A Model for CompetitiveService Level of LogisticsService Providers in Thailand - Vietnam – China

Pisoot Thankdenchai
Doctoral Candidate, Logistics and Supply Chain Management
College of Logistics and Supply Chain, Sripatum University, Thailand

Tharinee Manisri, D.Eng.
Assistant Professor, Logistics and Supply Chain Management
College of Logistics and Supply Chain , Sripatum University, Thailand

Subin Yurarach, Ph.D.
Associate Professor,
Graduate College of Management, Sripatum University, Thailand

Abstract

The objectives of this research were to develop a causal relationship model for competitive service level of logistics service providers in international transportationand investigate the direct and indirect effects in international transport logistics of Thai, Vietnamese and Chinese service providers. Samplings were 509 logistics service providers from Thailand, Vietnam, and China, using purposive sample selection method. Questionnaires were analyzed by descriptive statistics and Structural Equation Modeling (SEM), using Lisrel version 8.80. Findings were the causal relationship model was fit to empirical data with the Chi-square (X2) = 72.75, df= 62, p = 0.165, GFI = 0.98 AGFI = 0.97, RMSEA = 0.018. The direct effects showed the competitive Service Level (SVL) was affected byDominant Power on selection(DOM) with coefficient value at 0.37, and also from Service Performance Unit (SPU) as 0.36. The competitive Service Level (SVL) was affected indirectly by Dominant Power onselection(DOM) at 0.11, followed by Strategic Sourcing Technique (SST) at 0.09respectively. Moreover, the variables valued the reliability in between 0.54 - 0.94. The highest reliability wasfactors: Cost and Flexibility (Z1, Z3) which were equally at 0.94. For the lowest reliability value was: Risk avoidance (Y4) valued at 0.54. For implementation and recommendation in future researchto modify the degree of observed variables in Service Performance Units (SPU) which may significant differently in a different policy and local cultures in different countries.

Keywords: competitiveness, service level, logistics service provider

Introduction

Global economic pressure with a high competition required business firms to search for more competitive advantages. Most edges of competitiveness in research were several studies about developing strategic theories and practices. Organizational development relates to firm's process re-design to gain for more firm's competitiveness. The process-bases (input-

process-output) were considered to examine the factorsthat affected competitiveness of the service in internationaltransport business. The conceptual source was a technique that identified the use of insource or outsource decision which support the organization's competitiveness and leads to a competitive firm, benchmarking with neighbor countries and best practice. The decision made during supplier selection was also important at the middle-stream if the decision was made due to price, people or policy focus. However, the latent of service quality was also measured on its effect on customer's satisfaction. The final outcome at the downstream was the service level. This paper aims to investigate the influencing variables by Strategic Sourcing Technique (SST), Dominant power in selection (DOM), Service Performance Units (SPU) and the Competitive Service Level (SVL).

This research investigates the serviceability in developing the competitive service level model in logistics transport business. This study enriches organizational re-design and development for success and best practice towards logistics business competitiveness. The ability in competitive advantages gained was the most essential key and highlight to conduct a survey for the study.

The researcher investigated the competitiveness of logistics service providers in three countries: Thailand, Vietnam, and China and examined the invariance of the model and its generality.

Research Questions

1. What are keys driven for the international transport logistics service provider's competitiveness?
2. Which variables are the significant factors (direct and indirect effects) factors influencing the service level competitiveness?
3. Is the model generally enough to be applicable for service providers in other countries? (Case study: logistics service providers in Thailand, Vietnam, and China).

Research Objectives

1. to find the most significant factors producing the highest impact on the level of competitiveness in the international logistics transport business;
2. to investigate the direct effects and indirect effects of competitiveness variables of logistics service providers in Thailand, Vietnam, and China;
3. to develop a causal model and investigate the model is invariance (case study: Thailand, Vietnam, and China)

Research Scopes and Limitations

The researcher selected three countries in AEC such as Thailand, Vietnam, and China. As a geographical constraint, the study ignored Singapore and Malaysia with a reason that both of them are transshipment hubs and operated as carriers' connection. The differences between infrastructure bases, mega investments, and functional processes as a cross-docking distinguish the general pier activities.

Lao PDR is a landlocked country. Cambodia is still in developing logistics infrastructure on roads and highways. Therefore, the study will not include all the said countries which a constraint in comparison without bias on measuring performance. Thailand as a member of ASEAN (Association of Southeast Asian Nations) operates three main marine ports which areBangkok port, Leam Chabang and ICD Lad-krabang as an inland port. Among AEC members (THAI-AEC, 2015) Vietnam is also a member country which has three major ports such as Hochiminh, Haiphong and Hanoi and they are closed to Thailand (where Lad-krabang and Hanoi were inland ports for maritime service). Therefore, Vietnam could be the best country in marine service to compare with Thailand. However, China is the biggest player with the greatest volume of export/import activities and numbers of service providers will be the best sample in benchmarking.

Regarding to LPI score (the World Bank, 2012) that showed International shipment over 3.00 within 55 countries rank, it mentioned that the nearest countries to Thailand and in South East Asia countries are Vietnam and China. Hence, the limitation of this survey research was made only in these said three countries: Thailand, Vietnam, and China.

Table 1

LPI Ranking and Scores only ASEAN

Country	LPI Rank	LPI Score	Customs	Infra-structure	International shipments	Logistics competence	Tracking & Tracing	Timeliness
Singapore	1	4.13	4.10	4.15	3.99	4.07	4.07	4.39
Hong Kong	2	4.12	3.97	4.12	4.18	4.08	4.09	4.28
Japan	8	3.93	3.72	4.11	3.61	3.97	4.03	4.21
Taiwan	19	3.71	3.42	3.77	3.58	3.68	3.72	4.10
Korea, Rep.	21	3.70	3.42	3.74	3.67	3.65	3.68	4.02
China	26	3.52	3.25	3.61	3.46	3.47	3.52	3.80
Malaysia	29	3.49	3.28	3.43	3.40	3.45	3.54	3.86
Thailand	38	3.18	2.96	3.08	3.21	2.98	3.18	3.63
India	46	3.08	2.77	2.87	2.98	3.14	3.09	3.58
Philippines	52	3.02	2.62	2.80	2.97	3.14	3.30	3.30
Vietnam	53	3.00	2.65	2.68	3.14	2.68	3.16	3.64
Indonesia	59	2.94	2.53	2.54	2.97	2.85	3.12	3.61
Pakistan	71	2.83	2.85	2.69	2.86	2.77	2.61	3.14
Sri Lanka	81	2.75	2.58	2.50	3.00	2.80	2.65	2.90
Armenia	100	2.56	2.27	2.38	2.65	2.40	2.57	3.07

Cambodia	101	2.56	2.30	2.20	2.61	2.50	2.77	2.95
Lao PDR	109	2.50	2.38	2.40	2.40	2.49	2.49	2.82
Myanmar	129	2.37	2.24	2.10	2.47	2.42	2.34	2.59
Nepal	151	2.04	2.20	1.87	1.86	2.12	1.95	2.21
Burundi	155	1.61	1.67	1.68	1.57	1.43	1.67	1.67

Definition of Terms

3 PL	Third Party Logistics (LSP: Logistics Service Provider, Freight Brokers)
4 PL	Fourth Party Logistics (integrated more in I.T. system or network application control with customers than 3PL at shipper's premises site)
Co-load	Outsourcing for cost and service giving by other operators to operate
Consolidation	Full containers gather all LCL (partial) shipments as own make.
Dominant Power	Dependence and Relationship commitment, included the Organization Theme (Managerial), Corporate Theme (Middle); Function Operation Theme (Staff)
Dominant 3P	Collaboration of firm (Policy); Operational performance (Price); Relation with trading partner (People)
Flexibility	Service level by flexible time and lot Size
Freight Supplier	The logistics provider who sells the freight rates cost (the first tier supplier acts as master consolidator or second and third tier as co-loaders)
LCL	Less than a Container Loaded, charge per unit of measurement or tonnage
MoB	Make or Buy decisions (Make means by arrange own consolidation service; Buy meansoutsource to co-loader).
Service Level	Cost, mean delivery time and delivery time valiance (Cooper, 2007).
Service Perform	assessment of business benefit delivered.
Sourcing Technique	A purchasing method in single & multiple sources.
SPU model	Service 5Rs dimensions on performance: Reliability, Rates, Resources, Risk avoidance, Responsiveness.
TCO	Total Cost of Ownership: purchasing cost to salvage value.
T/T	Transit Time or Lead-time.

Research Framework

Figure 1 shows three processes; up-stream, middle-steam and down-stream and it has latent variables such as Sourcing, Selection and Service Performance which affected to the Service Level Competiveness.

