

## Exporters' Strategic Orientation towards Third Party Logistics Suppliers: Impacts on Exporters' Logistics Competence and Export Performance

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**Abstract:** A firm's strategic orientation helps develop its capabilities that improve its performance. Collaboration with third party logistics (3PL) suppliers is a key to the success of firms exporting to international markets. There has been phenomenal growth in investment in 3PL services in the past decade. However, very little research has examined how exporters' strategic orientation towards 3PL suppliers helps improve their logistics competence and export performance. Drawing on the resource-based view of the firm and the relationship marketing perspective, we analyzed data from 150 exporters in Hong Kong and the Pearl River Delta (PRD) region, China, using structural equation modelling and obtained the following findings: (1) exporters' strategic orientation towards 3PL suppliers has a significant positive impact on 3PL suppliers' core and augmented capabilities, (2) 3PL suppliers' augmented capability has a significant positive impact on exporters' logistics competence, and (3) exporters' logistics competence has a significant positive impact on their own export performance. We also found that the impact of 3PL suppliers' core capability on exporters' logistics competence is positive but only marginally significant. This research contributes both to theory by identifying the performance implications of exporters' strategic orientation towards 3PL suppliers and to practice by providing exporters with insights on treating their 3PL suppliers.

**Keywords:** Third party logistics; structural equation modeling

### I. Introduction

With burgeoning global trade, fierce competition, higher customer expectations, and ever-expanding supply chains around the world, third party logistics (3PL) providers play an increasingly important role among manufacturers, suppliers, traders, and consumers. Despite the well-documented benefits and unprecedented growth of 3PL services, prior studies have also discovered that many 3PL relationships failed in the first two years. 3PL non-users lament that the expected cost reduction and the promised services by outsourcing logistics could not be realized. Many of them believe that they have more expertise in managing their logistics functions by themselves (Das and

Teng, 2000). These conflicting findings expose that there remain gaps in our understanding of the consequences of establishing 3PL relationships. Moreover, previous research has focused mainly on forming "either upstream integration or downstream integration ... and hence did not examine the specific form of the integration-performance relationship" (Vickery et al., 2003). The current literature does not adequately address the issues related to 3PL relationships and their performance implications (Prahinski and Benton, 2004). Therefore, this study extends the existing literature by studying the impacts of the 3PL provider-exporter relationship on the exporter's competence and its performance.

Collaboration works well when all the partners work together as a team and share ideas and information towards agreed objectives on a long-term basis (Stank et al., 1999). This joint effort must start at the top of each business (Sahay and Mohan, 2006) and be reflected in the firm's willingness to empower employees with resources to make appropriate and timely decisions. Yet, there remains a fundamental gap in our understanding of how exporters' strategic orientation towards 3PL suppliers affects the latter's capabilities, which in turn improve the former's performance (Prahinski and Benton, 2004). To the best of our knowledge, this is the first study to fill this gap. The tremendous growth in the use of 3PL providers suggests this is a prime research issue to address (Sinkovics and Roath, 2004). Within operations management, this study answers the calls by researchers to offer a better understanding of how to leverage the 3PL provider-user relationship to yield better performance (Sinkovics and Roath, 2004; Vivek et al., 2008). Specifically, we seek to address the following research questions:

1. How does exporters' strategic orientation towards 3PL suppliers affect the latter's capabilities?
2. How do 3PL suppliers' capabilities impact on exporters' logistics competence?
3. How does exporters' logistics competence influence their own export performance?

### II. BACKGROUND AND THEORETICAL DEVELOPMENT

Locating in the PRD region, Hong Kong is one of the busiest logistics hubs in the world (Lai et al., 2004). Hong Kong's economy is export-oriented with a small domestic market. Total merchandise trade amounted to US\$750 billion in 2008. In the import and export trade sector, over 518,000 people were employed by more than 96,000 trading firms. Most firms employed around 5 people on average. This sector accounts for 22.6% of Hong Kong's GDP in real terms. About 17% of the China's foreign trade was handled via Hong Kong and 62.5% of Hong Kong's total re-exports originated from the Chinese mainland (Quarterly Report of Employment and Vacancies Statistics, 2009). The Hong Kong government regards logistics as a pillar industry to enhance Hong Kong's strategic competitiveness.

