The factors affecting Logistics Service Quality

Case study at Saigon New Port Logistics (SNPL), Vietnam

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Abstract:
This study is developed with the objectives of identifying factors affecting logistics service quality and measuring quantified effects of these factors in the case study of Saigon New Port Logistics Company. A research model was deployed with Logistics Service Quality as the dependent variable and four independent variables including personnel quality, information quality, order quality, and timeliness. A questionnaire survey was developed and it was given to the customers of the company. The sample size is 100 people who are the customers of the company. A data collection process is established with the questionnaire distributed by email. There were 100 responses obtained and the data was inputted into data analysis process, including descriptive statistics, reliability test, explanatory factor analysis, and linear regression. Descriptive statistics provide useful information related to demographic characteristics of the respondents, including location of the head quarter, number of years since they are established, the net profit margin, and the logistics cost as percentage of the total operating cost. The result revealed that the customers of SNPL are mostly based in Hanoi and HCMC and most of them have operating time less than 5 years. The net profit margin and the logitics cost percentage of total operating cost are both captured. Preliminary analysis was generated with reliability test and exploratory factor analysis. The result obtained showed that all factors which are captured in the research model satisfy the requirements. Linear regression shows that personnel quality, information quality, timeliness, and order quality explain for 56.2% of variance of logistics service quality. There was no difference between information quality, order quality and timeliness. In addition, personnel quality seems to be slightly less important. Each, however, independently contributed to explain LSQ.

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CONTENTS

Figures

Tables

1 INTRODUCTION

1.1 Background of the study

The logistics industry has developed in Vietnam over 50 years with the very first activities conducted during the 1970s. Stoxplus (2017, pp. 1) provides a historical roadmap for the development of logistics industry in Vietnam. It is highlighted that Vietnam's logistics industry has firstly developed with the participation of manufacturers distributors. The second period of development happened during 1970s-1980s when there were more logistics services established, including asset operation and asset intensive transportation services. From 1990s to 2000s, Vietnam's logistics industry was upgraded with the development of contract logistics and asset intensive non-transportation services. For the next ten years, some consultant services were introduced and developed in Vietnam with the objective of bringing optimal logistics solutions to logistics firms. The next wave emerged after 2010 with the appearance of integrated supply chain solution providers.

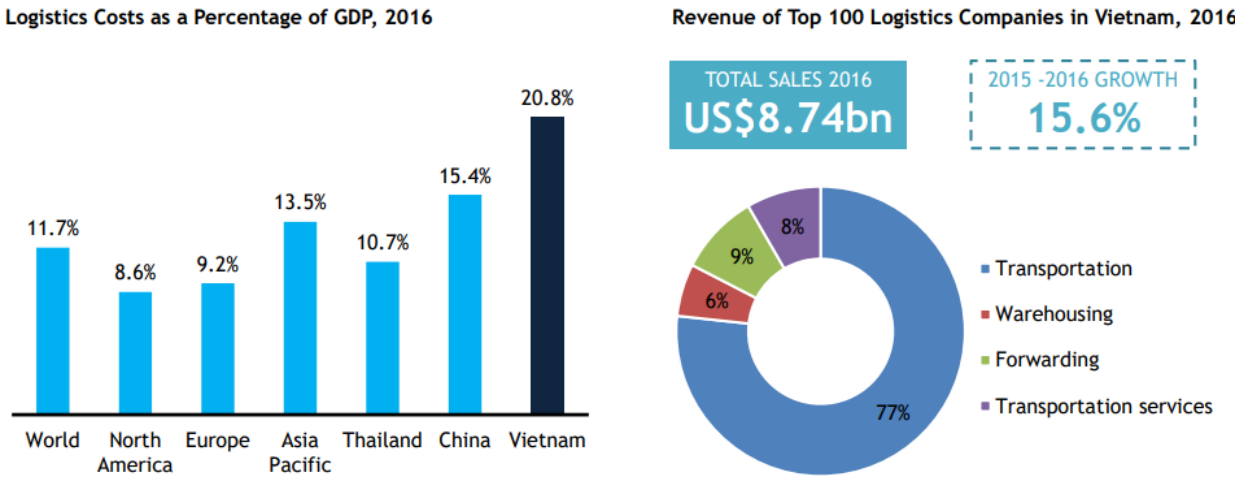

Figure 1: Logistics Cost and Revenues, 2016
Source: Stoxplus (2017)

The development of Vietnam's logistics industry was reflected through logistics cost and revenues. According to Stoxplus (2017), total revenues from the top 100 logistics

firms in Vietnam was USD 8.74 billion in 2016 with an annual growth rate of more than 15 %. The major contribution to logistics revenues of these firms was from transportation while other logistics services (i.e. warehousing, forwarding) are less than 10 %. Although logistics industry has a high growth rate, it is important to notice that Vietnam has much higher logistics costs compared to other countries worldwide (Stoxplus, 2017, pp. 1). In the end of 2016, the logistics cost as a percentage of GDP of Vietnam is 20.8 % and it was much higher than the two neighboring countries of Thailand (10.7 %) and China (15.4 %).

1.2 Problem formulation

This study is developed on some research problems. First, this study is developed for Saigon New Port Logistics (SNPL) which is known as a logistics firm in the south of Vietnam. The firm started doing business in 2013, right after the global economic recession began to recover. The main businesses of SNPL are to provide cargo loading services, multi-modal transportation services, salvage pilot services, and maritime-related services. SNPL is considered as one of the leading logistics firm in Vietnam with the market share more than 50 % of total logistics volume. However, the logistics managers at SNPL do not know about the current Logistics Service Quality level given that there is no official measurement carried out.

Second, there is much empirical evidence which has been developed to measure Logistics Service Quality in different firms in Vietnam. Vinh (2018, pp. 1) has developed a qualitative study about Logistics Service Quality of maritime firms. Vinh (2018, pp. 1) identified the importance of logistics process. Limbourg et al. (2016, pp. 123) have established a qualitative study about the effects of tangibles, reliability, responsiveness, empathy, and assurance factor on Logistics Service Quality in Da Nang City of Vietnam. Tu (2016, pp. 616-627) highlighted the importance of 3PL model in logistics services in Vietnam but Tu could not identify key factors influencing on Logistics Service Quality and logistics performance in examined firms. By exploring the current situation in academic studies about Logistics Service Quality in Vietnam, it seems that most of previous researchers have relied on qualitative assessment. Therefore, the studies, while informative, cannot be easily generalized.

Third, this study is developed for Saigon New Port Logistics (SNPL) which is known as a logistics firm in the south of Vietnam. Currently, the firm has been facing with the slower bi-yearly growth rate in its capacity of container loading. According to SNPL (2018), total container loading volume of the firm in the period from 2010 to 2017 as below:

Table 1: Total container loading of SNPL (Twenty Foot Equivalent Unit)

Year	2010	2012	2014	2016
TEU	2,454,000	3,515,000	4,784,000	5,998,854
Bi-yearly growth %	-	43 %	36 %	25 %

Source: SNPL's report (2018, pp. 1)

Table above shows that total container loading of SNPL has decreased from 43 % in 2012 to 25 % in 2016. Total container loading of the firm in 2017 was 6,806,300 TEU. Current situation is a real concern for the board of management of the firm since growth rate has dramatically decreased and it effects the sales revenues and profits of the firm accordingly. It is emphasized that service quality is a major concern for the firm and empirical evidences show that lower service quality may lead to a lower sales revenue in logistics firms.

1.3 Aim of the study and research questions

The aim of this study is to identify key factors affecting Logistics Service Quality in the case study of SNPL. To support this research aim, the research question is:

- What are the key factors explaining Logistics Service Quality?

1.4 Research approach

According to Saunders et al. (2016, pp. 117), there are two research approaches, namely deductive and inductive. A deductive research approach is conducted when the researchers establish their studies upon on existing research models which are provided by previous researchers and the main objective of their studies is to verify hypotheses (Saunders et al., 2016, pp. 117). Inductive research approach is the opposite of

deductive approach and it refers to the process in which the researchers try to develop new theories from actual observations of a social phenomenon (Saunders et al., 2016, pp. 117). In this study, deductive research approach is chosen due to the researcher can find many empirical evidences about factors influencing on Logistics Service Quality. The researcher, moreover, is in the position of verifying existing theories in the context of a logistics firm in Vietnam rather than inventing new theories.

