite the goodness of IT. This phenomenon is called the "productivity paradox" (Brown, 2003). The "productivity paradox" phenomenon has also been met by many other studies such as Weill (1992), Hitt and Brynjolfsson (1996), Lee and Barua (1999), and Devaraj and Kohli (2003).

Next, the finding of the relationship between innovation capability and firm performance also found that innovation capability has a significant positive relationship with firm performance. It is supported by other earlier studies such as Yeoh and Roth (1999), Calantone et al. (2002), Hult et al. (2004), Panayides (2006), Oke et al. (2007), and Yang (2012), which also confirmed empirically that innovation capability is important in enhancing firm performance and sustaining its competitive advantage. All in all, among all three variables that support the performance, innovation capability is the largest contributor, followed by the logistics capability. However, like some other countries, IT implementation in East Coast Malaysia is still unstable to fully influence the performance. The result suggests that the smaller size LSPs in East Coast make firms utilize IT less, due to less capital and small operations.

One major limitation faced by the present study is the constraint of resources. Additionally, the sample size of this study is relatively small (only 81 samples). This is because the geographic area of the study only involved three states, Pahang, Kelantan, and Terengganu. These states are not the centre for logistics activities such as the Klang Valley, Penang, or Johor, but are still important for the development of the East Coast Economic Region, which needs the constant support of logistics services in order to operate effectively and thereby deliver its contribution towards the economic growth of Malaysia. Moreover, due to the lack of awareness on academic research, the response rate in terms of the number of usable questionnaires, though sufficient, was not encouraging and this remains a major challenge to many researchers who conduct organizational studies in Malaysia. Thirdly, this study encountered some difficulties in finding previous related literature regarding the moderating effect of firm size on the logistics field, possibly because no such study has been conducted before in the field of logistics. Fortunately, other studies in the neighbouring management field helped the study to refer and integrate such literature with the present logistics study.

The empirical results of the present study contribute by extending the existing logistics literature. However, since the present study focused only on the logistics capability, future studies could further extend the literature by exploring other and capabilities resources of logistics firms, based on the RBV theory. Furthermore, future studies could further investigate the effect of a few other established moderating variables such as age of firm and type of industry to provide newer and deeper insights thereby extending the boundaries of conditions of logistics capabilities and their performances.

6. CONCLUSION

The rapid growth of the manufacturing industry in the whole world has boosted the demand for logistics services in order to cater to the movement of manufactured products. The most benefiting sector is the road transportation logistics that in turn somehow created unwanted road congestions as a by-product of its development, particularly affecting urban areas. The congested roads cause significant delays in the delivery of goods and products. It simultaneously increases the operation costs for logistics firms. Notable delays and cost increment negatively affects business performance of LSPs who are responsible for road logistics transportation operations. Therefore, in order to neutralize this situation, a research model is forwarded by the present study that could be employed by logistics firms to ensure continuous efficient, effective, and competitive performance. Based on prior relevant literature, logistics capabilities, IT implementation, and innovation capabilities are derived as key factors affecting superior firm performance, and thereby enabling firms to sustain competitive advantages in a dynamic market. Hence, this study will synthesize the relationships of firm capability, IT implementation, and innovation capability with performance of LSPs.

In any research, not all existing constructs from literature could be included in the model. For the purpose of this study, only few significant constructs are selected in regards to the issues highlighted. Thus, future researchers are invited to integrate other relevant and significant constructs in the present model in order to reveal a deeper understanding of determinants affecting the performance of logistics firms. Moreover, the model of the present study can be adopted or adapted into future empirical studies of related yet diverse research areas, especially in the Malaysian context, since logistics literature in the Malaysian context is still rudimentary.

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