

Methodological Considerations in a Quantitative Study of

**The Effect of Logistics Service Value and Relationship Quality on
Financial Performance**

Evidence from Multimodal Transport Service in Thailand

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Abstract

This paper examines the methodological consideration in developing a research on understanding the effects of logistics service value and relationship quality on financial performance within multimodal transport service industry in Thailand. As this research adopted the positivist paradigm in understanding a particular phenomenon from shippers' perspective, selections of methodology such as qualitative and/or quantitative analysis were to be considered. Along with a pre-established theoretical model, self-administered questionnaire survey was used to test the validity and fitness of the model. In this cross-sectional design research, statistical analysis tools are considered as the most appropriate means of data analysis.

Keywords: Logistics service value, relationship quality, positivism, abductive approach, guanxi, financial performance, multimodal transport, structural equation modelling.

1. Introduction

As trade and transport networks were taking shape through a series of developments, together with growth of containerised transport and improvement of cargo transfer system between different modes, modern transport practices such as multimodal transport has a significant impact on firm performance (UNCTAD, 2008; SLA, 2008; UNCTAD 2003; Banomyong and Beresford, 2001). Shippers and consignees appreciated the convenience, simplicity, security and efficiency of multimodal transport services and are willing to pay for their benefits. Transport operators quickly recognised the market potential for integrated logistics and transportation systems and move decisively into providing value-added services through multimodal transport (Kindred and Brooks 1997).

Value-added services provided by multimodal transport operators (MTO) are considerably broader than traditional service offered by freight forwarders. As the liability of MTO in transport of goods increases, the flexibility of service functions also increases in providing a wider range of service activities (UNCTAD, 2003; SLA, 2008). Inevitably, collaborative partner-relationships between shippers and operators have received considerable attention in determining the effectiveness of multimodal transport logistics in firm performance. The term “relationship” as a construct in the context transport has always been a critical pillar in strategic business environment (Gibson, *et al*, 2002). However, according to Zacher, *et al*. (2010), the clear distinction between relationship and performance constructs is lacking and has not been conclusively established. Athanasopoulou (2009) has also addressed that there are no universally accepted frameworks for measuring partner-relationship in the current body of researches.

In the Asian context, especially in China or other culturally-alike countries, the term “relationship” is an ambiguous business concept, which embraces more than just elements of long-term or short-term relationships seen in the western context. The term “guanxi”, briefly translated as personal connections/relationships, is deeply embedded in the mindset of most Asian countries and in every aspect of their personal and organisational interactions. This has highlighted one of the differences between Western and Eastern management literature; in the west, the concept is poorly conveyed as words do not explain the full meaning and ubiquity of the guanxi concept (Davies, *et al* 1995). Thus, it is worth a while to research the impact of logistics services and relationship quality on financial performance under the multimodal transport environment.

2. Research Design

Common measurements in logistics and transport research is comprise of commercial elements, i.e. transport cost, delivery time and inventory turnover, however, a new trend of logistics and transport research has also welcomed other metaphorical concepts such as value chain and causality of behaviour activities to scientific study (Aastrup and Halldorsson, 2008). With the emergence of these concepts, the identification of appropriate methodology is needed to confine these newly evolved research disciplines (Yin, 2003). In academic research, methodology is a body of knowledge that allows a researcher to underpin the research questions through use of various types or evidence that can be gathered (Clark, *et al.* 1984). According to Avison and Fitzgerald (1995, p. 63), “*a methodology is a collection of procedures, techniques, tools and documentation aids...but a methodology is more than merely a collection of these things. It is usually based on some philosophical paradigm, otherwise it is merely a method, like a recipe*”. Therefore, in order to identify presuppositions and consequence to research advances, research methodology is important to any study (Miller, 1983).