1.5 Expected results

When preparing this study, there are some expected results. The first expected result is that this study identifies which factors have the highest effect on Logistics Service Quality in the case study of SNPL. Therefore, the logistics managers in their firm can shape up their management decision to improve Logistics Service Quality of their firm. The second expected result is that this study investigates and confirms what the current issues are in logistics operations of SNPL. By identifying these issues, the logistics managers can understand the strengths and the weaknesses in their logistics processes.

1.6 Research scope

To obtain the research aim and the research objectives, this study will be conducted within specific scopes. At first, this study is conducted as a case study within SNPL. Second, this study is about Logistics Service Quality and it is relied on quantitative measurement to identify the effect of factors on Logistics Service Quality at SNPL. Finally, this study comes up with a survey of questionnaire with the participation of customers of SNPL. Therefore, all the key findings which are extracted from the survey of questionnaire, are valid at the time when the data is collected.

1.7 Research structure

This study is designed with five chapters:

Chapter 1 Introduction

In this chapter, the researcher provides some background information related to the performance of Vietnam's logistics industry. The reason of choosing this researched topic is highlighted and it is the basis for the formulation of the research aim and the research objectives. The research approach, the expected results and the scope of the study is presented in this chapter.

Chapter 2 Literature Review

In this chapter, the researcher provides theoretical basis about logistics and Logistics Service Quality. Then, a collection of previous empirical evidences will be presented as the basis for the development of a research model and the research hypotheses.

Chapter 3 Research Methodology

In this chapter, the researcher presents relevant research methodologies and presents arguments for selecting an appropriate research philosophy, research approach, research strategy, and research method. The researcher presents also the process of collecting primary and secondary data and how the collected data is processed and treated.

Chapter 4 Data Analysis and Findings

In this chapter, the researcher conducts some quantitative data analysis techniques that allows to understand better the respondents' demographic characteristics and their agreement or their disagreement about each questionnaire's statement. The quantitative effect of each key factor on Logistics Service Quality of SNPL will be evaluated in detail and then the most significant factor will be highlighted.

Chapter 5 Conclusion and Recommendation

In this chapter, the researcher summarizes all the key findings which have been obtained from previous chapters. Then, the recommendations are proposed which help the logistics managers at SNPL to further improve their Logistics Service Quality.

2 LITERATURE REVIEW

2.1 The main concepts of the study

2.1.1 Definitions of logistics

The concept of logistics is provided by The Council of Supply Chain Management Professionals (CSCMP) and it is defined as a part of the supply chain which is established to plan, to implement and to control the flows of goods and services from originate point to consumption point in both efficient and effective ways (Stroh, 2002, pp. 1). In this context, understandings of logistics require respective knowledge about supply chain. According to Christopher (1998, pp. 2), supply chain is a business network that includes both upstream and downstream activities in order to transport raw materials to manufacturers and to deliver finished products to the customers. Supply Chain Management (SCM) is a common concept and it refers to a management framework which helps a company to achieve business goals and objectives (Langley et al., 2002, pp. 7). Effective SCM system also allows a company to reduce unnecessary time and to gain more customer satisfaction since the products and services are transferred smoothly from this company to its customers (Ayer, 2001, pp. 12-15).

As mentioned above, logistics is a part of supply chain system of a company. According to Caddy (1990, pp. 319-327), logistics system of a company is designed upon information technologies, organizational strategy structure, and individual factors. Information technologies are applied in order to increase the efficiency and the effectiveness of logistics activities (Helou and Caddy, 2006, pp. 77-83). Organizational strategy structure refers to the combination and the interaction of the components which are related to logistics activities such as information flows, product management, procurement, etc. (Helou and Caddy, 2006, pp. 77-83). Logistics activities also depends on individual factors such as employee satisfaction, employee capabilities and skills, the competition in the market, etc. (Helou and Caddy, 2006, pp. 77-83). Moreover, a set of criteria which helps a company to evaluate its logistics activities includes information quality, dependability efficiency, cost efficiency, and speed efficiency (Yourdon, 1989, pp. 78-94).

2.1.2 The role of logistics activities

The roles of logistics activities are discussed in this section. The first role of logistics activities is to ensure that the profitability of a company is achieved and maintained at proper level and this role is obtained throughout optimal combination between inputs and outputs (Begg et al., 1984, pp. 5). Moreover, if the logistics system is implemented effectively, it allows a company to reduce operating cost and therefore contributing to higher profitability level (Begg et al., 1984, pp. 5). The second role of logistics activities is to bring value to shareholders (Sinclair, 2002, pp. 1). Indeed, logistics is a system to connect all components into a valued business network and this network allows a company to reach business goals while their customers' demands are fulfilled simultaneously (Bovert and Frentzel, 1999, pp. 96-104). According to Sinclair (2002, pp. 1), this second role of logistics activities is more visible when a company has larger business scale. On the other hand, it means that the more business scale volume, the more value added by logistics activities to shareholders (Sinclair, 2002, pp. 1).

2.1.3 Logistics models

In this section, several logistics models are put into the discussion. According to Ogorelc (2007, pp. 371-380), logistics activities are organized through self-efficient logistics function (1PL), capacity provider (2PL), outsourced logistics services (3PL), integrated logistics services (4PL), and supply chain management (5PL). The first logistics model is 1PL and it is suitable for small businesses and when most of the activities are conducted by itself (Ogorelc, 2007, pp. 371-380). However, when business scale of a company is expanded to certain level, 1PL model is not suitable and the company needs to adopt higher functioning models like 2PL, 3PL, 4PL, and 5PL. The establishment of 2PL model is based on the business requirement of a company when it has markets in different locations of a country or multi-national business activities (Ogorelc, 2007, pp. 371-380). In such business situation, the company needs to utilize different transportation modes such as air freight and/or sea freight to transfers goods to different customers' locations. Empirical evidence from Lu and Su (2002, pp. 18) affirms that 2PL logistics model allows a company to maintain its international business scale. However, when business scale is further expanded, a company which wants to

continue expanding its business takes into account 3PL logistics model and this model refers to outsourced logistics activities.

According to Cheong (2004, pp. 2) 3PL model gains more attention from the companies today as in-house conduction of logistics activities requires excessive labor and capital. On the other hand, higher cost and complexity in human resource management are two key factors that lead to the choice of 3PL model (Lu and Su, 2002, pp. 19). It is notable that 3PL model has both advantages and disadvantages. According to Husdal (2011, pp. 1), the advantages of 3PL model refer to better utilization of physical asset and lower investment cost to a company while the disadvantage of this model refers to the conflict between the companies and their outsources. Bad communication between the companies and their outsourcing vendors for logistics activities is the top concern in most of the time (Cheong, 2004, pp. 2-3). Despite of this disadvantage, 3PL model is favorite to companies and they can gain benefits from higher effectiveness and efficiency of logistics activities because of outsources are very keen on new technologies (Husdal, 2011, pp. 1).

Over time, the 3PL model has evolved with the introduction of integrated logistics services or 4PL model. According to Ogorelc (2007, pp. 371-380), 4PL is 3PL model with the integration of information technologies. On the other hand, information technologies are adopted in 3PL model in order to connect logistics activities with other functions of a company such as financial management, human resource management, and outsources management (Zhang et al., 2006, pp. 646-655). The integration of information technologies also brings the value of reducing the conflict in the communication between the companies and outsources (Chanut and Pache, 2012, pp. 16-28). Empirical evidence from Saglietto (2013, pp. 104-116) indicates that 4PL is logistics model which allows a company to better evaluate the performance of outsources while it brings the information to optimize the utilization of warehousing and storage and it is extremely important in case of market changes.

The last model of logistics is 5PL or supply chain management model. This model is developed upon on the fact that logistics is part of SCM system of a company (Ogorelc, 2007, pp. 371-380). In addition, new information era is started with web-based technologies (Lavin, 2005, pp. 10-12). It is asserted that logistics activities are not

carried with the application of virtual network or there is electronic business to be established (Farahani et al., 2011, pp. 4). Electronic business is a virtual network where a company can meet potential vendors and therefore logistics activities are conducted in more efficient and effective ways (Farahani et al., 2011, pp. 4).