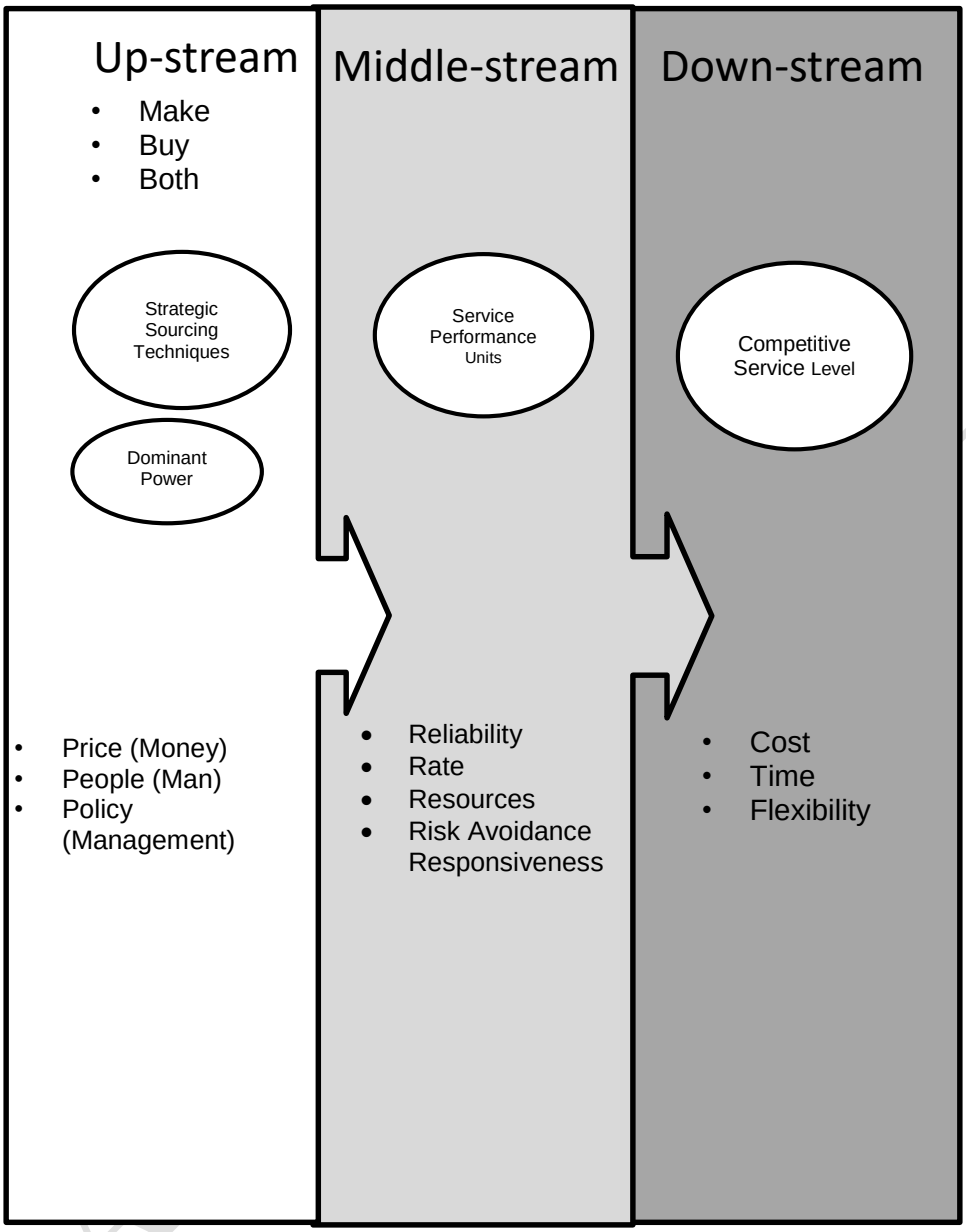

Figure1. Conceptual Framework of Competitive Service Level

In the Up-stream process, there are two latent: Strategic Sourning Techniques and Dominant Power on Selection. The first latent are Strategic Sourcing Techniques (SST) that include three choices that firm should makesuch as the choice of an own make (insourcing) or the choice to buy from others (outsourcing), and "Both" choice (Dugdale, 1985; Ellram and Maltz, 1995; Probert, 1996). Strategic Sourcing Techniques (SST)is the decision choice of a firm's input from decision choices of Make or Buy (MOB). The variables were named: X1, X2, and X3 respectively. The second latent is the Dominant power on supplier selection

(DOM). In Dominant power on selection (DOM), firms make the selection of their suppliers/partners based on price, people or policy. The variables were shown as X4, X5, and X6 respectively.

The middle-stream process is an "operation process" during the operating services. It has Service Performance Units (SPU) latent. SPU contains five aspects (5Rs): Reliability, Rates, Resources, Risk avoidance, and Responsiveness. The variables were shown as Y1, Y2, Y3, Y4 and Y5.

The down-stream process includes the dependent latent as Competitive Service Level (SVL)that constructs three observed variables: Cost; Time; Flexibility (Ramsay and Wilson, 1990; Southwood, 1995; Spina, Campanella & Codeluppi, 2000; Vanichchinchai, 2012; Yuttapong and Sataporn,2010). The dependent variables were showed as Z1, Z2, and Z3 respectively. Table 2 showed the latent and type of variables and meanings.

Table 2.

Latent and Variables' names and meanings

Symbol	Variables Name	Type of Variable
SST	Strategic Sourcing Technique	Latent 1 (L1)
X1	Make	Observed Variable
X2	Buy	Observed Variable
X3	Both	Observed Variable
DOM	Dominant Power on Selection	Latent 2 (L2)
X4	Focus on Price	Observed Variable
X5	Focus on People	Observed Variable
X6	Focus on Policy	Observed Variable
SPU	Service Performance Units	Latent 3 (L3)
Y1	Reliability	Observed Variable
Y2	Rates	Observed Variable
Y3	Resources	Observed Variable
Y4	Risk Avoidance	Observed Variable
Y5	Responsiveness	Observed Variable
SVL	Competitive Service Level	Latent 4 (L4)
Z1	Cost	Observed Variable
Z2	Time	Observed Variable
Z3	Flexibility	Observed Variable

The is a total of four latent with 14 observed variables in this study. The research hypotheses are as follows:

Hypothesis 1: Strategic Sourcing Technique has a direct relationship to Service Performance Units.

Hypothesis 2: Strategic Sourcing Technique has a direct relationship to Competitive Service Level.

Hypothesis 3: Strategic Sourcing Technique has an indirect relationship to Competitive Service Level via Service Performance Units.

Hypothesis 4: Dominant Power on selection has a direct relationship to Service Performance Units.

Hypothesis 5: Dominant Power on selection has a direct relationship to Competitive Service Level.

Hypothesis 6: Dominant Power on selection has an indirect relationship to Competitive Service Level via Service Performance Units.

Hypothesis 7: Service Performance Units has a direct relationship to Competitive Service Level.

Review of Literature

Strategic Purchasing and Competitiveness

Dale and Cunningham (1983) stated that purchasing often has the most contact with suppliers and can contribute with input on their quality, lead times and costs.

Ramsay and Wilson (1990) suggested that a buyer who has only one source of supply for material or service had risky accusations of either incompetence or corruption. Today in many market sectors, buyers who retain multi-sourcing practices are regarded as curiosities. In the conclusions, they suggest that contrary to current practice where the combination of single sourcing with long-term contracts is rapidly becoming the norm, companies with large purchasing budgets would get benefit from concentrating their efforts on other strategy combinations. With their further suggestion, a single sourcing with long-term contracts is best regarded as a specific option for the small, weak purchasing department. Finally, their design illustrated the six possible combinations of sourcing and contracting strategies on a matrix as shown in Figure 2.

Sourcing strategy	Contracting strategy		
	Short term	**Medium term**	**Long term**
Single-source	Punishment Run-in/out Limited liability strategy	NA	Low purchasing power strategy
Multi-source	Punishment Run-in/out Limited liability strategy	Probationary strategy	Reward Growth Low power strategy

Figure 2. Sourcing Strategy Combinations (Ramsay and Wilson, 1990, p.27).

Green, Zimmerer & Steadman (1994) explained the buying process by which industrial goods are usually organized, results are complex and characterized by many decision makers, numerous decision variables, and several stages or step. The samples of variables in making a decision area price, quality, delivery, service and many intangibles such as confidence in the vendor, reputation, and goodwill. These relative importance criteria may change during different stages of the competitive bid process. The low price is relatively not important when the buyer's primary concern is to establish the level of quality necessary to meet the needs of the user.

Canez, Platts & Probert (2000) concluded that make or buy in purchasing decision resulted in an increasing awareness of the importance of make-or-buy decisions. Make-or-buy decisions are often made purely by cost. Moreover, cost as a part leads the competitiveness.

McIvor and Humphreys (2000) made an argument in their study that few organizations have taken strategic views of make or buy decisions. However, this is likely to have occurred due to a series of short-term decisions with no consideration for the long-term strategic direction of the organization. This supports the work of Ramsay and Wilson (1990)) and had fallen in their matrix of contracting strategy that firm should consider more on their sourcing for a long-term with a combination of strategies.

Spina, Campanella & Codeluppi (2000) introduced make or buy decision with transportation that is increasingly enriched by the third way of strategic partnerships. In fact, several non-cost factors should be included in MOB decision and carrier selection, which makes the quantitative model aimed exclusively at minimizing the total logistic costs hardly applicable.

Baily et al. (2005)suggested that the competitive advantages available from purchasing strategies was buyer focus on amix of resources; emphasize creative management in resource utilization vis-à-vis competition.

De Boer, Gaytan & Arroyo (2006)) suspected and argued that many managers find difficulty to transfer general frameworks for outsourcing into practical decision-making action. For exampletaking the outsourcing of logistics activities, the purchasing of comprehensive logistics services was increasingly becoming more complex.

Lysons and Farrington (2006)) stated that competitive advantage sought via lower cost or inventories. They recommended one of the most popular portfolio approaches should be the Boston Consulting Group (BCG) matrix. The strategies are to adopt all three strategic organizational levels: corporate, business and functional/operational.

Handfield, Monczka, Giunipero & Patterson (2009) reviewed that the communication linkage of many firms are now through co-locating supply management personnel directly at operating locations.