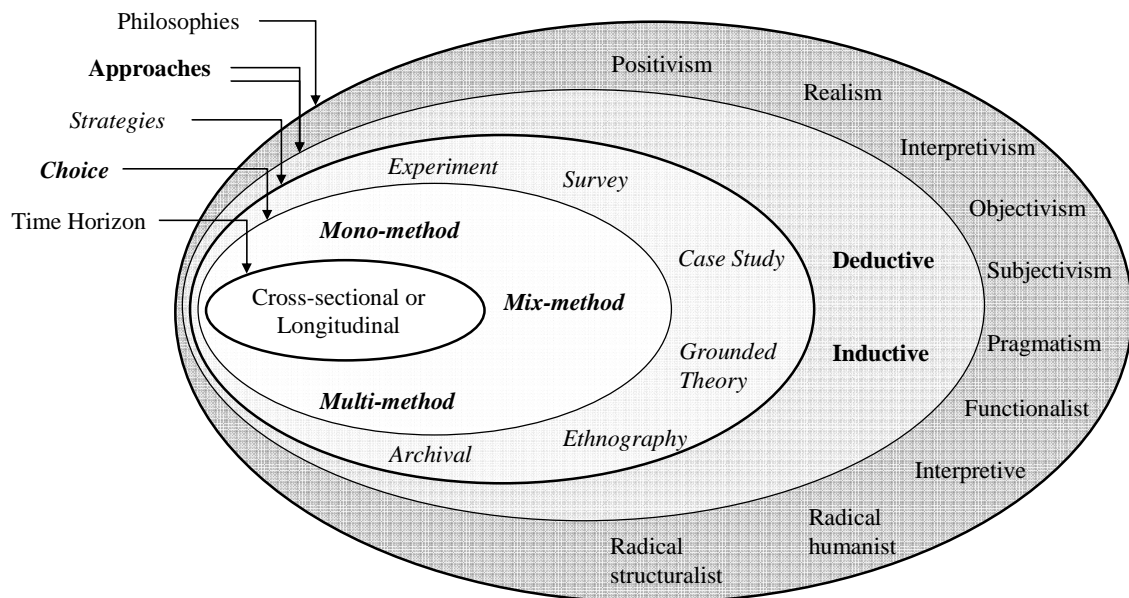
According to Naslund (2002), selection of research method should be based on the research paradigm due to the fundamental nature of the research processes which are generally involved with a particular research strategy and method. The following section presents the philosophical paradigm and approach of the research which highlights the influence of research method selection in this research.

2.1 Research Philosophical Paradigm and approach

The axiom of “knowledge”, driven by research paradigms, can be explained by the branches of philosophy known as ontology, epistemology and methodology (Guba and Lincoln, 2005; Bryman and Bell, 2007). Mason (2002) and Thomas (2004) have stated that the concept ‘ontology’ is a misty concept to define due to the nature and essence of social elements, which are involved in understanding ‘the chain of being’. In simpler terms, ontology is concerned with the ‘reality’ that researchers aimed to study. However, in an epistemology position, the theory of knowledge underpins the legitimacy and the framework for a process which involves in working out exactly how the research would count as evidence of knowledge of social elements (Mason, 2002). In contrast to ontology, epistemology is regarded as ‘knowing’ through imitation of principles, procedures and ethos of the natural sciences (Bryman and Bell, 2007).

As to methodologies, these are regarded as the tools of conducting research studies. The epistemological and ontological assumptions of the research will consequently influence methodological decisions. According to the research topic, the criticality of choosing the ‘right’ research tool is essential in formulating the actual research itself. Prior to this task, identification of researcher’s ontological and epistemological stances would significantly respond as a blueprint/guidance for the researcher (Mason, 2002; Frankfort-Nachmias and Nachmias, 1996). Saunders, *et al.* (2007) portray the research process as an ‘onion’ where assumptions must be made at each individual stage of research approach, referred to as layers of the ‘onion’ (Figure 1).