2.2 Defining the service quality in logistics

Even though logistics activities have been conducted for many decades, an old thought dominates literature reviews in which logistics is considered as cost generator rather than differentiation generator (Ballou, 2004, pp. 10). However, this old thought is replaced during the 1990s when the researchers perceive that the quality of logistics activities and related services can contribute to the generation of customer satisfaction and customer loyalty (Saura et al., 2008, pp. 651; Richey et al., 2007, pp. 195; Mentzer et al., 2004, pp. 4). It is notable that logistics is more towards a service-based activity (Chapman et al., 2003, pp. 30).

The understandings of Logistics Service Quality (LSQ) is perceived through two perspectives, including objective quality and subjective quality. At first, objective quality of logistics services is put into discussion. According to Crosby (1991, pp. 1), objective quality refers to how service providers provide the specifications to evaluate service quality. Under this perspective, it is required that specifications must be provided in a way that can be observed and measured (Garvin, 1984, pp. 26). The second perspective refers to subjective quality of services and it is developed upon the belief that service quality is judgment and attitude measurement process which is associated with the superior nature of the services (Parasuraman et al., 1998, pp. 15). In the shed of logistics services and these two perspectives above, Bienstock et al. (1997, pp. 31-44) provide an approach in which objective variables are determined and they are measured through subjective components generated from the gap between customer expectation and customer perception of a service. Recent empirical evidences also treat LSQ as the difference between perceived service quality and expected service quality from the customers (Mentzer et al., 2001, pp. 4; Sohal et al., 1999, pp. 267-280; Millen and Maggard, 1997, pp. 173-179).

In terms of how to measure LSQ, there are three different approaches. The first approach refers to technical quality whether a service is accepted technically and it brings concrete results (Gronroos, 1982, pp. 33). The second approach is functional quality and it is perceived as how the customer treatment is during the process of delivering the services (Gronroos, 1982, pp. 33). The last one is proposed by Rust and Oliver (1994, pp. 5-20) and it is named as service environment. Rust and Oliver (1994, pp. 5-20) proposes the utilization of SERVQUAL model that is provided by Parasuraman et al. (1988, pp. 23) in order to measure service quality. SERVQUAL model captures five elements of service quality, including reliability, reactivity, empathy, tangibility, and safety (Parasuraman et al., 1988, pp. 16). Each element is measured by the difference between expected service quality and perceived service quality. However, Cronin and Taylor (1994, pp. 130) provide a revision of SERVQUAL model and they replace the gap between expectation and perception with the result of measurement, leading to the introduction of SERVPERF model.

Regarding to Logistics Service Quality, there are two different models which are proposed by Bienstock et al. (1997, pp. 31-44) and Mentzer et al. (1999, pp. 4). The first model is developed upon the basis of physical distribution service quality and the second model, however, focuses on an integral logistics. The revision of Mentzer et al. (1999) leads to a new multidimensional model. This new model is widely accepted and utilized by different researchers over the time (Rafid and Jaafar, 2007, pp. 159-175; Richey et al., 2007, pp. 195-228; Stank et al., 2003, pp. 45-54).

2.3 Factors affecting the service quality in logistics

Given to the understandings of Logistics Service Quality (LSQ), this section is developed with the objective of determining factors affecting it. As mentioned in previous section, previous researchers focus on multidimensional evaluation of LSQ, leading to the proposal of different factors which help measure LSQ level such as quality of contact point, accuracy and condition of the orders, timeliness of logistics services, information quality, etc. There are four factors that are put into discussion, namely personnel quality, information quality, order quality, and timeliness. These factors are selected because they wholly represent the quality aspects of logistics

services, which was affirmed by Xu and Cao (2008, pp. 58), Yu et al. (2010, pp. 359) and Ho et al. (2012, pp. 113). Moreover, SNPL is providing logistics services to many companies in Vietnam and the services are performed upon the quality of the company's employees, information and order which are given to the customers. In addition, one of the key advantage for logistics companies is to deliver goods on time as promised and it is reflected through the timeliness level of logistics services. Therefore, the evaluation of these four factors allows the researcher to understand further about logistics service quality of SNPL.

2.3.1 Personnel quality

Xu and Cao (2008, pp. 58) assert that the interaction between the customers and the companies' staff affects customer satisfaction with Logistics Service Quality. Moreover, Lu et al. (2011, pp. 1071-1089) indicate some key indicators of high personnel quality, including the ability to distinguish regular customers, knowledge about products and services offered to the customers, the ability to learn customers' preferences, and the ability to provide attention to individual customer. In addition, poor personnel quality could lead to the result of which the customers switch to another logistics services provider (Lu et al., 2011, pp. 1071-1089).

2.3.2 Information quality

According to Yu et al. (2010, pp. 359), information quality has a prominent role in Logistics Service Quality. It is denoted that when the customers have more information, they can make better decisions, and it is also true to the companies since rich information allows them to make better operational decisions (Mentzer et al., 2001, pp. 4). Service performance of the companies can be improved further throughout better information provision, trustworthy information, and the information must be provided in different languages (Parasuraman, 2004, pp. 45-5).

2.3.3 Order quality

Order quality reflects average effectiveness and success of a logistics company (Xu and Cao, 2008). According to Parasuraman (2004, pp. 45-52), quality of an order is

maintained through the completion of provided services, accuracy information of billings, and records of orders are correct. Empirical evidences from Mentzer et al. (2001, pp. 85) and Saura et al. (2008, pp. 657) show that order quality is obtainable when goods are delivered to the customers without any damages. The measurement of order quality is also detected through how many customers' complaints with logistics services (Mentzer et al., 2001, pp. 85).

2.3.4 Timeliness

Timeliness plays a critical role in promoting the relationship between customers who use logistics services (Ho et al., 2012, pp. 113). According to Saura et al. (2008, pp. 657), timeliness is defined as an order is delivered on time. To increase the timeliness of logistics services, the companies need to reduce operational process in each logistics services stops (Choudhry and Khan, 2001, pp. 77-84). Empirical evidence from Mattila and Mount (2006, pp. 5) shows that timelines helps to when the companies can deliver logistics services with flexible timelines, customer satisfaction with logistics services is improved accordingly.

2.4 Proposed research model

It is denoted that the quality of a service is measured by five elements in SERVQUAL model, including reliability, reactivity, empathy, tangibility, and safety (Parasuraman et al., 1988, pp. 23). Although SERVQUAL model is useful to evaluate service quality, it receives some criticism from other researchers. The first criticism highlights that the questionnaire which is used in SERVQUAL model is too general and it may not be applicable for different services (Gulc, 2017, pp. 39). The second criticism is that SERVQUAL model is to measure the gap between customers' expectation and customers' perception of service quality but not all customers can express such difference (Gulc, 2017, pp. 39). In this context, SERVQUAL model should not be applied in this study, leading to the need of choosing more suitable model.

A literature review of studies related to Logistics Service Quality indicates that Logistics Service Quality can be measured by two approaches, including subjective quality and objective quality. Subjective quality of a logistics is developed by Crosby

(1979, pp. 1) and logistics quality refers to the specifications of logistics services which are provided by logistics providers. In this context, Logistics Service Quality is evaluated through the point of view of the providers. This approach, however, omits the evaluation from the customers and therefore the evaluation may not be true. The second approach is objective quality and it leads to the evaluation of physical operations of logistics services (Mentzer et al., 1999, pp. 31-44). This model consists of timeliness and condition but does not consists of the evaluation to people who deliver logistics services.