Dale and Cunningham (1983) confirmed empirical findings state that companies sometimes use quality as criteria for supplier selection.

Suggestions from Lambert et al. (as cited in Sankaran et al., 2002) prescribed a model for partnership development. They synthesized out most three major elements: drivers, facilitators, and management components. Hence, the supplier relationships after supplier selection should able to guide the purchasing process and this followed the work of Sink & Langley (as cited in Sankaran et al., 2002).

Holter et al. (2008) agreed with Grant (2005) that relationships between SME buyers and LSP are building trust and commitment. It is possible that most SMEs are order takers (who purchase with risk attachment) due to their limited purchasing power.

Zammori, Braglia & Frosolini (2009) identified that the main issues must be covered in the agreement to fit the needs of both parties and to assure benefits on both sides. Partners must focus on their core competencies and keep together the expertise of external partners.

Wilding and Juriado (2004) confirmed their survey results that most consumer goods companies that admitted soft issues in performance measurement about cultural incompatibility and poor communication lead to the failure of the 3PL partnership.

Thankdenchai and Pasawat (2015) mentioned in their work about the Nestlé's impacts and difficulties on the best practice. The possibilities on challenging the hardness in a relationship with partners could be happened by the low price and standalone decision without prior informed and sharing these were: - If a customer's behavior as shopping around

for the lowest price. Their supplier's selection, perception and strategy are only based on the best lowest price to place the order. Nevertheless, the customers launch their in-house promotion without prior notices. These two classic cases should be aware that it affects to break the internal chain relationship among members' partnership. The measurement of "Trust" reflected the relationship among vendors. The review of related study synthesizes to 3P which relationship always affects in purchasing and selected supplier decision and most favorites in the focus were affected by Price, People, or Policy. On the other hand, they can be treated as 3M which are: Money, Man, or Management and these three focus factors were mainly dominant power to encourage the relationship building and supplier selection.

Theoretical Research Concepts & Design

"Serviceability" the non-financial items: known as "Subjective" strategies were divided into four domains of the study. Under systematic thinking, this research emphasized more at the beginning of the input process (Figure 3).

The first domain is the upstream on the sourcing techniques (source of material & its suppliers, the design was aimed to explore the service providers in purchasing behaviors with procurement as fundamental. The sources of purchasing were divided into three sources of Make or Buy: MBO strategies: Make (in-sourcing), Buy (outsourcing) , and both Multi-methods (M&B).

The second domain highlighted the investigation of relationships during purchasing decisions with dominant decisions. The company's sources of suppliers were not included since the beginning of servicing (Upstream supply chain).

The domain focused on types of the dominant power in relationships building with selected sources (supplier relationship motivation at the final decision). A question on the decision making before the purchase was the establishment of a relationship types and sources of influence. The key factor in a relationship with partners whether had influenced by a personal decision maker or organizational policy. This domain investigated on the most powerful dominant factor in types and sources of relationships affected to the maker of selected supplier decision.

The study of three stratified nations (Thailand, Vietnam, and China) on service operators could benefit to understand their local practice and strategic trends. The interpersonal skills in further relationship development may affect to gain lower cost. For an instance, organizational relationship compared with friendship (a better personal relationship). The Chinese supplier may give lowest price offer. As predicted (before going to a proven test), the outcome result may be true, if such a buyer focus on price and on building a personal relationship rather than organizational relations.

The third construct is the middle stream. The study framework designed and discussed based on same direction congruent with the first and second domains as mediator latents. The five dimensions of service performance, a five scale aspects (likely as Total Quality Assurance: TQF) of service quality were examined.

The model was adopted from previous articles as Service Performance Units: SPU (Thankdenchai, 2013) . The concept of PZB model from Parasuraman, or the five dimensions of ServQual model was named "RATER" (Reliability, Assurance, Tangibility, Empathy, and Responsiveness). The new modified model into the 5Rs with elimination off the driver "Empathy", and employed "Rate" for monetary perspective into the model studied replacement. Since several arguments were discussed on the definition and meaning of Empathy, most were shown for the understanding of the customers' needs and regarded as sympathetic understanding. Therefore, if s/he is a new client as a newcomer, e.g. a first time purchasing or a tourist as a new walk-in customer, it was not able to learn what his /her standard of requirements. The company could learn such needs from the past experiences only with their existing customers.

The cost perception in a way of a price focus (which cost perceives had withdrawn from the previous version of ServQual was brought back as “Rate” in quality price perception of being cheap, reasonable or expensive.

“Assurance” was a constructed in the PZB model as warranty. According to the risk management theory, most transporters have their transport insurance coverage. ExporterS and importers purchase the cargo insurance. The responsibility for delivering goods depends on the trading term agreement (Incoterms). The protection of goods during delivery with insurance as risk management covered / while assurance was meant “Risk Avoidance”. This included the warranty or certificate to ensure the qualities of products or services.

Tangibility is defined as the “Resources” ‘ which included all means of assets such as own operating system, properties, staff, fleets, warehouse, tools and equipment, as well as the operating system and I.T. network that related directly to the operating firm for service performing.

The fourth domain construct is service level perceptions from many studies (Cooper, Lambert and Pagh ,1997) ; Lambert and Pohlen (2001). They indicated that the service performance in logistics and transport often includes the cost and time variance with rapidity speeds or reliability in transport to build up firm’s performance and competitiveness. The service level yielded into three dimensions as performance. This study applied cost, time and flexibility in measured matrix.

Figure 3 shows the activities with value added of service and tier in supply chain of logistics transport service (Sea mode).

Logistics Transport Service Provider's Structure (Maritime FCL / LCL)

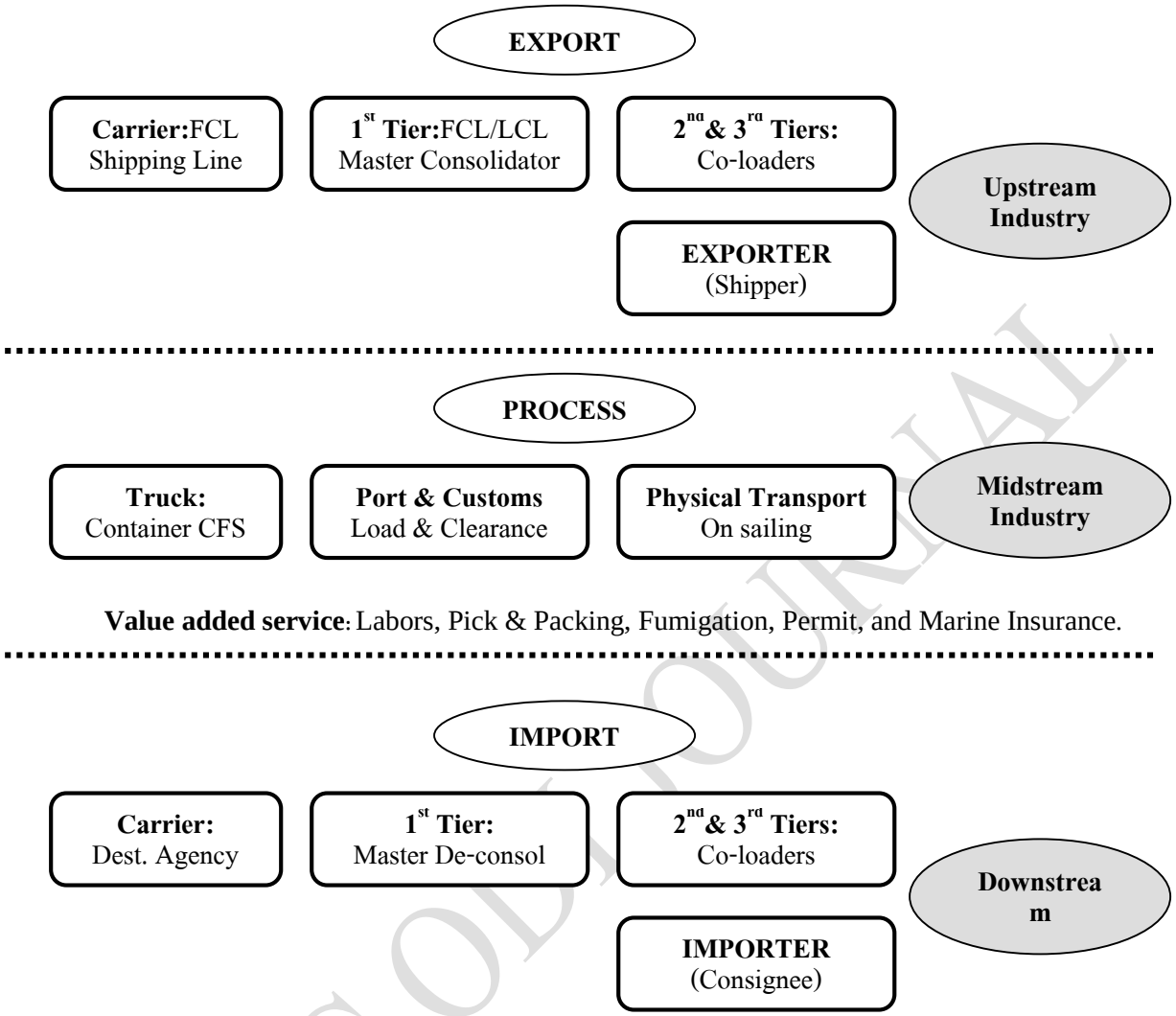

Figure 3. Supply Chain of Service Providers in Sea Transport (Author)

Developing Model and Modification

Past works and related studies

Cavusgil and Das (1997) found that much of cross-cultural sourcing research studies is somewhat bereft of considerations of functional and conceptual equivalence or at least from the explicit discussion for relevant culture-susceptible variables identified by past studies. Most studies did not consider intra-country differences in selected variables while assessing the significance of general similarities or differences in those variables. Though, it

needed some measure of congruence on the relevance of the theory for that particular cultural context before making a conclusion.