Bask (2001) developed a 3PL service matrix to relate the complexity of the 3PL service provision and the type of relationship between user and provider. Three different types of service relationship can be distinguished: routine service, standard service, and customized service (Bask, 2001; Makelin and Vepsäläinen, 1990). Routine service means simple transportation services, using a single mode of transportation without other value-added services (Naim et al., 2006). The driver for routine service is economies of scale. The characteristics are competitive price, ease of service procurement, and arms-length relationship. Standard service provides some degree of customization. The range of its service is between routine service and customized service. Customized service aims to respond to the customer need faster and deliver greater logistics flexibility. The driver for customized service is economies of scope. Close partnerships, long-term commitment, and open information are often needed. Berglund et al. (1999) proposed two dimensions, namely standard logistics services and value-added logistics services, for the strategic segmentation of 3PL providers. Hertz and Alfredsson (2003) developed a two-type theoretical model, comprising (1) general problem-solving capability and (2) degree of customer adaptation. Stank et al. (2003) also developed a two-type theoretical model, which differentiates between operations performance and relational performance, to predict market share variance among 3PL providers. Based on the recent focus on the strategic behaviour of 3PL providers and common segmentation, we categorize the capabilities of 3PL providers into two dimensions, namely core capability and augmented capability. The core capability provides routine and necessary services such as on-time and reliable deliveries. The augmented capability provides additional services beyond the necessary functions. The additional services include one-stop service, providing creative solutions etc.

#### *Exporters' strategic orientation towards 3PL suppliers and 3PL suppliers' capabilities*

We postulate that exporters' strategic orientation towards 3PL suppliers is positively related to the latter's core capability and augmented capability. Based on RBV, we

argue that the supply systems and inter-organizational relationships that are not identical among 3PL providers and difficult for competitors to imitate are valuable in enhancing the overall capabilities of both 3PL providers and exporters (Wisner, 2003). Such rare resources enable exporters to generate above normal rates of return along with a sustainable competitive advantage in a given market, thus positively impacting on exporters' export performance. From the relationship marketing perspective, exporters' strategic orientation towards 3PL providers brings social and confidence benefits to both parties. Subsequently, mutual trust and essential information sharing enable 3PL suppliers to improve their core and augmented capabilities (Carr and Pearson, 1999; Nonaka and Takeuchi, 1995; Ragatz et al., 1997). Augmented capability is more important than core capability because the latter is only the order qualifier (Hill, 2000), which is necessary but not sufficient for sustaining long-term relationships. In order to develop long-term relationships with exporters, 3PL providers need to provide extra important benefits and exceed exporters' expectations. Therefore, we formulate two hypotheses characterizing the framework in which exporters' strategic orientation is an antecedent to 3PL suppliers' core capability and augmented capability as follows (Han et al., 1998):

Hypothesis H1: Exporters' strategic Orientation towards 3PL suppliers has a positive influence on the latter's core capability.

Hypothesis H2: Exporters' strategic orientation towards 3PL suppliers has a positive influence on the latter's augmented capability.

#### *3PL suppliers' capabilities and exporters' logistics competence*

The performance of a key product supplier directly influences a buyer's operations performance (Handfield et al., 2000). Similarly, 3PL suppliers have proved to be effective in helping firms to improve customer service, respond faster, and reduce overall logistics costs (Mikkola and Skjoett-Larsen, 2003). For core capability, 3PL suppliers need to provide timely, reliable, dependable, and satisfactory delivery. 3PL suppliers' core capability performs the necessary functions that exporters need. Firms can gain competitive advantage from the delivery process (Stank et al., 2003), particularly for those in the time-sensitive manufacturing, trading, and retail sectors. They rely on outside logistics specialists to deliver goods to customers so that they can focus on their own core businesses (Hum, 2000). For example, traditional international transportation by consolidated freight takes 12 days on average. Successful collaboration with global 3PL providers can cut the delivery lead time to two days (Poirier and Reiter, 1996). Therefore, we formulate the following hypothesis:

Hypothesis H3: 3PL suppliers' core capability has a positive influence on exporters' logistics competence.