In this context, the research proposes a new research model with the combination between physical operational of logistics services and SERVQUAL model. This model includes timeliness, information quality and order quality as dimensions in physical operation model (Xu and Cao, 2008, pp. 58; Yu et al., 2010, pp. 359; Ho et al., 2012, pp. 113) and it includes personal factor which is highlighted in SERVQUAL model (Parasuraman et al., 1988, pp. 23). In this study, a research model is proposed:

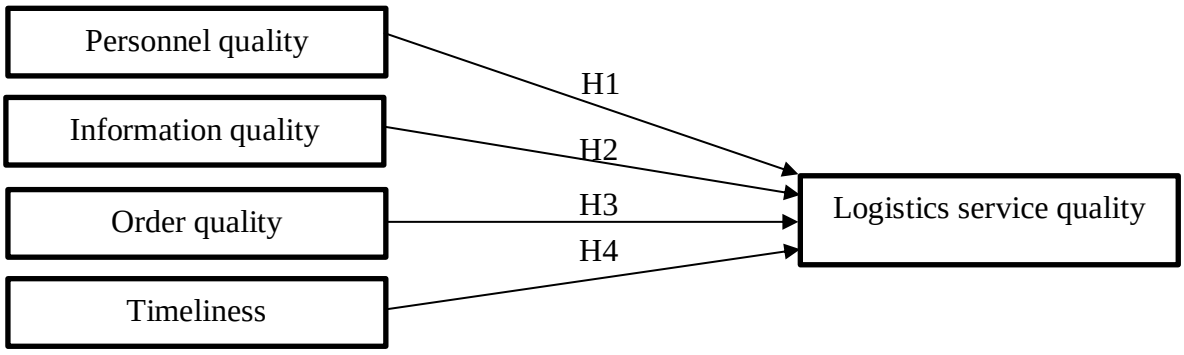

Figure 2: Proposed Research Model

Source: Prepared by the author (2018)

Then, research hypotheses are proposed as below:

H1: Personnel quality is positively associated with Logistics Service Quality.

H2: Information quality is positively associated with Logistics Service Quality.

H3: Order quality affects is positively associated with Logistics Service Quality.

H4: Timeliness affects is positively associated with Logistics Service Quality.

H5: Personnel quality, information quality, order quality, and timeliness altogether explain Logistics Service Quality and they each independently contribute to Logistics Service Quality.

3 RESEARCH METHODOLOGY

3.1 Research philosophy

According to Li (2015, pp. 73), research philosophy reflects the belief of the researchers to acquire academic understandings about particular social phenomenon throughout certain process. Saunders et al. (2016, pp. 102) highlight four most important research philosophies which are often being used in academic studies, namely positivism, realism, pragmatism, and interpretivism. Positivism research philosophy refers to the process of developing and acquiring the understandings about social phenomenon through data analysis (Aliyu et al., 2015, pp. 2). Realism is chosen when target social phenomenon has value laden characteristics (Brierley, 2017, pp. 13). Pragmatism is defined as a process in which the researchers involve both subjective and objective assessment into their researches (Brierley, 2017, pp. 15). Interpretivism is perceived as the way of which the researchers and social phenomenon are integrate together and therefore the argument and the assessment of the researchers can be used to understand about social phenomenon (Kivunja and Kuyini, 2017, pp. 33).

In this study, positivism research philosophy is chosen due to some reasons. The first reason is that positivism research philosophy brings the values with less biases compared to other research philosophies (Saunders et al., 2016, pp. 103). The second reason of choosing positivism research philosophy refers to the fact of the studies which aims to investigate causal relationship among variables are better resolved when positivism research philosophy is adopted (Saunders et al., 2016, pp. 103). As highlighted in Chapter 2, the researcher aims to quantify causal linkages between Logistics Service Quality and four determinants, including personnel quality, information quality, order quality, and timeliness.

3.2 Research approach

Research approach is defined as a process which is obtained and implemented by the researchers in order to achieve research objectives (Saunders et al., 2016, pp. 117). There are two different research approaches, namely deductive and inductive. Deductive approach refers to the process in which the researchers collect related theories about target social phenomenon and they apply existing conceptual research models which are provided by previous researchers into their studies (Walliman, 2017, pp. 19). By applying deductive approach, the researchers want to validate existing theories (Saunders et al., 2016, pp. 117).). Inductive approach is applied when the researchers do not want to validate existing theories but they aim to create new theories related to social phenomenon (Walliman, 2017, pp. 17).

In this study, the deductive approach is chosen due to some reasons. The first reason is sourced from the nature of the studied topics. According to Saunders et al. (2016, pp. 120), deductive approach is suitable in the studies with common researched topics. This study is about Logistics Service Quality and it is a very common topic and the researcher can rely on many existing empirical evidences or conceptual research models which are provided by previous researchers. In this context, this study is not developed to identify new theories related to Logistics Service Quality but to validate whether a model of Logistics Service Quality is true in the case of a logistics company in Vietnam. The second reason is that the choice of research approach is influenced by the choice of research philosophy (Saunders et al., 2016, pp. 117). It is notable that positivism research philosophy and the deductive approach is paired well with each other.

3.3 Research strategy

According to Collins (2010, pp. 62), research strategy has many forms, including case study, archival research, ethnography, grounded theory, etc. Since there are many types of research strategy, the need to choose the best research strategy is not easy and it is dependent on the researchers' capabilities to perform their research (Saunders et al., 2016, pp. 135). In this study, a case study is chosen due to a number of reasons. The first reason is that the research strategy is selected according to the research objectives of the studies (Saunders et al., 2016, pp. 135). In Chapter 1, the researcher proposes

several research objectives and they are emphasized particularly in SNPL; thus, case study of SNPL is required accordingly. The second reason refers to the appropriateness of case study when positivism research philosophy and deductive approach are both selected (Schiffman and Kanuk, 1997, pp. 238). Finally, a case study allows the researcher to collect additional information about the organization where target social phenomenon is integrated with.

3.4 Research method

There are two research methods which are adopted by many researchers in academic sciences, including qualitative method and quantitative method (Saunders et al., 2016, pp. 146). These research methods have unique characteristics when comparing with each other. According to Dawson (2009, pp. 14), a quantitative method refers to the way of analyzing numerical data with the adoption of well-structured interview or survey. Berg and Latin (2004, pp. 246) assert that a quantitative method is certain choice when the studies aim to investigate and quantify causal relationship among variables. McCarthy (2008, pp. 21) claims that the value of quantitative method is the suitability for researchers who want to verify research hypotheses or predict the future trends of social phenomena. Another value of a quantitative method refers to the fact that it reduces personal interferences from the researchers during the analysis process (Nykiel, 2007, pp. 39).

A qualitative method, however, is useful when the studies are explored by using an unstructured interview-based method (Saunders et al., 2016, pp. 145). Mack et al. (2005, pp. 2) indicate that a qualitative method is suitable for studies in which the researchers collect opinions from a focus group. Unlike a quantitative method, a qualitative method is largely dependent on personal assessments and therefore obtained results may not be biased by personal opinions of the researchers (Nykiel, 2007, pp. 39). Kerlinger (1996, pp. 279) indicates that a qualitative method can be used to identify causal relationship among variables but this researcher criticizes that there is a change of manipulating independent and dependent variables that lead to wrong assessment.

After understanding the differences between a quantitative and a qualitative method, the researcher decision towards which research method to be applied is a quantitative

method. The application of a quantitative method leads to the decision of data collection and a questionnaire development which are presented in the next sections of this chapter.

3.5 Data collection

Data collection is an important process in any academic studies, according to Saunders et al. (2016, pp. 247). There are two different data which are being collected by the researchers in academic sciences, namely primary data and secondary data (Saunders et al., 2016, pp. 247). Primary data and secondary data have different characteristics.

Primary data is obtained when the researchers develop their owned process of collecting the data (Saunders et al., 2016, pp. 282). On the other hand, primary data refers to the information which is not existed as before and it is collected and utilized for the first time. The advantage of using primary data is that it provides direct supports to the researchers' studies. However, the cost of time and effort should be put into consideration in order to ensure that the quality of collected data can compensate well for. In this study, primary data is collected from a survey process. This survey requires the researcher to design and develop a questionnaire and then to distribute the questionnaire to certain people.

In addition to the collection of primary data, this study also utilizes secondary data which is defined as the information collected and published by other researchers (Saunders et al., 2016, pp. 247). The most benefit of using secondary data is that it does not require much time and effort to the researchers and the information is mostly free (Ajayi, 2017, pp. 2). However, since secondary data is collected by other researchers, the utilization of this data must be in careful manner in order to ensure that this data is not affected by different objectives.