Giunipero and Monczka (1997) claimed that the different parts of the world from which to source; commodity availability in various regions of the world; and the need to understand currency fluctuations. Such approaches address operational issues associated with global sourcing. This operational orientation does not meet the requirements of upper-level executives whose questions concern how they should manage their international purchasing efforts at their best.

Porter (as cited in Giunipero & Monczka, 1997) argued that while cost leadership and differentiation are opposite ends of a continuum and a differentiator cannot ignore its cost position and a cost leader cannot ignore differentiation.

Holter et al. (2008) recommended the need for measuring transport performance to relate to a carriage service specification. The literature discussion had structured around four themes: general transport purchasing; the SME aspect of transport purchasing differences between purchasing the conventional transport services and 3PL services; and the application of general purchasing tools for the carriage procurement.

However, they suggested that experienced internal barriers need to address the external obstacles, otherwise these proved more difficult and less successful.

Lyons (2015) suggested that a well-known CSE (Core self-evaluation) in HR research needs analysis assessment.

The study on non-financial items as ServQual based on maritime study claimed that the PZB model needs to be modified. Vinh (2007) suggested to bring Service Quality into sea transport to better understand service providers.

Scores, Scaling and Weighing

The past study reviewed the scales ratio for weighing differentiates for the level of competitiveness and those who merely meet the break-even point. Yount (2006) showed 12 scales in his research design and simple statistical analysis. The five points Likert Scale, The Thurstone's 11scales, The Q-Sort Scale, and The Semantic Differential were mainly used for scoring recommendation to suit different purposes. Four consultants served as panel of advisors, where two academics were familiar with the international forwarding industry and lecturers in logistics and supply chain management, one academic statistician specialized in education quality assurance and assessment research and one practitioner. Finally, all given comments were concluded that developing method must be scaled equivalently for more than ten levels to divide the capabilities into at least 3-4 categories.

Developing tools for scores rates followed the Likert's scale which consists of statements that are all of equal weight (Yount, 2006). Table 3 illustratesThurstone's 11 scales.

Table 3.

Scale Ranking: Sample of the Thurstone Scale

Indicators	11		Cum	Mean/Cu	Meaning
Bad		1	0	0	Bankrupt
		2	3	1.5	Worst
		3	5	2.5	Crisis & Heavy loss
		4	7	3.5	Continued loss
		5	9	4.5	Loss & B/E Challenge
(Moderate)		6	11	5.5	Equally B/E & Loss Challenge
		7	13	6.5	Profit - Competitive (today)
(Good)		8	15	7.5	Profitability - Competitiveness (these days)
		9	17	8.5	Profitability Advantage - Competitive Advantage (by week)
(Excellent)		10	19	9.5	Profitability enables longer Compete - Being Sustainable (by month)
Best		11	21	10.5	Wealth Stage -long-term Compet = Sustainable Competitive Advantage (by

Source: Thankdenchai (2015)

The Thurstone attitude scales have a range of weighing from the highest to the lowest (from 11 to 1 usually). The scores result from computing the average of the weights on selected items. Thus, this study adopted the Thurstone 11 scales for scoring. Therefore, previous calculation and pilot-tested were done with the results showed in work of Thankdenchai (2015).

The scores of each scale have transformative value for every stage. Such a value was interpreted from quantitative input data as a measurable objective into a qualitative explanation subjectively. The moderate level represented a setting break-even point (x-bar) by means of the group studied. When one's revenue is lower than the break-even, such company is challenged into facing loss stage. It was not essential to think further for its competitiveness than how to secure back the business's income. Recovery from a loss to sufficient profit level might be considered. Alternatives to gain back the equivalent cost for break even, higher income would be further related to any other activities besides its sales, marketing, and promotions. For the recapitalization, re-injection from their stakeholders is not included in this study.

Model Modification

SERVQUAL Model (PZB) Discussion

The delineation of SERVQUAL theories before modification as a useful model was summarized and discussed. This section highlighted in delimitation; delineation and elimination of drivers whether should or should not be applied the driver "Empathy". These were the emancipation and embankment on the model constructions.

Matear and Gray (1993) mentioned that the important criteria used for selected suppliers in sea freight must include service efficiency, readiness in quality assurance and risk recognition. These perceive the attributes emphasized on Assurance and Risk avoidance.

Min (1994); Whyte (1993) proposed the following variables: transportation time, risk recovery, the flexibility of service charges, the understanding of the problems and the willingness to help as main criteria for supplier selection. In their conclusion, risk perceives replacement along with the empathy of service quality.

However, previous discussion was about Empathy in ServQual that will be suited only with the old customer who existed and engaged in the service. However,it might not be suitable with the newcomer because the newcomer is at the position of a potential stage of being a client. Therefore, the empathy would not exist in any casesas the main reason to desist the variable of Empathy out of the framework and re-functioned for a lower degree dropped into Responsiveness as an item into "willingness to help" which had been proposed by Whyte (1993).

This is congruent to the work of Imrie et al. (2000; 2002). The survey challenged the validity of SERVQUAL, which had not employed "Empathy" into their studied dimensions, but elaborately replaced by "politeness and courtesy; sincerity" as performance to response the customers. The meaning of their study was its implication to avoid broadly elaborated meanings of Empathyin the Asian context (Vinh, 2007).

Hence, the main dimension as Empathy was re-employed by price dimensions adopted from its previous origin PZB model to bereplaced by "Rate": Monetary perceives either rate, fees, wages, overtimes, and any about cash, benefits, profit earn in the form of a financial variable perceives.

Measuring Model and Analyzed Data Application

Freight purchasing with decision making, relationships, and service quality affects competitiveness. (Hunter, 1972; Whyte, 1993; Probert, 1996; Canez, Platts & Probert, 2000; Fill and Visser, 2000; Gunasekaran et al., 2004; Chow, Choy and Lee, 2007; Cooper, 2007; Holter, 2008; Mohamed and Jones, 2014). All were retrospectively ideal, variable, drivers and gaps research to draw from subjectives to be objectives by weighing scales into a new framework. The way to analysize the data from various variables into multilatent regressions at the same time usually employed the SEM (Structural Equation Modelding) program for the model measurement.

Another work on Quality Management Practices in Purchasing, QMPP framework showed Information Systems Practice: IS with Purchasing Performance: PP offered by Hemsworth, Rodriguez and Bidgood (2006) constructed their interested study in information system and purchasing practice and employed LISREL to analyze the data and model measurement (Figure 4).

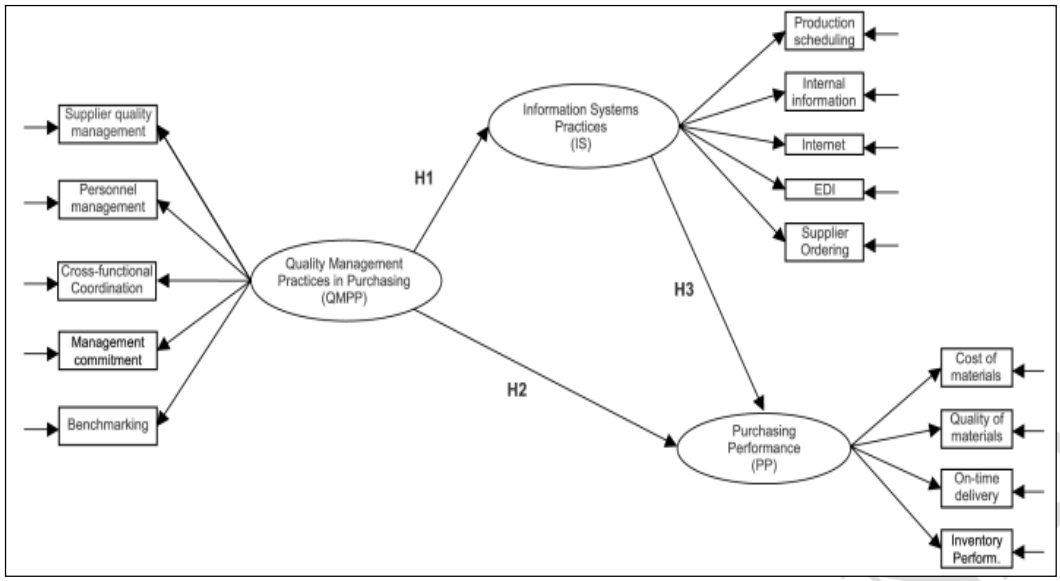

Figure 4. Theoretical Model of QMPP (Hemsworth et al.,2006).

Hemsworth et al. (2006) analyzed databy LISREL and showed the correlation of Management commitment with Cross-functional 0.47, Personal Management 0.54, Supplier Quality 0.38. The Cross-functional Coordination with Personal management was the highest at 0.50 Personal management relationship with Supplier quality management at 0.64.

The Full model constructs as Quality management practice related to Information Systems 0.60 and purchasing performance at 0.47.