Figure 1: The Research Onion



Source: Saunders, *et al.* (2007)

Guba and Lincoln (2005) suggest that there are four main research paradigms which can be explained through ontology, epistemology and methodology positions namely: positivism, post-positivism, critical theory and constructivism. This study recognises the multimodal transport service as an objective and external entity, and impact of logistics service value and relationship quality on firm performance takes place independently of researcher. Therefore, in line with the positivist paradigm, a deductive research would be an applicable approach when considered against its philosophical background.

The positivism approach, credited to Auguste Comte during the early 19th century stated, “*the only authentic knowledge is scientific knowledge*” (Giddens, 1974). Other key authors including David Hume and Immanuel Kant, who have advocated the concept that “positive knowledge is based on natural phenomena and their properties and relations as verified by the empirical sciences” (Encyclopaedia of Marxism: Glossary of People, 2008). This creates an emphasis on the knowledge and phenomenon of changes in the social world, which could be sensed and explained through natural scientific phenomenon.

As much of the debate is based on how methods developed in natural science are transferable to social science, positivist approach gives a clear sense of separating subjective and objective data interpretation (McKensie, 1997). Under this assumption, it is to be believed that social phenomena could be scientifically observed and measured. Along with the emphasis on objectivity, the attained knowledge through scientific methods would expose greater strength in terms of reliability. Furthermore, the positivist approach asserts that results based on data set would be bias-free; bias is commonly caused by personal interpretations and values that may influence conclusions drawn from a set of data.

Qualitative researchers are greatly influenced by different intellectual traditions, whereas quantitative researchers are intensely influenced by a natural science approach of what should count as acceptable knowledge (Bryman and Bell, 2007). With the author’s aim to create an objective knowledge, the research falls into the positivist paradigm. In retrospect, the three main paradigms (epistemology, ontology and methodology) have demonstrated the philosophical ways of knowing and understanding the social world. Acknowledging the parallel collaboration of these three branches would help researchers to better define the scope and the focus of the research topic.

2.2 Research Strategy and Time Horizon

As the researcher adopts a positivistic view, this research focuses on hypothesis testing through a pre-established conceptual framework. Given the nature of the research objective and time constraint, this study employs a cross-sectional design. According to Bryman and Bell (2007), cross-sectional design is built on the idea of social survey which connects in people’s mind with questionnaires in regard with two or more variables. Data was collected from interviews and a questionnaire survey at a specific point in time but the methods were conducted with different sample groups to ensure the generalisability of the research. The

time given for semi-structured interview and questionnaire survey was one month, exclusively. However, in order to reduce non-bias response, the questionnaire survey was sent out again 2 weeks after the first batch. The total time period in conducting the questionnaire survey was 4 weeks.

3. Data Collection Methods

This research has engaged in a multi-method approach at each stage of data collection. Regarding methodological triangulation, the use of both quantitative and qualitative methodologies lends greater empirical support to the theory in question (Mentzer and Kahn, 1995). Following Mentzer and Kahn's (1995) work, Mangan, *et al.* (2004) has proposed a three-phase triangulated research methodology to structuralise the use of both quantitative and qualitative methods. Therefore, following to Mangan, *et al.*'s three-phase triangulated research methodology, three stages of data collection are employed (Magan, *et al.* 2004).

Phase 1. Desk-based critical literature analysis was carried out to generate a set of semi-structured interview questions used in the initial pilot study. Prior to implementation of these sets of questions, substantive justification of the questions was made with three academic researchers in the field of logistics and transport discipline. The interviews took place in Thailand with 10 prospective respondents. The output of this allows researcher to encapsulate general phenomena in the field of the research and trends in multimodal transport. This also helps to justify the reasoning behind the motivation of this research.

Phase 2. From the results from phase 1, a conceptual theory was then generated with reference to the existing literature. Hypotheses were worked up along with identification of constructs and measurements, and a set of self-administered questionnaires was distributed. A total of 1100 sets of questionnaires were distributed with an expected maximum response rate of 25 per cent. Data collected from the questionnaire were then analysed using a quantitative model. As the researcher views logistics services and relationship qualities objectively, using quantitative analysis allows the conceptual model to be more rigorous and robust.