3.6 Questionnaire development

In this study, a questionnaire is developed accordingly. The structure of the questionnaire is that each factor is constructed by different items. It is notable that there are five factors which are mentioned in the research model, including Logistics Service

Quality, personnel quality, information quality, order quality, and timeliness. Moreover, each factor consists of several items and these items are taken from the studies of previous researchers. Logistics Service Quality has three items and they are sourced from Choi (2008, pp. 277-289). Personnel quality is constructed from three items in which they are taken in different studies of Saura et al. (2007, pp. 650-668), Vinh (2013, pp. 1), and Kahnali and Esmaeili (2015, pp. 289-309). Each of information quality factor and order quality factor has three items and they are taken from the studies of Saura et al. (2008, pp. 650-668) and Vinh (2013, pp. 1). Finally, three items which are represented for timeliness are taken from the study of Kahnali and Esmaeili (2015). Each factor is constructed by different items and these items are highlighted in the table below:

Table 2: Questionnaire's items

Factor	Item	Source
Logistics Service Quality	I am satisfied with the overall logistics service level	Choi (2018)
	I am willing to recommend it to others	Choi (2018)
	I intend to continue to repurchase	Choi (2018)
Personnel quality	The product knowledge/experience of the company's personnel is adequate	Saura et al. (2007)
	Staff's attitude and behavior in meeting customers' satisfaction	Vinh (2013)
	The staff appears neat	Kahnali and Esmaeili (2015)
Information quality	The information about the order is available and appropriate for its purpose	Saura et al. (2007)
	Shipment tracing capability	Vinh (2013)
	Availability of order information	Vinh (2013)
Order quality	Ordering process is accuracy	Vinh (2018)
	The orders are free of damage, fault or loss	Vinh (2018)
	Ordering procedures are effective and easy to use	Saura et al. (2008)
	Products ordered from the firm meet technical requirements	Saura et al. (2008)
Timeliness	The company has adequate customer response time	Kahnali and Esmaeili (2015)
	Time between placing requisition and receiving delivery is short	Kahnali and Esmaeili (2015)
	Timelines according to what the company promises are met	Kahnali and Esmaeili (2015)

Source: Choi (2018), Vinh (2018), Kahnali and Esmaeili (2015), Vinh (2013), Saura et al. (2008)

In order to evaluate these items, the researcher employs a Likert scale of 5 points. The lowest point of Likert scale is 1 and it is represented for strongly disagreed attitude of the respondents. In the contrast, the highest point of Likert scale is 5 and it is represented for strongly agreed attitude of the respondents.

3.7 Data collection process

After the questionnaire was developed, it was sent to respective respondents to collect necessary data for the study. To collect the data, questionnaire was sent by email to the employees who are working for the companies. These companies are utilizing logistics services provided by Saigon New Port Logistics. The email includes the invitation section in which it clearly stated the reason of collecting data and how the information is kept in privacy. Since the researcher has friends who are working in customer service department, all information related to the companies which are using logistics services of SNPL are obtainable. The questionnaire was answered by the respondents and then they sent back the answers by email.

3.8 Sampling

The sampling section highlights the importance of choosing a sampling technique and sample size (Saunders et al., 2016, pp. 204). The sampling technique includes probability sampling and non-probability sampling (Saunders et al., 2016, pp. 207). The samples are selected by using probability sampling which is perceived as each member of the population gains equal probability of selection (Alvi, 2016, pp. 12). In contrast, non-probability sampling refers to the process in which each member in the population is selected judgmentally (Alvi, 2016, pp. 13). Choosing a random sampling technique has some advantages. The first advantage is that the sample size which is generated from the fact that random sampling allows the researchers to obtain understandings about the population and these understandings are not influenced by any particular groups. Moreover, probability sampling faces up less biases compared to non-probability sampling (Cohen et al., 2007, pp. 110).

After choosing the sampling technique, the next step is to determine the sample size for this study. Saunders et al. (2016, pp. 206) highlights appropriate sample size increases the value of the researches. It is notable that different researchers provide different appropriate level of sample size. Norusis (2005, pp. 10) recommends that a sample size of more than 300 respondents is appropriate while Hair et al. (2017, pp. 163-177) only requires a minimum of 150 respondents as appropriate sample size. In addition, there is other researchers like Gorsuch (1983, pp. 12), Kline (1979, pp. 22), and Hatcher (1994, pp. 37) who provide the rule of 100 or the minimum sample size is from 100 respondents. Considering all circumstances, the researcher chooses 100 as the sample size in this study. Such sample size is appropriate to the researcher since it does not take so much time to collect and process the data.

The questionnaire was distributed to the respondents by email and the researcher prepared the invitation statement. The questionnaire was embedded in the email's body along with the notice that the respondents need to return their answers after two weeks, in order to fulfil the sample size of 100 respondents. In case of the questionnaire distributed by email, the researcher sent 200 invitation letters to the customers of SNPL given to the email list provided by the customer service department of the company. Higher number of invitation letter allowed the researcher to collect right number of questionnaire. As a result, 120 questionnaires were collected but 20 of them were not qualified as they did not finish all questions or sent late. It means that a total of 100 successful questionnaires were collected from data collection process.

3.9 Data analysis techniques

There are four data analysis techniques that are applied in this study, including descriptive statistics, reliability test, exploratory factor analysis, and multiple linear regression. Each data analysis technique is utilized for specific data analysis purpose.

Descriptive statistics include frequency analysis and the researcher utilizes a frequency analysis to understand the demographic characteristics of the respondents. Descriptive statistics also include the calculation of mean value and standard deviation value of each item in the questionnaire. Mean value is useful in case of the researcher want to evaluate

the general attitude of the respondents towards a specific item while standard deviation allows to recognize the variation of the respondents' attitudes.

A reliability test was applied with the objective of understanding internal consistency of the scale (Wong et al., 2012, pp. 214). To detect that, Cronbach's alpha is calculated and the value of this alpha reveals overall reliability level of the scale. According to Inal et al. (2016, pp. 2), the lower value of Cronbach's alpha, the lower reliability level and accepted value of Cronbach's alpha is from 0.6 (Jain and Angural, 2017, pp. 285-291). It is notable that a reliability test is conducted at factor level and it requires that each item of examined factor must have a correlation with each other. According to Metintas et al. (2017, pp. 34-40), the correlation between items is denominated through a corrected item-total correlation index and a minimum value of this index is from 0.3. Another requirement in a reliability test is highlighted when one item is deleted. According to Arifin (2017, pp. 16), when one item is removed or deleted, new Cronbach's alpha must have a lower value.

The Exploratory Factor Analysis (EFA) is a multivariate statistical analysis and it helps the researcher to validate the research model and reduce the observed items into smaller number of components (Watkins, 2018, pp. 219). Before applying EFA, it is recommended that the researchers need to check the appropriateness of EFA with the dataset and it can be done through Kaiser–Meyer–Olkin (KMO) and Bartlett's Test of Sphericity (Chan and Idris, 2017, pp. 403). The minimum value of KMO is 0.50 while Bartlett's Test must be statistically significant (Chan and Idris, 2017, pp. 403). The output of EFA refers to the group of items into single component and the number of effective component is decided upon how many of them having initial eigenvalues higher than 1.0 (Rohit et al., 2017, pp. 2). In addition, one more requirement in EFA is that the cumulative of variance explained by chosen components must be higher than 50 % (Nguyen and Nguyen, 2017, pp. 699-708).

The last data analysis technique is a multiple linear regression and it is adopted to quantify the effects of personnel quality, information quality, ordering quality, and timeliness on Logistics Service Quality of SNPL. The overall effect of independent variables to dependent variable is explained through the Adjusted R-Square and the higher value of this index means the higher level of variance of Logistics Service

Quality explained by these independents. Each independent variable affects the dependent variable and the effect is quantified through a coefficient. It is notable that this coefficient is calculated from estimation process and T-Test is applied in order to ensure that this coefficient is not likely to have zero value.

4 DATA ANALYSIS AND FINDINGS

4.1 Description of the sample

This section is developed to explore demographic characteristics of the 100 respondents who participated in the survey. Since the customers of SNPL are enterprises, their demographic characteristics are reflected through location of the headquarters, number of years since they are established, the net profit margin, and the logistics cost as percentage of the total operating cost.