For the Constrained model, the degree of freedom: df value results showed that the highest three degrees of freedom were Personnel management with Supplier Quality at 90.52 and Full model as Purchasing performance at 71.67, Information Systemsat 63.47 respectively. They also claimed that the benchmarking as one of the variables in quality management had no any significance to management commitment and unable to be computed because such construct each had only three measurement variables.

However, researcher considered the above reasons differently. In fact, such constructed structure of benchmarking should be an individually dependent variable than a mixed variable. It could not confirm benchmarking constructs for the same management commitment. Their study concentrated on measuring Information Systems Practices that affected the Purchasing Performance. This causes a mistake in framework design process.

Their analyzed outcome showed that personnel management which this research regarded as resources, and their information system would be measured only as track and trace. Therefore, both will be included in this research as a part of measuring items.

The Output Competitiveness

Competitive Service Level

In competitiveness in transport verified by Cooper)2007(, the three main variance that affect service levels are cost variance, time and reliability of delivery .Dugdale)1985 (suggested most competitiveness was built through the insource and outsource decision.

Choy et al) .2003 (emphasized the selection appropriated suppliers who produce the good price and good quality will lead competitiveness to the company. Lysons & Farrington)2006 (indicated that supplier with competitive price, quality and lead times are simply found in world class supplier attributes.

Ramsay and Wilson)1990 (suggested that a buyer has risk accusations of either incompetence or corruption when he has only one single source of supply .Hence in this study, the survey provides measuring items into three facets which were :cost, time, and flexibility .The three main attributes constructed to congruent the three well-known price, speed, and agility .

Cost in service level

Green, Zimmerer & Steadman)1994 (described that the low price is relatively unimportant when the buyer is concerned with the level of quality to meet the customers, while the low quality or high price cannot expect purely social efforts to win an order without other competitive influences.

Dugdale)1985 (suggested to measure the cost in many aspects. In the alternative aspect of marginal cost analysis, a computation is made of the variable costs involvedonly, i.e .direct material, direct labor and variable overhead .Ellram and Maltz)1995 (found their findings that most respondents with a straight price comparison would have led to the rejection of the third-party alternative, even though outsourcing resulted in both initial and long-term cost reductions .

Spina, Campanella & Codeluppi)2000 (confirmed that the cost competition plays a dominant role, and it is almost impossible to create different quality of the products, and a superior service level can ensure customers' loyalty.

Time in service level

Hemsworth et al) .2006 (offered Real-time and Quick which concentrated only on these two categories constructs had a relationship in purchasing-related to firm's commitment .Time is also an important variable, especiallyit is the most important either in just-in-time or VMI implementation .Further reading was recommended for the essential of critical time management in replenishment)Thankdenchaiand Pasawat, 2015.(

Flexibility in service level

Ramsay & Wilson)1990 (suggested that the flexibility accusation could be happened by the disadvantage of single sourcing. Leenders et al) .2002 (proposed that companies needed a supply chain that is flexible and responsiveto capitalize on the latest trends.

Southwood)1995 (defined Flexibility was the service can be adapted more easily than in-house services to meet changing needs. Yuttapong and Sataporn)2010 (defined clearly for Flexibility, and Replace ability was ability to switch the operation to another plan or process.

Coyle et al) .2011 (wrote "Flexibility "that companies can use any combination of the five transportation modes that are flexible for the best so it suits freight in the Intermodal Transportation to facilitate global trade.

R and L Global)2015 (explained about the new thread of next shift of forwarder's in service obligation .Flexibility is another valuable trait of intermodal transportation .Flexibility includes cost, obstacles, resources and time to switching.

Transport purchasing is not unique, but it presents unique challenges. Transport spans several business functions and can have a vast business impact (Holter et al., 2008). Many examples were where the dispatchers perform transport purchasing, the finance department, the inventory manager or the operation workers. Whyte (1993); Holter et al. (2008) emphasized the need for the increased professionalism of transport purchasers since there were many providers and the market could be competitive. There are differences in service quality but essentially the outcome of the service.

Nevertheless, all synchronized previous works with Rao and Yong (1994, p. 18) at the final proposed their drivers in the key factors interaction model. The same conceptual of drivers constructed in similar interpreted meaning with SPU 5'Rs model: Centrality/criticality (Resources); Risk liability and control (Risks avoidance); Cost/service issues (Rates); Information services (Responsiveness); Market relationship (Reliability).

Finally, the framework of this study that was drawn for 7 Hypotheses was shown in Figure 5.

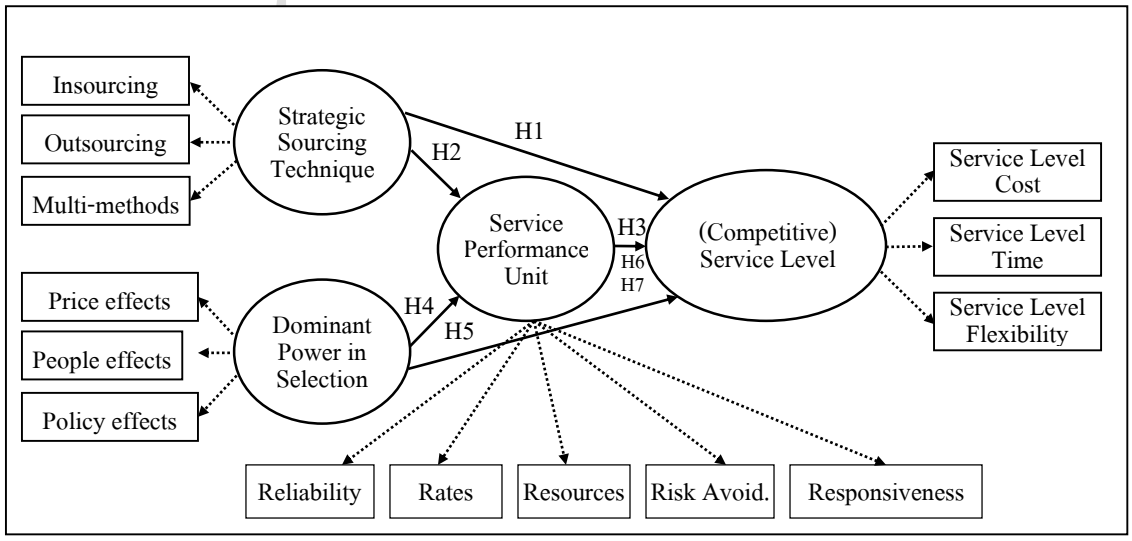

Figure 5. Conceptual framework

Research Methodology

The research survey was designed into the quantitative survey under Structural Equation Model (SEM) investigations, analyzed by LISREL (Linear Structural Relationship) to build the Causal Relationship model with seven hypotheses. the executives' interview, comments by the experts for the model and outcome results were done as qualitative survey.

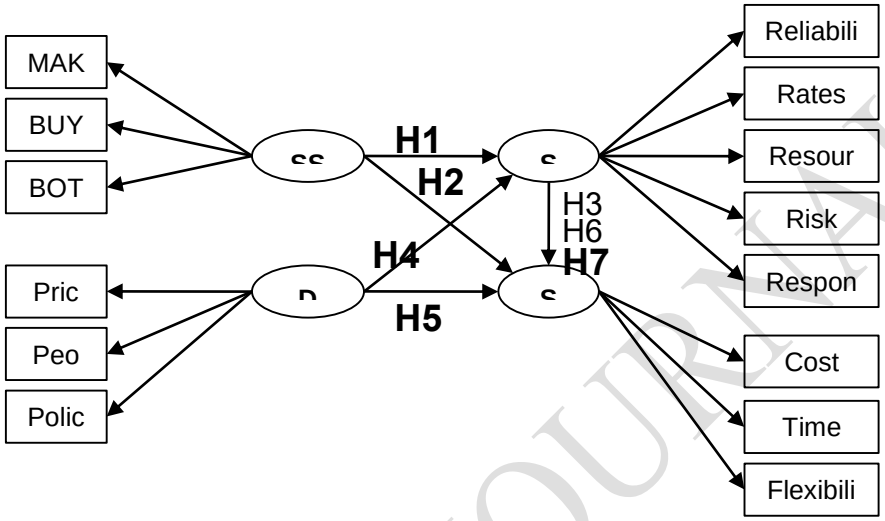

Figure 6. Diagram of Competitive Service Level

Population and Samples

Total 1,348 members were listed as a population in three countries as logistics service providers in transport members lists (214, 396, and 738 members for Thailand, Vietnam, and China respectively). Purposive selection sampling method was applied since only total 680 sets of questionnaires were able to be distributed through their activated email addresses. Total 509 set of questionnaires were completely answered and returned back, therefore the response rate was 74.85%.

Among the 509 sets of questionnaires that were received, 159 (31.24%) were from transporters in Thailand, 157 (30.84%) from Vietnam, and 193 (37.92%) from the Chinese forwarders. The investigation was made on 14 variables with the rules of thumb for minimum 20 samples per variables. Hence, the minimum requirement of sample size was 280. This study, samples size for major model was N=509.

Research Tool

By using the questionnaire with 68 items as a research tools, qualitative method design was applied by interviewing the focus group of managerial levels in transport logistics business. The type of question wordings and intention to measure the correct perception of the respondents were modified several times.

Finally, total seven of The Item Objective Congruence (IOC) committees were the experts in logistics, academicians, statistians. Practical supply chain experts were the committees who developed and modified the research tool, and checked the conent validity and congurancy was approved.The IOC scores valued in between 0.57-1.00, the final average outcome validity reached 0.82 or 82 percentages. IOC scores were tested by KR-20 and KR-21 methods. It was shown that there were no any significant differences from both methods, as rtt (0.977), ρKR21 (0.971).Pre-test was conducted by sending XLS format to all prospects. The 60 samples were randomly used as first come first serve in response as the trial group, without the priority to the nationalities of the respondents. Items were considered reliable that alpha coefficients values were 0.841as the reliability result of the research tool.