Besides core capability, augmented capability is important for 3PL providers to be competitive on the market and provide values to their customers. Augmented capability includes providing creative solutions and one-stop service, improving customers' operations efficiency, and providing information technology services. Augmented capability can provide the following benefits: (1) higher customer loyalty, (2) higher customers' willingness to pay a premium price, and (3) higher ability to meet customers' requests (Stalk and Hout, 1990). Drawing on Berry (1995), service providers should develop a core service around which to build a customer relationship, customize the relationship to individual customers, and augment the core service with extra benefits. In addition to social benefit, customers expect to receive confidence and special treatment benefits under long-term relationships with their service providers (Gwinner et al., 1998). Therefore, we formulate the following hypothesis:

Hypothesis H4: 3PL suppliers' augmented capability has a positive influence on exporters' logistics competence.

#### *Exporters' logistics competence and export performance*

RBV suggests that a firm can create competitive advantage by accessing to the tangible (e.g., equipment, plants, fleets, hardware) and/or intangible (e.g., organizational processes, skills, know-how, reputation) resources of its suppliers, which in turn enhance its own business performance (Daugherty et al., 1996a; Lai et al., 2004; Murphy and Poist, 2000; Skjoett-Larsen, 1999). Many researchers have found that a firm can improve its business performance if it can reduce carrying costs, expedite container movements, track inventory and sales, and share information upstream and downstream (Li and Ogunmokun, 2001; Tyan et al., 2003). Guan and Ma (2003) found that a firm's export ratio can be improved if the lead time is cut and delivery is reliable. Christopher (2005) also found that logistics service has a positive causal impact on sales volume and customer retention. Superior logistics competence can strengthen customer loyalty, which in turn leads to greater sales, a larger market share (Stank et al., 2003), and higher profitability (Anderson et al., 1994) because "satisfied customers are more likely to place a greater proportion of their purchase with that supplier" (Christopher, 2005). Thus, we formulate our final hypothesis:

Hypothesis H5: Exporters' logistics competence has a positive influence on their own export performance. The conceptual model is in Figure 1.

### III. METHODS

Before we sent out the survey questionnaires, we conducted a pilot study with six firms, through which we verified the relevance of the measurement indicators to their corresponding constructs, appropriateness of the questionnaire wording, and clarity of the instructions to fill

in the survey. Upon completing the pilot study, we made minor modifications to the questionnaire in order to improve its validity and readability. Then we randomly selected 350 exporter firms from the lists compiled by the Hong Kong Trade Development Council (HKTDC). Through multiple contacts (invitation letters and telephone calls), we managed to contact logistics professionals (e.g., logistics managers) in a total of 334 firms. We identified 272 firms which have at least a dedicated 3PL provider in the past two years prior to our survey studies. We then invited them to join this study and sent out the survey questionnaires accordingly. For each company, we asked the logistics professionals to answer the questions on the company's strategic orientation towards 3PL suppliers and the 3PL suppliers' capabilities, and asked the senior executives to answer the questions on the company's logistics competence and export performance. This helps alleviate single respondent bias. Because of company policies of not responding to surveys of this nature, confidentiality of the information sought, or unavailability of senior executives to answer questions related performance, we obtained 158 responses. We dropped eight responses because some data from either the logistics professionals or senior executives were missing, leaving 150 usable returns, yielding an effective response rate of 55.1% (150 out of 272 sent out). Our response rate was general higher than those of previous studies as we had identified the appropriate logistics professionals before sending out our questionnaires and we could follow up our surveys directly with them. It is worthwhile to note that we sent the survey questionnaires to export companies that used 3PL providers, not 3PL providers. We assessed the non-response bias by a series of *t*-tests, which revealed no statistically significant differences between early responses and late responses (Armstrong and Overton, 1977).