Table 3: Description of the sample

Characteristics	Category	Frequency	(%)
Location of headquarter of the respondents (n = 100)	Hanoi	45	45.0
	HCMC	33	33.0
	Others	22	22.0
Number of operating years since it is established (n = 100)	Less than 3 years	43	43
	3-5 years	32	32
	5-10 years	25	25
	More than 10 years	0	0
Net profit margin (n = 100)	Less than 5%	22	22
	5-10%	26	26
	10-15%	27	27
	More than 15%	25	25
Logistics cost as percentage of total operating cost (n = 100)	Less than 10%	21	21
	10-20%	30	30
	20-30%	19	19
	More than 30%	30	30

Source: Prepared by the researcher (2018)

There are 43 respondents who come from companies with location of headquarter in Hanoi, 33 respondents who come from companies with location of headquarter in HCMC, and 22 respondents who come from companies with location of headquarter in other cities and provinces. The percentage of the respondents of Hanoi, HCMC, and other cities and provinces are 45.0 %, 33.0 %, and 22.0 % respectively.

It is illustrated that there are 43 respondents who are working for the companies with number of operating years less than three years, 32 respondents who are working for the companies with number of operating years from 3 to 5 years, and 32 respondents who are working for the companies with number of operating years between 5-10 years, and no respondents who are working for the companies with number of operating years more than 10 years.

The next demographic information refers to the information of net profit margin (%) of the companies the respondents are working for. Obtained result shows that the distribution among the group of less than 5 %, 5-10 %, 10-15 %, and more than 15 % is quite equal with each other. There are 22 respondents who are working for the companies with net profit margin less than 5 %, 26 respondents who are working for the companies with net profit margin of 5-10 %, 27 respondents who are working for the companies with net profit margin of 10-15 %, and 25 respondents who are working for companies with net profit margin more than 15 %.

The logistics cost is measured by the percentage of total operating cost and it stands for logistics intensity of the companies. There are 21 respondents who are working for the companies with logistics cost less than 10 % of total operating cost. There are 30 respondents who are working for companies with logistics cost of 10-20 % of the total operating cost. There are 19 respondents who are working for the companies with logistics cost of 20-30 % of the total operating cost. There are 30 respondents who are working for the companies with logistics cost more than 30 % of the total operating cost.

4.2 Preliminary analysis

4.2.1 Reliability test analysis

Reliability test is conducted to check the scale item is replicated or not. It is a statistical data analysis which provides three statistical indexes, including Cronbach's alpha, corrected item-total correlation, and Cronbach's alpha if item deleted. Moreover, reliability test analysis is applied for each factor used in research model. Obtained result is presented in the tables below:

Table 4: Reliability test for Logistics Service Quality factor

Items	Content	Cronbach's alpha
LSQ1	I am satisfied with the overall logistics service level	0.70
LSQ2	I am willing to recommend it to others	
LSQ3	I intend to continue to repurchase	
PQ1	The product knowledge/experience of the company's personnel is adequate	0.78
PQ2	Staff's attitude and behavior in meeting customers' satisfaction	
PQ3	The staffs appear neat	
IQ1	The information about the order is available and appropriate for its purpose	0.74
IQ2	Shipment tracing capability	
IQ3	Availability of order information	
OQ1	Ordering process is accuracy	0.82
OQ2	The orders are free of damage, fault or loss	
OQ3	Ordering procedures are effective and easy to use	
OQ4	Products ordered from the firm meet technical requirements	
TI1	The company has adequate customer response time	0.76
TI2	Time between placing requisition and receiving delivery is short	
TI3	Timelines according to what the company promises are met	

Source: Prepared by the researcher (2018)

Cronbach's alpha of Logistics Service Quality factor is 0.708 which is illustrated for acceptable reliability level. Moreover, LSQ1, LSQ2, and LSQ3 have corrected item-total correlation values more than the minimum requirement which is noted at 0.30.

Finally, new Cronbach's alpha of the factor after LSQ1, LSQ2, and LSQ3 are 0.707, 0.584, and 0.528 and they are less than 0.708.

Cronbach's alpha of personnel quality is 0.782 which is illustrated for acceptable reliability level. Moreover, PQ1, PQ2, and PQ3 have corrected item-total correlation values more than the minimum requirement which is noted at 0.30. Finally, new Cronbach's alpha of the factor after PQ1, PQ2, and PQ3 0.735, 0.734, and 0.658 and they are less than 0.782.

Cronbach's alpha of personnel quality is 0.736 which is illustrated for acceptable reliability level. Moreover, IQ1, IQ2, and IQ3 have corrected item-total correlation values more than the minimum requirement which is noted at 0.30. Finally, new Cronbach's alpha of the factor after IQ1, IQ2, and IQ3 are 0.647, 0.595, and 0.689 and they are less than 0.736.

Cronbach's alpha of order quality is 0.819 which is illustrated for good reliability level. Moreover, OQ1, OQ2, OQ3, and OQ4 have corrected item-total correlation values more than the minimum requirement which is noted at 0.30. Finally, new Cronbach's alpha of the factor after OQ1, OQ2, OQ3, and OQ4 are 0.777, 0.764, 0.771, and 0.781 and they are less than 0.819.

Cronbach's alpha of timeliness is 0.759 which is illustrated for acceptable reliability level. Moreover, TI1, TI2, and TI3 have corrected item-total correlation values more than the minimum requirement which is noted at 0.30. Finally, new Cronbach's alpha of the factor after TI1, TI2, and TI3 are 0.636, 0.630, and 0.749 and they are less than 0.759.

All composite measures of LSQ are internally consistent (a > .70, Spiliotopoulou, 2009, pp. 6).

4.2.2 Exploratory factor analysis

EFA is applied for the independent variables, including all items of personnel quality, information quality, order quality, and timeliness. The method which is used in EFA analysis is Principal Component. The application of EFA is checked through KMO and Bartlett's test. The obtained result shows that KMO value is 0.665 and Bartlett's test is

statistical significant at 5 % of confidence interval. Therefore, EFA can be applied well for the dataset with all items of personnel quality, information quality, order quality, and timeliness.

There are 4 components which are extracted from the dataset. The first component has initial eigenvalue of 2.72 and % of variance value of 20.92 %. The second component initial eigenvalue of 2.29 and % of variance value of 17.66 %. The third component has initial eigenvalue of 2.23 and % of variance value of 17.13 %. The fourth component has initial eigenvalue of 1.75 and % of variance value of 13.49 %. Other components have initial eigenvalues less than 1.0 and they are not selected. Then, rotated component matrix table is generated by using Varimax as rotation technique. Then, there are 5 components to be generated. The name of Component 1, Component 2, Component 3, and Component 4 are order quality, personnel quality, timeliness, and information quality.

4.3 The main analysis

Pearson correlation coefficients is generated as below:

Table 5: Pearson correlation coefficients

Variable	Mean	SD	PQ	IQ	OQ	TI	LSQ
Personnel quality	2.60	0.60		0.03	-0.01	-0.05	0.24*
Information quality	2.55	0.71			-0.10	0.12	0.43**
Order quality	2.88	0.65				0.01	0.36**
Timeliness	2.51	0.68					0.46**
Logistics Service Quality	2.71	0.44					
Note: PQ = personnel quality; IQ = information quality; OQ = order quality; TI = timeliness; LSQ = Logistics Service Quality; **. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed)							

Source: Prepared by the researcher (2018)

The table above shows that Logistic Service Quality and personnel quality correlate, albeit weakly ($r = 0.240$; $p < 0.05$). Moderate correlation coefficients are found for the relationship between information quality and Logistics Service Quality ($r = 0.43$; $p < 0.001$), between order quality and Logistics Service Quality ($r = 0.36$; $p < 0.001$), and

between timeliness and Logistics Service Quality (r = 0.46; p < 0.001). Hence, hypotheses 1 – 4 are supported.

Linear regression and it is conducted with the dependent variable is Logistics Service Quality and independent variables are personnel quality, information quality, order quality, and timeliness. Obtained result is presented as below:

Table 6: Linear regression model explaining Logistics Service Quality (R^2 = 56.2%)

Variable	Beta	P-value
Personnel quality	0.25	<0.001
Information quality	0.42	<0.001
Order quality	0.41	<0.001
Timeliness	0.42	<0.001

Source: Prepared by the researcher (2018)

Table above shows that independent variables explain 56.2 % of the variance of Logistics Service Quality at SNPL. F-Test is statistical significant at 95 % of confidence level. Beta values of personnel quality, information quality, order quality, and timeliness are estimated at 0.25, 0.42, 0.41, and 0.42. Moreover, p-values of independent variables are less than 0.001. Given to the findings related to linear regression analysis, H5 is supported.

