Logistics Service Quality from the Perspective of Small and Medium Enterprises in Songkhla, Thailand

Comfirmatory Factor Analysis Result

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Abstract—**The aim of this study is to explore the confirmatory factor analysis (CFA) result of logistics service quality scale developed by Juga, Juntunen, and Grant [1]. The validity and reliability assessment of the scale were performed on 198 Small and Medium Enterprises in Songkhla, Thailand chosen randomly from the directory of Department of Business Development, Ministry of Commerce. The CFA was carried out. The factor structure of Songkhla logistics service quality scale could be determined. The CFA result revealed that the original Songkhla logistics service quality consisted of 9 items, actually consisted of 7 items, while the three factor structure of the original scale remained the same.**

Keywords—**logistics service quality, SMEs, Thailand**

Introduction

Small and medium enterprises (SMEs) play an important role in developing Thailand's economy because they make up a large portion of business activities. Defined as companies with no more than 200 employees and THB 200 million in assets. SMEs contributed to 37% of the gross domestic product (GDP), hired 75% of the workforce and denoted to 28% of Thailand's export in 2010 [2].

The logistics contribution to the firm competitive advantage is significant in both efficiency (cost) and effectiveness (service) [3]. A global logistics survey indicates that 80 per cent of the firms have outsourced some of their logistics activities. Buyers rate service quality as the most important factor when choosing a third-party logistics (3PL) service provider [1].

This paper focuses on perceived logistics service quality of SMEs in Songkhla, Thailand towards their main 3PL service provider. The purpose of the study is to identify the dimensions of logistics service quality in 3PL outsourcing relationship. Although survey often conducted to measure logistics service quality in business market, very little research had been done to 3PL services form the SMEs' perspective in Thailand. This study aims to fill this gap.

Literature Review

Logistics service quality scale of this paper was developed and validated by Juga, Juntunen, and Grant [1] to determine the dimensions of service quality in 3PL towards service provider in an outsourcing relationship. Based on the previous research mentioned above, it is posited that perceived logistics service quality in 3PL is formed of three quality dimensions including operational service quality, technical service quality and personal service quality.

Methodology

The population of this study was the SMEs in Songkhla province, Thailand, which registered in the directory of Department of Business Development, Ministry of Commerce before 2011. This listing comprised 5,364 firms in Songkhla. A total of 600 firms were randomly selected.

The selected SMEs were represented by their owner-managers. A total of 600 questionnaires were with a cover letter and pre-paid reply envelop were distributed to the executives. After two reminders were given, 203 responses were successfully collected in two months. Cases with missing value were subsequently dropped from the analysis, resulting in the acceptable 198 reponses. This represented a response rate of 33 per cent, which compares favorably to response rates for other recent similar studies [4], [5].

The SMEs demographic data was analysis using SPSS. The CFA was tested using AMOS. Goodness of fit tests help make a decision about accept or reject the model.

Findings and Discussion

A total of 198 questionnaires were valid and acceptable for data analysis in this study. While the response rate of 33 per cent approximates accepted response rate for this type of study [1]. The author examines the non-response bias following Armstrong and Overton [6]. The late responses obtained after follow-up calls and reminders were compared to the early responses on demographic variables. There were no differences between this two groups (Chi^2 Statistics: p-value > 0.05). It's concluded that the sample has no non-response bias.

A first characterization of the SMEs examined reveals that they are small sized companies (57%) with asset of no more than THB 30 million or 15 employees. In relation to sector, the companies represent manufacturing sector (21%), wholesaling/retailing sector (41%) and service sector (38%). The forms of business are sole proprietorship (54%), partnerships (14%), private company (28%) and community enterprise (4%).

The evaluation of operational, technical and personal service quality are well over five on a seven-point scale as shown in Table 1, then, the CFA was performed to determine the factor structure of lgistics service quality of 3PL service provider. The analysis was initiated with 9 items As a result of

CFA, conducted in order to assess the extent to which the 9 items in the original scale and the three-factor structure determined and data gathered with this study fit together, it was found that the 1st and 4th items displayed loading tendencies towards other latent variable in addition to those latent variables already anticipated theoretically and these items were removed from the logistics service quality scale to create conceptual clarity. The other 7 items and the path diagram concerning these items' factor loading were presented in Figure 1. The factor loading of the items left in scale ranges between 0.82 and 0.94, while the operational dimension and technical dimension consisted of two items each, only personal dimension consisted of three items.