Phase 3. Results of both phase 1 and 2 are then compared, refined and validated with two independent academic researchers and two practitioners.

The output of this three-phase triangulated research methodology is to highlight the benefits of using both quantitative and qualitative methodologies in the context of logistics and transport research. Regarding the deductive theory, which underpins research based on existing theory, this research has faced situations where the proposed research model does not agree with the existing theory (Saunders, *et al.* 2007). Therefore, by means of using interviews with shippers in Thailand, this research adopts an abductive approach which enables the researcher to generate new concepts and development of theoretical models, rather than confirmation of existing theory (Dubois and Gadde, 2002).

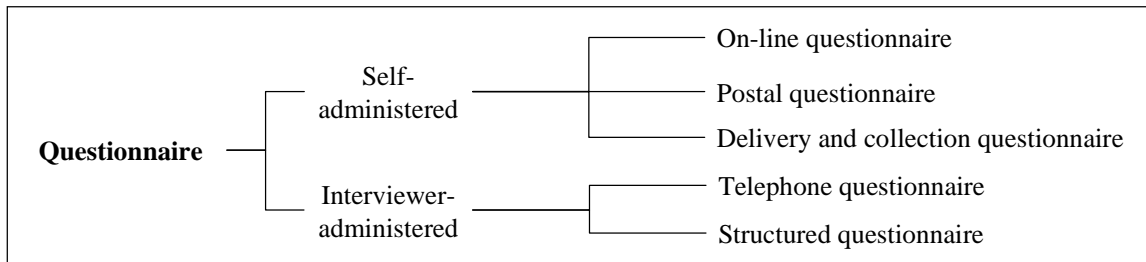
3.1 Research Sampling

Prospective informants are people who deal with multimodal transport as a part of their business operation in Thailand. According to Thailand's export/import-related database, a list of shippers is found in the Thai National Shippers' Council (TNSC), which is widely accepted in both government and private sectors. The main purpose of TNSC is to assist shippers or exporters to promote and protect their interests in the global market arena. The council has been providing consultation and negotiation services domestically and internationally. According to TNSC's list, 28 different categories are found based on the characteristics of exported goods. There were total of 2,777 shippers listed in 2009. Due to time and budget constraints, a sample of 1,000 respondents will be selected based on their registered capital investment figures. The researcher believes that it should represent more than 80 per cent of Thai export in terms of value and volume.

3.2 Questionnaire Development Process

Because of the number of desired feedback, visiting every prospect respondents would be impossible due to budget and time constraints. Therefore, in this study, a questionnaire survey was selected as the main empirical data collection method. According to Maylor and Blackmon (2005), a survey is a useful technique to capture facts, opinions, behaviours or attitudes from a range of respondents. However, according to Saunders, *et al.* (2007), it is worth noting that there are various types of survey methods that should be taken into account when implementing this specific method (Figure 2).