We adopted the measures used in this study from well-established instruments in the supply chain management and operations management literature. All the survey questions use the seven-point Likert scale. We applied a rigorous process to develop and validate the survey instrument. Adopting a two-step method to test construct reliability (Narasimhan and Jayaram, 1998), we first used exploratory factor analysis (EFA) to ensure unidimensionality of the constructs, followed by using Cronbach's alphas to assess their reliability. The analysis shows that all the measures had a Cronbach's alpha of 0.7 or above, confirming their reliability (Nunnally 1978; Nunnally and Bernstein, 1994). In addition, we used the corrected item-total correlation (CITC) reliability test (Kerlinger, 1986). The analysis shows that all the CITC values were larger than 0.4, higher than the minimum acceptable value of 0.30. Based on the Cronbach's alpha values and CITC values, we concluded that the scales were reliable.

We conducted the EFA at the cross-factor level. We performed the principal component analysis with varimax

rotation with Kaiser normalization on all the measurement items to determine the main constructs and their related measurement items (Loehlin, 1998). The cross-factor level EFA resulted in five eigenvalues that were greater than 1. The scree test suggested that five factors were appropriate as the difference between the fifth largest eigenvalue (1.168) and the sixth largest eigenvalue (0.734) was significant. The total variance explained by the five factors was 69.4%. If an item is loaded on more than one factor and the difference between the factor loadings is less than 0.10 across the factors, then the item is considered as cross-loaded (Jambulingam et al., 2005, Kathuaia, 2000). The analysis shows that each item was well loaded on a single construct (i.e., no item was cross-loaded). Therefore, the factors extracted from EFA represent their corresponding items well.

#### IV. RESULTS

We followed Anderson and Gerbing's (1988) two-step approach to estimate a measurement model prior to creating a structural model. To test the fit of the models, we used LISREL 8.5 (Jöreskog and Sörbom, 2001) to perform structural equation modelling (SEM) based on the maximum likelihood methods, with the correlation matrix of the indicators as input. In what follows, we present the results of the measurement model analysis, structural model analysis, and hypothesis testing. We tested construct convergent and discriminant validity using confirmatory factor analysis (CFA) (O'Leary-Kelly and Vokurka, 1998) by entering all the indicators into the same measurement model (Patrick et al., 2007).

We assessed the convergent and discriminant validity of the scales using the method outlined in Fornell and Larcker (1981) and Chau (1997). For convergent validity test, we linked each item to its corresponding construct and estimated the covariance among the constructs freely. CFA found  $\chi^2_{(160, N=139)} = 229.58$ ,  $\chi^2/df = 1.43$ , nonnormed fit index (NNFI) = 0.93, comparative fit index (CFI) = 0.94, and root mean squared error of approximation (RMSEA) = 0.056. The  $\chi^2/df$  is a fit index that weights the  $\chi^2$  statistics by the degree of freedom, where a value of 1.43 suggests a good fit to the model (Hu and Bentler, 1999). All the absolute goodness of fit values were well above 0.90, which suggests a good fit between the implied covariance in the model and the observed covariance from the data. The comparative fit measures were also well above the thresholds, providing evidence against the null hypothesis. All these measures suggest that the measurement model had a good fit. Further, all the factor loadings had *t*-values larger than 2.0 and significant at  $p < 0.001$ , which confirms convergent validity (Anderson and Gerbing, 1988; Chau, 1997; Fornell and Larcker, 1981). Besides, all the constructs had eigenvalues exceeding 1.0 and all the factor loadings

exceeded the minimum value of 0.30, which provides further evidence of convergent validity of the constructs (Hair et al., 1995; Reines-Eudy, 2000).

We tested discriminant validity by fixing the correlation between any pair of related constructs at 1.0, prior to re-estimating the modified model (Chau 1997; Li et al., 2007). A significant difference in the chi-square statistics between the fixed and unconstrained models indicates high discriminant validity. For the five constructs, we conducted a total of 10 different discriminant validity checks. By fixing the correlation between any pair of related constructs in the measurement model to the perfect correlation of 1.0, the chi-square values increased from 35.47 to 682.39. With an increase in one degree of freedom, these chi-square values were highly significant at  $p = 0.01$  ( $\Delta\chi^2 \geq 6.635$ ). Therefore, discriminant validity was achieved.