TABLE I. STATISTICS OF LOGISTICS SERVICE QUALITY

		Mean	SD
OSERV	Operational service		
capacity	Ability to provide sufficient capability	5.40	1.13
quick	Ability to offer service promptly	5.55	1.02
schedule	Ability to keep schedules	5.58	1.10
TSERV	Technical service		
physical	Technical quality of technical resources	5.57	1.08
itsys	Technical quality of information systems	5.45	1.17
itflow	Problem-free electronic communication	5.40	1.25
PSERV	Personal service		
expert	Service-minded of the personnel	5.40	1.29
service	Accessibility of personnel	5.61	1.17
contact	Expertise of personnel	5.69	1.14

A CFA was performed to examine the validity of the three logistics serve quality dimension (OSERV, TSERV, PSERV). Despite satisfactory value of Cronbach's alpha coefficients (OSERV 0.87, TSERV 0.82, PSERV 0.91), the CFA showed an unacceptable statistically fit of the three dimensions (χ^2 = 68.41, df = 24, p = 0.00, RMSEA = 0.10). Thus, the model was re-specified by eliminating two observed variables with weakest factor loadings ("capacity" and "physical") from the model. The resulting model was still slightly below the requirement of statistical fit (p < 0.05). After studying the modification indices produced by AMOS, the errors correlations of two observed variables ("itsys" and "expert") were set to be free. This modification produced a model with good statistical fit dimensions (χ^2 = 12.44, df = 10, p = 0.26, RMSEA = 0.04) as shown in Figure 1,

The CFA model in Figure 1 shows some issues of logistics service quality in 3PL relationships. It finds that operational service quality is divided into two distinct aspects of performance: a time-related aspect indicating ability to keep schedules and ability to offer service promptly and a volume-related aspect indicating ability to provide sufficient capability. Although both aspects are important for service buyers they cannot be treated as a single construct. Only the time-related aspect is left in the model to describe the operational dimension of logistics service quality. The information technology-related aspect reveals to form a dimension of its own which is distinct from other physical resources. There exists a close relationship between the technical and personnel dimensions of logistics service quality, which indicated by the high correlation coefficient, while the operational dimension reveals a considerably lower correlation with other two dimensions.
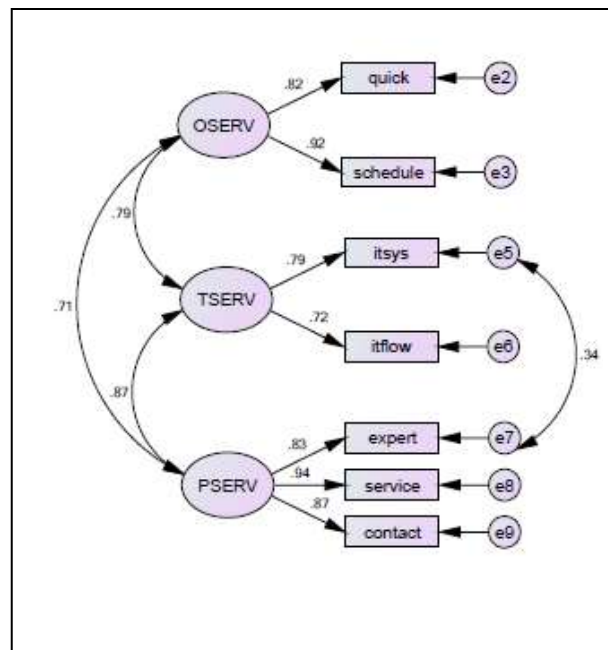
Conclusion

A CFA was carried out in adapting the logistics service quality scale [1] into Songkhla province, Thailand. It can be concluded some support for validity of the three-dimensional logistics service quality. However, there are the limited numbers of indicators measuring the logistics service quality and the need for model modifications, more future research in different geographic setting and time of studying is need to obtain more valid and reliable constructs measuring different aspects of logistics service quality of 3PL service provider in outsourcing relationship.

For the managerial implication, it should be concerned that the factor loadings of different logistics service dimensions do not mean that technological aspects are less important for service buyer. In the contrary, it needs more improvement in technology to improve perceived logistics service quality.

Acknowledgment

References

[1]   J. Juga, J. Juntunen, and D.B. Grant, "Service quality and its relation to satisfaction and loyalty in logistics outsourcing relationships," MSQ, 2010, vol. 20, pp. 496-510.

[2]   The Board of Investment of Thailand, "OSMEP helps SMEs achieve potential in competitive region," Retrived September 18, 2014, from http://www.boi.go.th/tir/issue/201205_22_5/3.htm, 2012.

[3]   J.T. Mentzer, S. Min, and L.M. Bobbitt, " Towards a Unified Theory of Logistics," IJPDLM, 2004, vol. 34, pp. 606-627.

[4]   J.T. Mentzer, D.J. Flint, and J.L. Kent, . "Developing a logistics service quality scale." JBL, 1999, vol. 20, pp. 9-32.

[5]   T. Tellefsen, and G.P. Thomas, "The antecedents and consequences of organizational and personal commitment in business service relationships." Ind Market Manag, 2005, 34, pp. 23-37.

[6]   J.S. Armstrong, and T.S. Overton, "Estimating Nonresponse Bias in Mail Surveys." J. Mark. Res., 1997. Vol. 14, pp. 396-402.

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