Data Collection

Data collections were made during October 2015 to April 2016 via emails. Sampling respondents were purposely selected only in the managerial levels or higher level to be approachable by email addresses. E-questionnaires in spread-sheets were sent to service providers.The survey partners provided the assistance in Vietnam and China to follow up with the email responses in upcountry and via some phone calls.

Data Analysis

Data was analyzed in descriptive statistics such as frequency, percentages, means and level of degrees. For the Structural Equation Modeling (SEM) was investigated by Lisrel version 8.80

Findings

Respondents' Profile

Total 509 respondents as shown in Table 4were divided into 3 countries and eight main core businesses. Most respondents were 3PL (Sea), and they were from China, Vietnam, and Thailand at 79.79%, 64.97%, and 62.89% respectively.

Table 4.

Respondent by Type of Business and by Countries

TYPE (N)	Thailand	Vietnam	China	**Total**	TH (159)	VN (157)	CN (193)
3PL (Sea)	100	102	154	**356**	62.89%	64.97%	79.79%
Liner	28	6	7	**41**	17.61%	3.82%	3.63%
4PL	9	15	4	**28**	5.66%	9.55%	2.07%
3PL (Air)	10	4	13	**27**	6.29%	2.55%	6.74%
Custom	8	8	3	**19**	5.03%	5.10%	1.55%
Truck	2	10	7	**19**	1.26%	6.37%	3.63%
Other	1	10	1	**15**	0.63%	6.37%	0.52%
W/H	1	2	1	**4**	0.63%	1.27%	0.52%
(**Total**)	**159**	**157**	**193**	**509**	**100%**	**100%**	**100%**

Table 5 showed the frequency of sourcing as own make consolidation (Consol) or buy from others (Co-load).

Table 5.

Strategic Sourcing (3 Ports)

SST	Thailand	Vietnam	China	Total	TH (509)	VN (509)	CN (509)	Total%
Consol	65	6	27	**98**	**12.77%**	1.18%	5.30%	**19.25%**
Co-load	37	38	103	**178**	7.27%	7.47%	**20.24%**	**34.97%**
Both	57	113	63	**233**	11.20%	**22.20%**	12.38%	*45.78%
(All)	**159**	**157**	**193**	**509**	**31.24%**	**30.84%**	**37.92%**	**100%**

Outcomes from Table 5 showed the frequency and percentages as below.

Thailand: Most of them selected to Consol (Make own consolidation service), followed by applied "Both" (Make and Buy) strategy. The strategy of "Co-load" (Buy only) are approximately only 7% as same as Vietnam.

Vietnam: Most of them applied "Both" were the highest of all groups (22.20%), and very less in "Consol" (1.18%).

China: Most of them applied "Co-load" (Buy only) (20.24%), and utilized "Both" methods as half of the group of "Buy" only (12.38%).

Table 6 showed the frequency outcome of dominant decision on selection. The survey was asked to the respondents to choose for who has most powerful to change the respondent's decision. As an instructor or advisor to guide or leads those to make a decision for which suppliers must be selected. The choices were: making my own decision, by staff or friend's recommendation, by manager's guidance, or by the firm's policy.

Table 6.

Decision Making on Selection

DM.SELEC	Thailand	Vietnam	China	Total	TH (509)	VN (509)	CN (509)	Total%
My Own	58	42	48	**148**	*11.39%	8.25%	9.43%	***29.08%**
Staff/Friend	34	8	19	**61**	#6.68%	1.57%	3.73%	**11.98%**
Manager	28	75	68	**171**	5.50%	*14.73%	*13.36%	****33.6%**
Off. Policy	39	32	58	**129**	7.66%	6.29%	*11.39%	***25.34%**
(All)	**159**	**157**	**193**	**509**	**31.24%**	**30.84%**	**37.92%**	**100.00%**

Table 6 showed the outcome in selected supplier and a relation dominated by whose decisions or leads the decision making.

 # OutcomeSSR:(Selection & Relationship)

Thailand: selection of the "Own decision" came first (11.39%) followed by "policy" (7.66%), others were quite not much differences "policy", "friends", "manager" (7.66%, 6.68%, and 5.50%).

Vietnam: Selection of their "Manager" came first (14.73%) followed by "Own decision" (8.25%) which was closer to "policy" (6.29%). And they were less to listen to their "friends" same as China.

China: Selection of "Manager" came first (13.36%) and it was closer to "Policy" instruction (11.39%).

The level of degrees criteria applied for results in Table 7.

1.00 – 1.50 = Very Low
1.51 – 2.50 = Low
2.51 – 3.50 = Moderate
3.51 – 4.50 = High
4.51 – 5.00 = Very High

Table 7. Level of Degree for Decision Making on Focus Factors

Mean	ALL	Level	TH	Level	VN	Level	CN	Level
3 Ports.MOB	2.27	Moderate	1.95	Low	*2.68	Moderate	2.19	Low
DM.MOB	2.07	Low	*2.33	Low	2.03	Low	1.89	Low
DM.Select	2.28	Low	*2.55	Moderate	2.17	Low	2.15	Low
3P Focus	ALL	Level	TH	Level	VN	Level	CN	Level
Price	3.627	High	3.509	High	3.25	Moderate	*4.03	High
People	3.552	High	*3.736	High	3.41	Moderate	3.52	High
Policy	3.503	Moderate	3.352	Moderate	*3.55	High	3.59	High

Table 7 shows the degree levels in strategic sourcing as Make or Buy techniques were quite in low level. The focus on Dominant power as price, people, and policy were mostly yield at high level. By country, Thailand concentrated on People focus, Vietnam concentrated on Policy focus, but China led on Price focus.

Constructs & Model Reliability

Table 8 showed the factor loading scores for all the 14 constructed variables. The result showed that the measured model of international transport service providers in Thailand, Vietnam, and China were congruent to the exploratory research. The standardized score yielded higher than 80%, factor loading scores: 0.52 to 0.97, with the *p*-value significant <.01 (t> 2.58).

Table 8. Model Measurement – Validity & Reliability

Constructed Factors	Factor Loading			** p <.01 t > 2.58	R^2	Factor Scores Regression
	b	B	SE			
X1	**0.63**	**0.91**	(0.03)	25.19**	**0.83**	0.77
X2	0.60	0.82	(0.03)	21.73**	0.68	0.34
X3	0.52	0.76	(0.03)	19.29**	0.57	0.25
X4	0.69	0.89	(0.03)	25.57**	0.80	0.37
X5	0.73	0.89	(0.03)	25.40**	0.79	0.33
X6	**0.75**	**0.92**	(0.03)	26.86**	**0.85**	0.45
Y1	**0.84**	0.89	(0.00)	-	0.79	0.30
Y2	0.81	**0.90**	(0.03)	27.62**	**0.80**	0.31
Y3	0.83	0.85	(0.04)	23.17**	0.72	0.33
Y4	0.63	0.63	(0.05)	13.86**	0.54	-0.20
Y5	**0.84**	0.86	(0.03)	25.63**	0.73	0.32
Z1	**0.97**	**0.97**	(0.00)	-	**0.94**	0.41
Z2	0.90	0.87	(0.03)	31.65**	0.87	0.16
Z3	0.96	**0.97**	(0.02)	59.33**	**0.94**	0.40

Maximum Likelihood: (*b*: factor loading), (SE: Standard Error), (T); B (Completely Standardized (B) >.05 = Factors are at high Convergent Validity

SEM Outcomes

The developing model for Competitive service level of logistics service providers in Thailand, Vietnam, and China showed that the good of fitness indices were passed all criteria as in Table 7 with the values: Chi-Square/df of 1.17, CFI =1, GFI =0.98, AGFI =0.97 and RMSEA =0.018 (Figure 7).

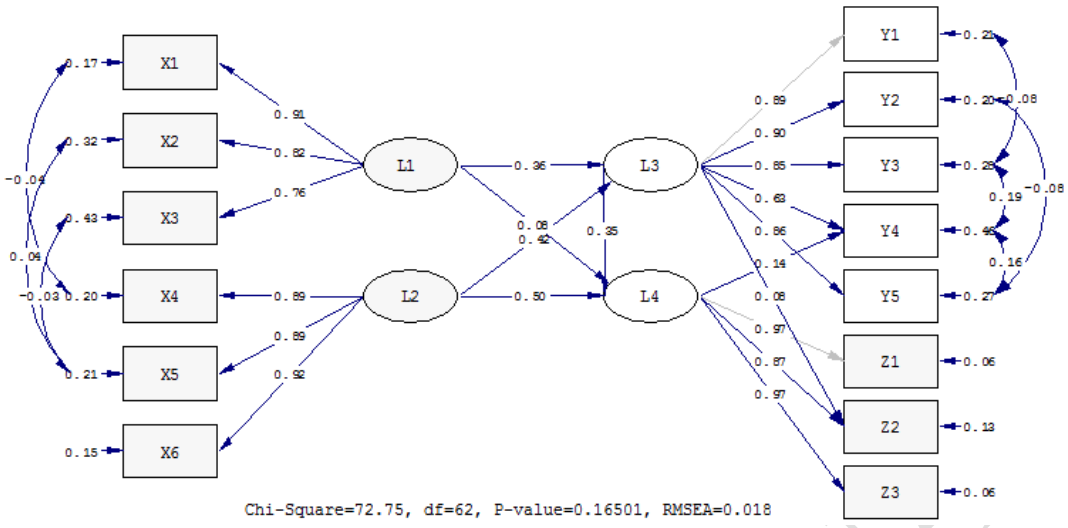

Figure 7. Path Diagram for Competitive Service Level of Logistics Service Providers

Table 9. Model after modification indices

Goodness of Fit	Criteria	Outcome	Test Result
X^2/df	‹ 2.00	1.17	**Pass**
CFI	□ 0.95	1.00	**Pass**
GFI	□ 0.95	0.98	**Pass**
AGFI	□ 0.95	0.97	**Pass**
RMSEA	‹ 0.05	0.018	**Pass**

(2) Path Analysis for Total Effects, Direct and Indirect Effects.