We used a number of fit statistics to evaluate the model because no single measure is adequate (Bollen and Long, 1993; Shah and Goldstein, 2006). Browne and Cudeck (1993) recommended that an absolute RMSEA value of less than 0.05 suggests a good fit, and a RMSEA value between 0.05 and 0.08 indicates a reasonable fit. The RMSEA measures the sample discrepancy function value per degree of freedom. Other fit indices include normed fit index (NFI), nonnormed fit index (NNFI), and comparative fit index (CFI) (Shah and Goldstein, 2006). Hair et al. (1995) suggested that the model fit is good if NFI, NNFI, and CFI are above 0.9. While NFI does not adjust the sample discrepancy function by the degree of freedom, NNFI and CFI do. Table 1 shows the goodness-of-fit statistics for our hypothesized model. The overall fit of our structural model was good:  $\chi^2_{(165, N=139)} = 262.52$ ,  $\chi^2/df = 1.59$ , CFI = 0.93, NNFI = 0.92, and RMSEA = 0.062. All fit statistics were within the desirable ranges. We tested the hypothesized relationships using their associated *t*-statistics. The *t*-values  $> 1.98$  and 1.645 are considered to be significant at the 0.05 and 0.10 levels, respectively (Hair et al., 1995). The Q-plot for the structural model was approximately linear with a slope near 1, confirming that no major misspecifications had been made (Bagozzi and Yi, 1988; Bentler, 1990). Tables 2 show the hypothesized model and its path estimates and the results of hypothesis testing, respectively. Hypothesis H1 linking exporters' strategic orientation towards 3PL suppliers to 3PL suppliers' core capability was statistically significant and in the expected direction ( $b = 0.44$ ;  $p < 0.05$ ). Hypothesis H2 linking exporters' strategic orientation towards 3PL suppliers to 3PL suppliers' augmented capability was statistically significant and in the expected direction ( $b = 0.50$ ;  $p < 0.05$ ). However, hypothesis H3 proposing a relationship between 3PL suppliers' core capability and exporters' logistics competence was only marginally significant ( $b = 0.20$ ;  $p < 0.10$ ), although the sign of the coefficient was in the expected direction. Hypothesis H4 proposing a relationship between 3PL suppliers' augmented capability and exporters' logistics competence was supported ( $b = 0.53$ ;  $p$

< 0.05). Finally, hypothesis H5 linking exporters’ logistics competence to their own export performance was statistically significant and in the expected direction ( $b = 0.23$ ;  $p < 0.05$ ). These findings suggest that exporters’ strategic orientation towards 3PL suppliers is an important antecedent to 3PL suppliers’ capabilities, which in turn affects exporters’ logistics competence and export performance.

V. CONCLUSIONS

We used SEM fed with data from 158 exporters in Hong Kong to analyze the relationships among exporters’ strategic orientation towards 3PL suppliers, 3PL suppliers’ capabilities, exporters’ logistics competence, and exporters’ export performance. The SEM results show that (1) exporters’ strategic orientation towards 3PL suppliers has a significant positive impact on both 3PL suppliers’ core capability and augmented capability, (2) 3PL suppliers’

augmented capability has a significant positive influence on exporters’ logistics competence, and (3) exporters’ logistics competence has a significant positive impact on their own export performance. The results also show that the impact of 3PL suppliers’ core capability only has a marginally significant impact on exporters’ logistics competence. Our findings provide empirical evidence that a good combination of exporters’ resources and 3PL suppliers’ resources can enhance 3PL suppliers’ capabilities, which in turn improve exporters’ logistics competence and export performance. A good long-term relationship between exporters and 3PL providers can be a sustainable competitive advantage for both exporters and 3PL providers. According to relationship marketing theory, exporters’ strategic orientation towards 3PL suppliers can yield relational benefits to both exporters and 3PL providers.