Table 7: Quality test

Test	Overall	Personnel quality	Information quality	Order quality	Timeliness
Durbin Watson	1.23				
VIF		1.01	1.00	1.02	1.03
Shapiro-Wilk test	0.93 (P<0.001)				

Source: Prepared by the researcher (2018)

The researcher also tests whether dependent variable is normally distributed. For dataset less than 2000 elements, the Shapiro-Wilk test is used, otherwise, the Kolmogorov-Smirnov test is used. In this study, there are only 100 respondents, the Shapiro-Wilk test is used. From the output of Shapiro-Wilk test, the p-value is less than 0.001. It is concluded that the dependent variable does not come from a normal distribution.

In statistics, the Durbin–Watson (DW) statistic is a test statistic used to detect the presence of autocorrelation at lag 1 in the residuals. DW is calculated at 1.231 and there is no autocorrelation issue in the dataset.

Moreover, the variance inflation factor (VIF) is the ratio of variance in a model with multiple terms, divided by the variance of a model with one term alone. It quantifies the severity of multicollinearity in an ordinary least squares regression analysis. VIF values for personnel quality, information quality, order quality, and timeliness are calculated at 1.01, 1.00, 1.02, and 1.03. They are all less than 5.0 so that there is no multicollinearity.

5 DISCUSSION

5.1 Discussion

This study is developed with the main objective of identifying key factors affecting Logistics Service Quality in the case study of SNPL, given the dramatic decreases in its growth rate over the past few years. Throughout this study, this research objective is fulfilled successfully. A quantitative research method is applied and primary data is collected through the survey with 100 respondents working for the companies who are using logistics services provided by SNPL. Demographic characteristics of 100 respondents are explored through frequency analysis. The measures used are internally consistent, also confirmed through EFA analysis. It is denoted that a research model is formulated in which Logistics Service Quality of SNPL is directly depended on personnel quality, information quality, order quality, and timeliness.

Moreover, the research question proposed in Chapter 1 was answered. The research model developed by the suggesting that Logistics Service Quality is influenced by four factors namely personnel quality, information quality, order quality, and timeliness, was supported by the analysis. The model explains 56.2 % of the variance of LSQ. All these factors are critical in the business of SNPL and the examination of each factor allows the researcher to understand more about Logistics Service Quality provided by the company. The main research question is to determine the key factors affecting Logistics Service Quality at SNPL. Linear regression as main data analysis technique and it helps to answer this research question. The result shows that there was no difference between information quality, order quality and timeliness. In addition, personnel quality seems to be slightly less important. Each, however, independently contributed to explain LSQ.

The obtained result is both similar and different to other studies. Muhammad and Yusoff (2016, pp. 275-286) analyze Logistics Service Quality of courier providers among students and they involve timeliness, accuracy of order, information quality, and personnel quality and availability to explain the level of Logistics Service Quality which is measured by customer satisfaction. This study is different from Muhammad and Yusoff (2016, pp. 275-286) in the context of this study measures logistics quality directly while Muhammad and Yusoff measures Logistics Service Quality through customer satisfaction. Moreover, this study identifies that timeliness and personnel quality and availability are correlated negatively to customer satisfaction towards Logistics Service Quality.

Although 56.2 % of the variances in Logistics Service Quality is explained by personnel quality, information quality, order quality, and timeliness, 43.8 % remains unexplained. In other words, there are other factors that are not identified yet. The primary data which is collected from the survey is in a well-structured format and it supports the quantitative measurement. However, there is still a concern that the respondents do not provide correct answers which are closed to their actual thinking. Moreover, only 120 responses were collected after sending 200 questionnaires to the respondents. The response rate is only 60% and it is quite low. The possible reasons could be that the respondents are not interested in the survey or they do not have sufficient knowledge about the topic, etc. Future research, therefore, should address these problems by determining more factors affecting Logistics Service Quality as well as establishing in-depth interviews with experts in order to identify other underlying issues in logistics services.

5.2 Conclusion

In this section, the researcher would like to summarize the answer to the research question proposed in Chapter 1. The main research question is to determine the key factors affecting Logistics Service Quality at SNPL. To answer this research question, the researcher collected empirical evidences about the factors affecting Logistics Service Quality. The outcome of this collection and examination is four factors, including personnel quality, information quality, order quality, and timeliness. Then, the

researcher prefers using quantitative research method and the data was collected from a well-structured questionnaire which was given to 200 respondents who are working in the companies with logistics activities through SNPL. The relationships between four factors and Logistics Service Quality are linear or a linear regression is utilized to quantify the effect of each factor. Obtained result shows that all factors explain for 56.2 % of variance of Logistics Service Quality of SNPL. From linear regression result, B values of personnel quality, information quality, order quality, and timeliness are estimated at 0.25, 0.42, 0.41, and 0.42. It is observed that information quality and timeliness share the same B value, which is almost the same compared to order quality and slightly higher compared to personnel quality.

The researcher also identified the issues in logistics operation of the company. These issues are recognized through descriptive statistics with mean value of each item calculated. The key issues are:

- In terms of personnel quality, SNPL's employees do not have good knowledge and experiences. Plus, their appearance is not neat.
- In terms of information quality, SNPL is facing with two issues, including that the order information is not available and appropriate for its purpose as well as that the order information is not always available.
- In terms of order quality, the customers' issues are that the orders are not free of damage, loss, and fault. Furthermore, the ordering procedure is not effective and easy to use.
- In terms of timeliness, SNPL cannot ensure short time between placing requisition and receiving delivery. Moreover, the timelines according to what the company promises are not met.

5.3 Recommendation

Based on the findings from the data analysis, there are four recommendations to be proposed.

The first recommendation refers to timeliness. It can be noticed from the linear regression result that timeliness has quite a significant effect on Logistics Service Quality of SNPL. There are two areas of timeliness in which SNPL should further

improve. The first area is the time between placing requisition and receiving delivery. The company must set standard time for this job and it should be set at shortest time in order to increase customer satisfaction. The second area is the company's promises towards timeliness and the company should provide the promises in line with the timeliness standards.

The second recommendation refers to another important factor, which is information quality. There are some areas in which information quality of SNPL can be further enhanced. SNPL is facing with two issues, including the order information is not available and appropriate for its purpose and order information is not always available. Therefore, it is recommended that the company should review its website's functions and then integrate more functional values to the website. The website should be designed with clear statement of order information and the status of shipping is updated to the customers.

The third recommendation is given to order quality, which is equally as important as the two mentioned above. There are two issues in order quality of SNPL, including when customers are faced with the damage and loss of order and order information is not always available. The company should revise the policy to protect the customers from order damages or loss. For example, the company can sign the contract in non-life insurance companies in Vietnam in order to compensate for order damage and loss. Order information should be sent by email to the customers and it must be updated on real time basis.

The fourth recommendation is developed to further improve personnel quality of SNPL. Currently, the respondents evaluate that the company's employees do not have good knowledge and experiences and their appearance is not neat. Therefore, the company should provide adequate trainings to the employees in order to improve their knowledge about logistics products and services. Moreover, the company should review recruitment policies in which the company needs to recruit talent candidates in the labor market. Other policies should be developed to retain talent employees staying and working for the company. These policies are job enlargement and job enrichment to develop the employees' career.

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APPENDIX I: SURVEY OF QUESTIONNAIRE

I am a student of an university and I am on the process of making graduation thesis with the topic "The factors affecting Logistics Service Quality. Case study at Saigon New Port Logistics (SNPL), Vietnam". Therefore, I would like to get your opinion about logistics service quality aspects of the company to complete my thesis. I hope to receive your enthusiastic support. Thank you.