Figure 2: Types of Questionnaire Method



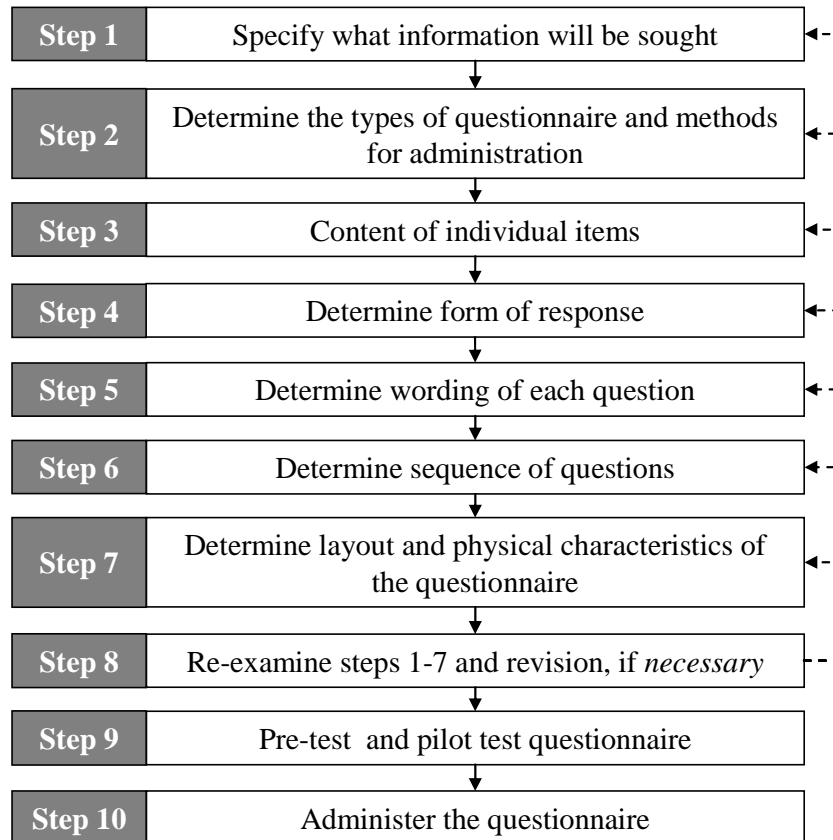
Source: Saunders, *et al.* (2007)

First of all, there are two main streams of questionnaire, namely: self-administered and interviewer-administered. The main difference between these two is the involvement of an interviewer. In the self-administered version, the questionnaire is to be completed by the prospective respondent without any aid from the interviewer. On the other hand, interviewer-administered requires verbal or face-to-face contact between the interviewer and the interviewee such as telephone questionnaire or structured face-to-face interview or questionnaire (Maylor and Blackmon, 2005). In most cases, the interviewer-administrated questionnaire is regarded as one of the most common techniques used in all types of business and management research (Maylor and Blackmon, 2005; Aastrup and Halldorsson, 2008). Regarding its flexibility, focusing on specific subject and possible extension of its meaning has become a general aim of this particular technique. This method enables researchers to gain more freedom to probe beyond the answer through a form of dialogue with the respondent and to collect additional information (May, 2001; Bryman and Bell, 2007). However, this particular method is time and cost consuming when dealing with large sample and especially when the prospective respondents are geographically dispersed. Alternatively, the self-administered method would be more advantageous over the latter in terms of convenience (time, cost and location for both interviewer and interviewee) and as it is less obstructive (absence of interviewer effects) to interviewers (Bryman and Bell, 2007). In self-administered questionnaires, several disadvantages could also be found, such as: lack of clarification when needed and less opportunity to collect additional data (Maylor and Blackmon, 2005).

Along the three self-administered methods, the postal questionnaire was adopted rather than on-line questionnaire or delivery and collection questionnaire. According to Kaplowitz, *et al.* (2004), postal or mail survey would have typically 11 per cent more response rate when compared with on-line survey. With regard to the limitation of this research, addressed in the

earlier section of this paper, postal survey would be likely to gain a higher response rate than on-line survey. It should be noted also that, since the work of Kaplowitz, *et al.* (2004), many more on-line survey have been launched, probably resulting in a further reduction in response rate due to “survey fatigue” on the part of the recipient. Figure 3 illustrates the process of questionnaire development.

Figure 3: Questionnaire Development Process



Source: Churchill and Iacobucci (2002); Maylor and Blackmon (2005)