**References:** available upon request

Figure 1: The conceptual model

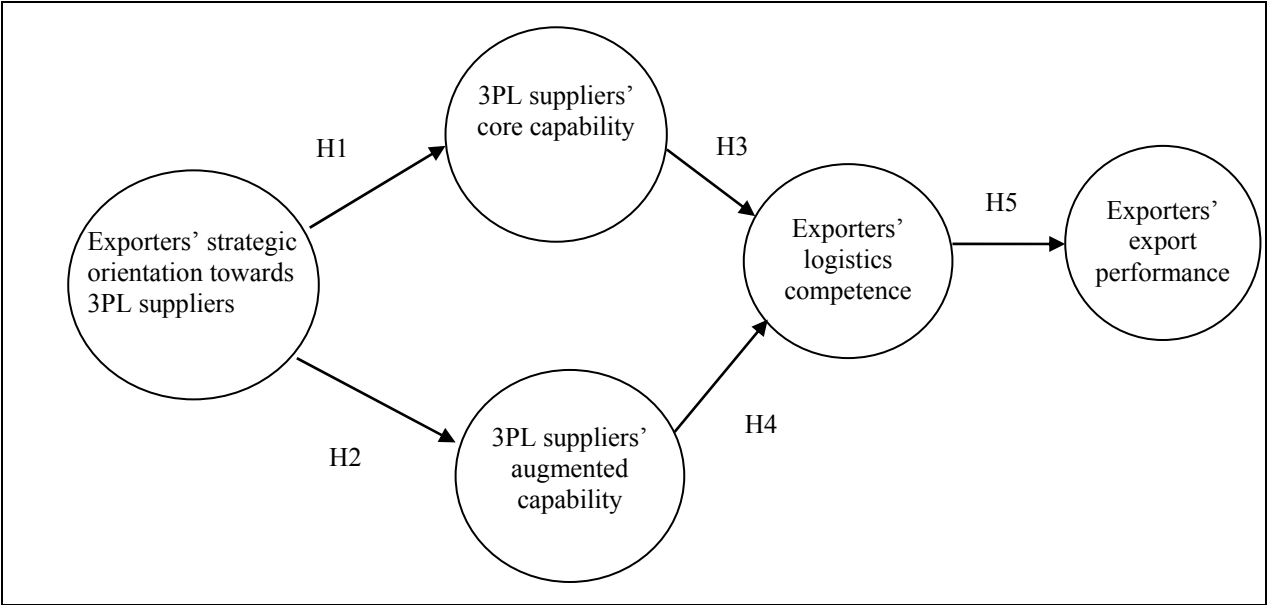


Table 1: Fit measures of the overall model.

Goodness of Fit Measures	Criteria	Model
<i>Absolute Fit Measure</i>		
Chi-square ( $\chi^2$ ) of Estimated Model	-	262.52
Degree of Freedom ( $df$ )	-	165
Chi-square/Degree of Freedom ( $\chi^2/df$ )	[1, 3]	1.59
Root mean squared error of approximation (RMSEA)	$\leq .08$	.062
<i>Comparative Fit Measures</i>		

Non-normed Fit Index (NNFI)	$\geq .90$	.92
Comparative Fit Index (CFI)	$\geq .90$	.93

Table 2: Summary of statistical tests of the hypotheses in Figure 1

Paths in the structural model	Point estimate	<i>t</i> -value
Strategic orientation towards 3PL suppliers → 3PL suppliers' core capability (H1)	0.44	4.37**
Strategic orientation towards 3PL suppliers → 3PL suppliers' augmented capability (H2)	0.50	5.18**
3PL suppliers' core capability → Logistics competence (H3)	0.20	1.94*
3PL suppliers' augmented capability → Logistics competence (H4)	0.53	4.56**
Logistics competence → Export performance (H5)	0.23	2.22**

\*\* : significant at  $p < 0.05$  level.

\* : significant at  $p < 0.1$  level.