Structural Equation Model: SEM was employed to investigate the Path co-efficient for the service providers in logistics and transport competitiveness on the service level. The outcome showed the Direct Effects (DE); Indirect Effects (IE), and Total Effects (TE). The results were showed in Table 10.

The most impact path co-efficient was (TE: L2 to L4), the Dominant Power (DOM) to the Competitive Service Level (SVL) as total effect = 0.48, by the direct effect (L2 to L4) = 0.37. These results congruent and support the similar outcome of the correlation matrix that L2 had highest relationship to L4 at 0.77

Followed by direct effect of L3: Service Performance Units (SPU) to the Competitive Service Level (SVL) as = 0.36.

Table10.

Path Co-efficient for Competitive Service Level of Logistics Service Providers (N=509)

Causal	L1			L2			L3		
Outcome	**TE**	**IE**	**DE**	**TE**	**IE**	**DE**	**TE**	**IE**	**DE**
L3	0.26**	-	0.26**	0.30**	-	0.30**	-	-	-
	(0.03)	-	(0.03)	(0.03)	-	(0.03)	-	-	-
	7.42	-	7.42	8.70	-	8.70	-	-	-
L4	0.15**	0.09***	0.06**	0.48***	0.11***	0.37***	0.36**	-	0.36***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)	-	(0.04)
	4.77	5.52	1.82	14.23	6.24	11.26	8.20	-	8.20
Statistics	Chi-Square = 72.75, df = 62, P = 0.1650, GFI = 0.98. AGFI = 0.97, SRMR = 0.017								
Variables	**X**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**		
Reliability	(R2)	0.83	0.68	0.57	0.80	0.79	0.85		
Variables	**Y**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Z1**	**Z2**	**Z3**
Reliability	(R2)	0.79	0.80	0.72	0.54	0.73	0.94	0.87	0.94
Variable	**(SEM)**	**L3**	**L4**						
R Square	(Reduced))	0.50	0.61						

Correlation Matrix ETA and KSI				
LATENT	**L3**	**L4**	**L1**	**L2**
L3	1.00			
L4	0.71	1.00		
L1	0.62	0.59	1.00	
L2	0.64	0.77	0.61	1.00

Remarks *<.05 **<.01

Construct Reliability & Avg.Variance			
Latent	Construct	ρc	ρv
L1	MOB	0.8708	0.6931
L2	DOM	0.9287	0.8127
L3	SPU	0.9231	0.7091
L4	SVL	0.9693	0.9135

ρc validity > 0.60, ρv extraction >.50

For the Indirect Effects, the most were also (L2 to L4) Dominant Power (DOM) to Service Level (SVL) = 0.11, and followed by (L1 to L4) Strategic Sourcing Technique (SST) to Service Level (SVL) at 0.09.

The Reliability of observed variables valued in between 0.54 - 0.94. The highest reliabilities were factors: Cost and Flexibility (Z1, Z3) which were equally at 0.94. For the lowest reliability value was: Risk avoidance (Y4) valued at 0.54.

The Squared Multiple Correlations (R2) found that the predicted co-efficient (R2) of Service Performance Units (SPU) resulted as 0.50 or the SPU latent for the predictable variance at 50 percentages. The predicted co-efficient (R2) of Competitive Service Level (SVL)was 0.61 or this Latent variable was capable to predict variance in Service Level at 61 percentages.

Correlation Matrix of Latent variables showed that the correlation coefficient values in between 0.59 to 0.77. The highest correlated values were factors: Dominant Power (DOM) and Competitive Service Level (SVL), followed by Service Performance Units (SPU) and Competitive Service Level (SVL) at 0.71 respectively. For the lowest correlation factors were SST and SVL which were Strategic Sourcing Technique and Competitive Service Level at 0.59.

Finally, the outcomes of total 7 hypotheses for direct and indirect effects were all support the hypotheses' alternatives (All rejected H_0).

Hypothesis 1: L1 (SST) has a direct relationship to L3 (SPU)

Total effects = 0.26 (Direct Effect = 0.26)

Hypothesis 2: L1 (SST) has a direct relationship to L4 (SVL)

Total effects = 0.15 (Direct Effect = 0.06; indirect = 0.09)

Hypothesis 3: L1 (SST) has an indirect relationship to L4 (SVL) via L3 (SPU)

Total effects = 0.15 (Direct Effect = 0.06; Indirect effect = 0.09)

Hypothesis 4: L2 (DOM) has a direct relationship to L3 (SPU)

Total effects = 0.30 (Direct Effect = 0.30)

Hypothesis 5: L2 (DOM) has a direct relationship to L4 (SVL)

Total effects = 0.48 (Direct Effect = 0.37; indirect = 0.11)

Hypothesis 6: L2 (DOM) has an indirect relationship to L4 (SVL) via L3 (SPU)

Total effects = 0.48 (Direct Effect = 0.37; Indirect effect = 0.11)

Hypothesis 7: L3 (SPU) has a direct relationship to L4 (SVL)

Total effects = 0.36 (Direct Effect = 0.36)

Conclusions

For the major model (N =509), the reliability was arranged by the rank of construct reliability values: the Competitive Service Level (SVL), the Dominant Power in selection (Dom), the Service Performance Units (SPU), then the Strategic Sourcing Technique (SST) or Latent 4, 2, 3, 1. Results were 0.9693, 0.9287, 0.9231, and 0.8708 respectively.

The highest values of factor loaded were equal as: Cost and Flexibility resulted as 0.97, followed by Policy (X6), and Make (X1) at 0.92 and 0.91 respectively. The lowest factor loaded value was: Risk avoidance (Y4) with value 0.63.

Within the mediator, variables as the Service Performance Units (SPU), ranked by the most value were Rates (R2) 0.90, Responsiveness (R5) 0.86, Reliability (R1) 0.89, Resources (R3) 0.85, and Risk Avoidance (R4) 0.63 respectively. These results show the congruent for Rates (R2) to the outcome of Cost (Z1) and secondary was Responsiveness (R5) which supports the outcome of Flexibility (Z3).

Recommendations

The developing model examined invariance measurement in three countries, and the variables, and model were congruent to the exploratory data. The outcomes were well fitted and also supported to the past works, either related to lean or just in time strategy of Andersson, R., Eriksson, H., and Torstensson, H. (2006). They mentioned that once the scale

efficiency can be maximized with highly dynamic conditions that cannot be dealt with; there is no room for flexibility, focus on perfection, lean, particular market conditions at a certain period of time. The lean concept destroys the flexibility, while the just-in-time engaged in resources spending (trade off time by high-cost).

Another work of Vanichchinchai (2012, p.161, 167) investigated the firm's supply performance measurement by four sub-constructs: Cost (3 items), Flexibility (3 items), Relationship (4 items) and Responsiveness (3 items). The final outcomes showed that the most impact were Relationship (0.89), Responsiveness (0.85), Cost (0.80) and Flexibility (0.73). In his study with six-point scales were applied to evaluate the employee involvement, partnership management, and supply performance in the survey on automotive companies. Regarding to these research findings, the results from the logistics companies as Dominant power on selection was the highest impact, (the selected supplier focus), Cost (0.97), Time (0.87), and Flexibility (0.97). Hence, this illustrated model is recommended for adaptable firm's development.

Implementation and Future Research

For Practitioners, Dominant powers on selection are the main key factor for both selections on methods of strategic sourcing and selected focus on supplier selections. These powers from price, people or policy caused the direct impact and effects to the different outcomes which are: saving cost, best cost or high speed on service responsiveness, flexibility to the team's policy to achieve the higher customers' satisfaction.

For Professionals, Dominant powers were engaged in selective process as intangible, uncountable, and subjective. However , it later results as objective in form ofthe performance of a throughput. The instruction and control leads by firm management's decision. Disciplines of staff or self-confident issue against manager's instruction, caused a high-pay manager is meaninglessif he could not control his subordinates. Any wrong or bias decision making during in purchasing, own selecting prices or supplier), the developing throughput which is looking for a better cost or better quality would be difficult and be hardness in implementation.

For implementation and further research, it is recommended to identify and modify the degree of Service Performance Units (SPU)'s observed variables for which important degree may significant different in a different context or local cultures in policy and practices.

Due to the differences most concerned on the sourcing behaviors whether Make or Buy, the survey was done within Asian countries. The future research recommended exploring the same model's parameters on other zone which may differ in shades of cultures and practices such as European service providers, the United States logistics companies, etc.

The design causal relationship model confirmed and passed the invariance test for its generality (Appendix B-D) and model also endorsed by the experts in logistics service business (Appendix E).