3.3 Translation and Pre-test Procedures

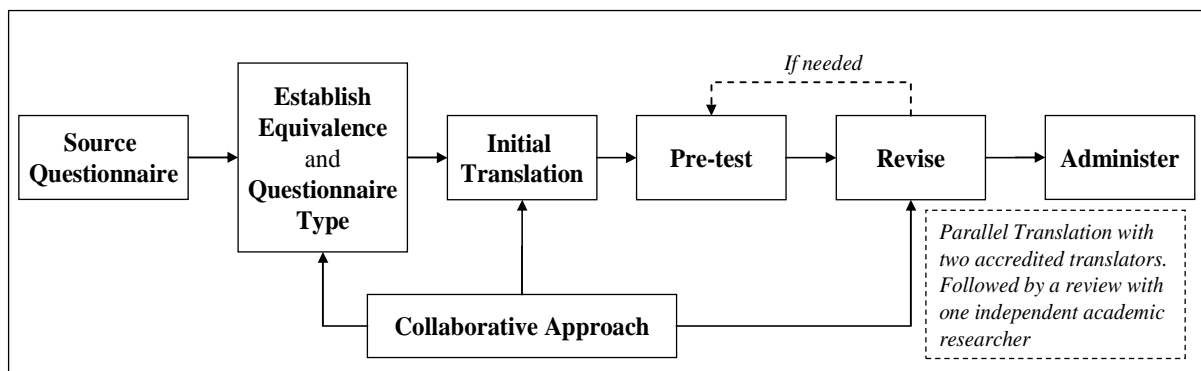
As the questionnaire will be distributed in Thailand, a Thai translated version of the questionnaire was needed. To avoid any ambiguity and potential confusion in the translated version, a parallel translation method was used to achieve equivalent meaning with the original English-version. According to Hambleton (1993), the parallel translation method has been a preferred method for cross-cultural studies which aimed to achieve equivalent meaning from the two versions. As an extension of parallel translation method, collaborative approach was suggested to ensure that different points of view are represented (Douglas and Craig, 2007). As the questions in the survey are related to socioeconomic, behavioural and

attitudinal data, translator with knowledge of local convention and cultural context are required to identify and resolve issues of construct equivalence. Therefore, the original English-version questionnaire was sent to two national credited translators in Chulalornkorn University who each hold a PhD in English linguistics in Thailand. This was followed-up by a meeting with the translators and an independent reviewer, in the field of multimodal transport research, to decide on the final version. Amendments were made accordingly until all members of the translation team were satisfied.

3.4 Pre-testing

The original English-version questionnaire was reviewed by four British scholars and one Taiwanese scholar who all hold PhDs in the area of transport and logistics management. Two of the British scholars and the Taiwanese scholar hold a professorial position and one of the British scholars holds a reader position and the other is a senior lecturer, all in a well-known national university. The aim of this is to validate the questionnaire and to avoid the potential confusion of each individual question which might lead to misinterpretation of the data. The translated version was then pre-tested with selected potential informants. Pre-testing is an important step where the researcher can find problems of comprehension or meaning that were not identified previously (Douglas and Craig, 2007). The results of the pre-testing of the questionnaire were sent to another independent academic researcher who holds a degree in logistics and supply-chain management for suggestions and opinions. The collaborative and iterative questionnaire translation process is illustrated in Figure 4.

Figure 4: Collaborative and Iterative Questionnaire Translation Process



Source: Adapted from Douglas and Craig, (2007)

4. Data Analysis Methods

Considering the previous description of this research, it can be concluded that this research is standing on a positivist paradigm where the researcher recognises the multimodal transport service industry as an objective and external entity, and the integration of value and relationship quality are independent of each other. In examination of multiple causal relationships incorporating both unobserved and observed variables in social science, implementations of statistical techniques are the primary tools for analysing large quantity of data (Hair, *et al.* 2010; Frankfort-Nachmias and Nachmias, 1996).

In alignment of the research objective: examining the effect of logistics service value and relationship quality on financial performance: evidence form multimodal transport service in Thailand, and data collected from the questionnaire survey, a subtle analytical technique is needed to test pre-established hypothesis and to determine the over-all fitness of an interrelated multiple relationships.

According to Hair, *et al.* (2010), structural equation modelling (SEM) is considered as the most appropriate analytical technique which estimates the multiple and interrelated dependence relationships. SEM also embraces unobserved concepts which are termed constructs, latent variables and factors. Therefore, in this research, SEM was adopted.

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