References

Andersson, R., Eriksson, H., & Torstensson, H. (2006).Similarities and differences between TQM, six sigma and lean.*The TQM Magazine,18*(3), 282-296.

Baily, P., Farmer D., Jessop D., & Jones, D. (2005).*Purchasing Principles & Management.* (9th ed.). The Chartered Institute of Purchasing, and Supply, NJ: Prentice Hall.

Buffa, F. P. (1986)..Inbound logistics: Analysing inbound consolidation opportunities. *International Journal of Physical Distribution and Materials Management, 16*(4), 3-32. Emerald Backfiles (2007). Retrieved from http://www.emeraldinsight.com/doi/pdfplus/10.1108/eb014635

Canez, L. E., Platts, K. W., & Probert, D. R. (2000).Developing a framework for make-or-buy decision.*International Journal of Operations & Production Management, 20*(11), 1313-1330.

Cavusgil, S. T., & Das, A. (1997).Methodology issues in cross-cultural sourcing research – A primer. *Marketing Intelligence and Planning, 15*(5), 213–220.

Choy, K. L., Fan, K. K. H., & Lo, V. (2003).Development of an intelligent customer-supplier relationship management system: The application of case-based reasoning. *Industrial Management & Data System, 103*(4), 263.

Cooper, M. C., Lambert, D. M., & Pagh, J. D. (1997).Supply chain management: More than a new name for logistics. *International Journal of Logistics Management, 8*(1), 1-13.

Cooper, M. (2007). Cost and delivery time implications of freight consolidation and warehousing strategies. *International Journal of Marketing & Logistics, 14*(6), 47-67.

Coyle, J. J., Novack, R. A., Gibson, B. J., & Bardi, E. J. (2011). *Transportation: A supply chain perspective.* (7th ed.). Mason, OH: South-Western Cengage.

Dale, B. G., & Cunningham, M. T. (1983). The importance of factors other than cost considerations in make or buy decisions. *International Journal of Operation*,4(3), 43-54. Emerald Backfiles (2007). Retrieved from http://www.emeraldinsight.com/doi/pdfplus/10.1108/eb054719

Boer, D. L., Gaytan, J., & Arroyo, P. (2006). A satisficing model of outsourcing.*Supply Chain Management:An International Journal, 11*(5), 444–455.

Dugdale, H. (1985). Make or buy: Factors relevant to decision making. Profit planning – 21.*Work Study*., 18-25. Emerald Backfiles 2007. Retrieved from

Ellram, L. M. (1994). Total Cost of Ownership – An analysis approach for purchasing. *International Journal of Physical Distribution & Logistics Management, 25*(8), 4-23.

Ellram, L. M., & Maltz, A. B. (1995).The use of total cost of ownership concepts to model the outsourcing decision.*The International Journal Logistics Management, 6*(2), 55-66.

Fill, C., & Visser, E. (2000). The outsourcing dilemma: A composite approach to the make or buy decision. *Management Decision, 38*(1), 43-50.

Giunipero, L. C., & Monczka, R. M. (1997).Organizational approaches to managing international sourcing. *International Journal of Physical Distribution & Logistics Management, 27* (5/6), 321-336.

Green, R. F., Zimmerer, T. W., & Steadman, M. E. (1994).The role of buyer sophistication in competitive bidding.*Journal of Business & Industrial Marketing, 9*(1), 51-59.

Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004).A framework for supply chain performance measurement.*International Journal Production Economics, 87*, 333–347.

Handfield, R. B., Monczka R. M., Giunipero L. C., & Patterson J. L. (2009). *Sourcing and supply chain management.* Boston, MA: South-western College.

Hemsworth, D., Sa´nchez-Rodrı´guez, C., & Bidgood, B. (2005).Determining the impact of quality management practices and purchasing-related information systems on purchasing performance: A structural model.*The Journal of Enterprise Information Management, 18*(2), 169-194.

Holter, A. R., Grant, D. B., Ritchie, J., & Shaw, N. (2008).A framework for purchasing transport services in small & medium size enterprises: Purchasing transport services. *International Journal of Physical Distribution & Logistics Management, 38*(1), 21-38.

Hunter, P. (1972). To own or lease—Which way for container operations? *International Journal of Physical Distribution,* Emerald Backfiles 2007, 64-67. Retrieved from http://www.emeraldinsight.com/doi/pdfplus/10.1108/eb038854

Lambert, D. M., & Pohlen, T. L. (2001).Supply chain metrics. *The International Journal of Logistics Management, 12*(1), 1-19.

Leenders, M. R., Fearon, H. E., Flynn, A., & Johnson, P. F. (2002).*Purchasing& Supply Chain Management.* (12th ed.). New York, NJ: McGraw-Hill Irwin.

Lyons, P. R. (2015). Core self-evaluation can help in making better recruitment and selection choices. *Human Resource Management International Digest, 23*(3)**,** 17-19.

Lysons, K., & Farrington, B. (2006). *Purchasing& Supply Chain Management.* (7th ed.). Pearson, New York, NJ: Prentice Hall.

Matear, S., & Gray, R. (1993).Factors influencing freight service choice for shippers and freight suppliers. *International Journal of Physical Distribution & Logistics Management, 23*(2), 25-35.

McIvor, R. T., & Humphreys, P. K. (2000). A Case-Based Reasoning approach to the make or buy decision. *Integrated Manufacturing Systems, 11*(5), 295-310.

Min, H. (1994).International supplier selection: A multi-attribute utility approach. *International Journal of Logistics Management, 24*(5), 24-33.

Mohamed, A. A., & Jones, T. (2014).Relationship between strategic management accounting techniques and profitability – A proposed model.*Measuring Business Excellence, 18*(3), 1-22.

Parasuraman, A., Zeithaml, V., & Berry, L. (1985). A conceptual model of services quality and its implication for future research. *Journal of Marketing,* 49(4), 41-50.

Probert, D. R. (1996).The practical development of a make or buy strategy: The issue of process positioning. *Integrated Manufacturing Systems, 7*(2), 44–51.

R+L Global. (2015). *International Logistics.*Retrieved from http://www.rlglobal.com/about /case-studies/international-logistics

Ramsay, J., & Wilson, I. (1990).Sourcing/Contracting strategy selection.Sourcing/Contracting strategy.*International Journal of Operations & Production Management, 10*(8), 19-28.

Rao, K., &Young, R. R. (1994).Global supply chains: Factors influencing outsourcing of logistics functions. *International Journal of Physical Distribution & Logistics Management, 24*(6), 11-19.

Southwood, G. (1995). Outsourcing your information resources.*Records Management Journal, 5*(2), 101-113.

Spina, G., Campanella, N., & Codeluppi, G. (2000).Make vs buy vs partnership in distributing commodities: A case study and methodology. *Integrated Manufacturing System, 11*(2), 112-120.

Thai, V. V. (2007). Service quality in maritime transport: Conceptual model and empirical evidence. *Asia Pacific Journal of Marketing and Logistics, 20*(4), 493-518.

Thai-Aec. (2015). *10 countries in AEC*. Retrieved from http://www.thai-aec.com

Thankdenchai, P. (2013). Service performance unit for logistics benefits measurement: A conceptual framework of 5Rs model. In Yurarach (Ed.), *Research and Innovations for Sustainable Development2013*.Proceedings of the 8th Conference of Sripatum University (pp. 1358-1367). Bangkok, Thailand.

Thankdenchai, P. (2015). Relationship between strategic sourcing techniques and profitability for competitiveness – A proposed model.In *The BMIC2015 Business Management International Conference: Moving towards Business and Economic Sustainability*. Conference proceedings of Faculty of management and tourism.Burapha University, Chonburi, Thailand.Retrieved fromhttp://www.bbs.buu.ac.th/bmic2015

Thankdenchai, P., & Pasawat, P. (2015).Nestlé Thailand's best practice, a support idea on support best practice VMI: An enabler of conceptual collaboration. *AU GSB e-Journal, 8*(1), 85-95. Retrieved from http://www.assumptionjournal.au.edu/index.php/AU-GSB/article/view/1458

The World Bank. (2012). Connecting to compete 2012: The logistics performance index and its indicators.In J. Arvis (Ed.), *Trade Logistics in the Global Economy* (pp. 1-56).NW, Washington DC.

Vanichchinchai, A. (2012).The relationship between employee involvement, partnership management & supply performance: Findings from a developing country. *International Journal of Productivity and Performance Management, 61*(2), 157 – 172

Whyte, J. L. (1993). The freight transport market: Buyer-seller relationship and selection criteria. *International Journal of Physical Distribution & Logistics Management, 23*(3), 29-37.

Wilding, R., & Juriado, R. (2004).Customer perceptions on logistics outsourcing in the European consumer goods industry.*International Journal of Physical Distribution & Logistics Management, 34*(8), 628-644.

Yount, R. (2006). 12developing scales, Research design and statistical analysis. In Christian Ministry (Ed.),*Research Methods* (4th ed., pp. 1-12).Retrieved from http://www.napce.org/documents/research-design-yount/12_scales_4th.pdf

Yuttapong, P., & Sataporn, A. (2010). Performance development method for the aviation supply chain. In U. Laptanes (Ed.), *The 2nd International Conference on Logistics and Transport & the 1st International Conference on Business and Economics: Managing Finance and Risk in Global Supply Chain: ICLT 2010, ICBE 2010* (pp. 1105-1113). Queenstown, New Zealand.

Zammori, F., Braglia, M., & Frosolini, M. (2009). A standard agreement for vendor managed inventory. *Strategic Outsourcing: An International Journal, 2*(2), 165-186.