Part I: Demographic infirmation

Location of the headquarter

- ☐ Hanoi
- ☐ Ho Chi Minh
- ☐ Others

Number of operating years

- ☐ Less than 3 years
- ☐ 3-5 years
- ☐ More than 5 years

Net profit margin

- ☐ Less than 5 %
- ☐ 5-10 %
- ☐ 10-15 %
- ☐ More than 15 %

Logistics cost as percentage of total operating cost

- ☐ Less than 10 %
- ☐ 10-20 %
- ☐ 20-30 %
- ☐ More than 30 %

Part II: Evaluation

Please provide your choice for each item below using the following scale:

1-Strongly disagree; 2-Disagree 3-Neutral; 4-Agree; 5-Strongly agree

Factor	Code	Item	1	2	3	4	5

Logistics service quality	LSQ1	I am satisfied with the overall logistics service level					
	LSQ2	I am willing to recommend it to others					
	LSQ3	I intend to continue to repurchase					
Personnel quality	PQ1	The product knowledge/experience of the company's personnel is adequate					
	PQ2	Staff's attitude and behavior in meeting customers' satisfaction					
	PQ3	The staffs appear neat					
Information quality	IQ1	The information about the order is available and appropriate for its purpose					
	IQ2	Shipment tracing capability					
	IQ3	Availability of order information					
Order quality	OQ1	Ordering process is accuracy					
	OQ2	The orders are free of damage, fault or loss					
	OQ3	Ordering procedures are effective and easy to use					
	OQ4	Products ordered from the firm meet technical requirements					
Timeliness	TI1	The company has adequate customer response time					
	TI2	Time between placing requisition and receiving delivery is short					
	TI3	Timelines according to what the company promises are met					

APPENDIX II: OUTPUT OF DATA ANALYSIS

Frequencies

Statistics					
		Location of the headquarters	Number of operating years since it is established	Net profit margin	Logistics cost as percentage of total operating cost
N	Valid	100	100	100	100
	Missing	0	0	0	0

Frequency Table

Location of the head quarter					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hanoi	45	45.0	45.0	45.0
	HCMC	33	33.0	33.0	78.0
	Others	22	22.0	22.0	100.0
	Total	100	100.0	100.0	

Number of operating years since it is established					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 3 years	43	43.0	43.0	43.0
	3-5 years	32	32.0	32.0	75.0
	5-10 years	25	25.0	25.0	100.0
	Total	100	100.0	100.0	

Net profit margin				
	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Less than 5%	22	22.0	22.0	22.0
	5-10%	26	26.0	26.0	48.0
	10-15%	27	27.0	27.0	75.0
	More than 15%	25	25.0	25.0	100.0
	Total	100	100.0	100.0	

Logistics cost as percentage of total operating cost

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10%	21	21.0	21.0	21.0
	10-20%	30	30.0	30.0	51.0
	20-30%	19	19.0	19.0	70.0
	More than 30%	30	30.0	30.0	100.0
	Total	100	100.0	100.0	

```
DESCRIPTIVES VARIABLES=LSQ1 LSQ2 LSQ3 PQ1 PQ2 PQ3 IQ1 IQ2 IQ3 OQ1 OQ2
OQ3 OQ4 TI1 TI2 TI3
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
LSQ1	100	2	4	3.24	.474
LSQ2	100	2	4	2.27	.566
LSQ3	100	2	4	3.12	.537
PQ1	100	1	3	2.34	.685
PQ2	100	1	5	3.29	.880
PQ3	100	1	3	2.16	.564
IQ1	100	1	3	2.18	.770
IQ2	100	1	5	3.44	1.067
IQ3	100	1	3	2.04	.751
OQ1	100	1	5	3.32	.931
OQ2	100	1	3	2.40	.696
OQ3	100	1	3	2.28	.726
OQ4	100	1	5	3.53	.834

TI1	100	1	5	3.14	1.005
TI2	100	1	3	2.27	.694
TI3	100	1	3	2.13	.761
Valid N (listwise)	100				

```
RELIABILITY
  /VARIABLES=LSQ1 LSQ2 LSQ3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	100	100.0
	Excluded[a]	0	.0
	Total	100	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.703	3

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LSQ1	5.39	.927	.457	.687
LSQ2	6.36	.718	.554	.570
LSQ3	5.51	.757	.559	.561

```
RELIABILITY
  /VARIABLES=PQ1 PQ2 PQ3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	100	100.0
	Excluded[a]	0	.0
	Total	100	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.782	3

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PQ1	5.45	1.725	.592	.735
PQ2	4.50	1.242	.634	.734
PQ3	5.63	1.852	.710	.658

```
RELIABILITY
  /VARIABLES=IQ1 IQ2 IQ3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	100	100.0
	Excluded[a]	0	.0
	Total	100	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.736	3

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
IQ1	5.48	2.515	.573	.647
IQ2	4.22	1.648	.629	.595
IQ3	5.62	2.642	.534	.689

```
RELIABILITY
  /VARIABLES=OQ1 OQ2 OQ3 OQ4
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	100	100.0
	Excluded[a]	0	.0
	Total	100	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.819	4

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OQ1	8.21	3.541	.648	.777
OQ2	9.13	4.256	.674	.764
OQ3	9.25	4.210	.651	.771
OQ4	8.00	3.919	.624	.781

```
RELIABILITY
  /VARIABLES=TI1 TI2 TI3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	100	100.0

	Excluded[a]	0	.0
	Total	100	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.759	3

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TI1	4.40	1.556	.648	.636
TI2	5.27	2.320	.656	.630
TI3	5.41	2.386	.521	.749

```
FACTOR
  /VARIABLES PQ1 PQ2 PQ3 IQ1 IQ2 IQ3 OQ1 OQ2 OQ3 OQ4 TI1 TI2 TI3
  /MISSING LISTWISE
  /ANALYSIS PQ1 PQ2 PQ3 IQ1 IQ2 IQ3 OQ1 OQ2 OQ3 OQ4 TI1 TI2 TI3
  /PRINT INITIAL KMO EXTRACTION ROTATION
  /FORMAT SORT BLANK(.50)
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /CRITERIA ITERATE(25)
  /ROTATION VARIMAX
  /SAVE REG(ALL)
  /METHOD=CORRELATION.
```

Factor Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.665
Bartlett's Test of Sphericity	Approx. Chi-Square	431.569
	df	78
	Sig.	.000

Communalities

	Initial	Extraction
PQ1	1.000	.678
PQ2	1.000	.718
PQ3	1.000	.779
IQ1	1.000	.650
IQ2	1.000	.722
IQ3	1.000	.667
OQ1	1.000	.679
OQ2	1.000	.692
OQ3	1.000	.661
OQ4	1.000	.676
TI1	1.000	.734
TI2	1.000	.764
TI3	1.000	.576

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.720	20.924	20.924	2.720	20.924	20.924	2.641	20.315	20.315
2	2.295	17.658	38.582	2.295	17.658	38.582	2.221	17.082	37.397
3	2.227	17.130	55.711	2.227	17.130	55.711	2.106	16.202	53.599
4	1.754	13.490	69.201	1.754	13.490	69.201	2.028	15.603	69.201
5	.693	5.333	74.534						
6	.603	4.638	79.172						
7	.524	4.033	83.205						
8	.494	3.803	87.007						
9	.465	3.575	90.582						

10	.375	2.881	93.463						
11	.332	2.553	96.017						
12	.293	2.250	98.267						
13	.225	1.733	100.000						
Extraction Method: Principal Component Analysis.									

Component Matrix[a]				
	Component			
	1	2	3	4
OQ1	.791			
OQ2	.783			
OQ3	.760			
OQ4	.721			
TI1		.662		
TI2		.616		-.511
TI3		.570		
PQ1		-.564	.553	
PQ3			.720	
PQ2			.676	
IQ3				.672
IQ2				.534
IQ1				
Extraction Method: Principal Component Analysis.				
a. 4 components extracted.				

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
OQ2	.820			
OQ3	.810			
OQ1	.806			
OQ4	.800			
PQ3		.880		
PQ2		.842		
PQ1		.814		

TI2			.873	
TI1			.851	
TI3			.743	
IQ2				.834
IQ3				.808
IQ1				.784
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]				
a. Rotation converged in 5 iterations.				

Component Transformation Matrix				
Component	1	2	3	4
1	.930	-.030	-.135	-.341
2	.203	-.585	.717	.321
3	.249	.770	.346	.474
4	.179	-.252	-.590	.745
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				

```
FACTOR
  /VARIABLES LSQ1 LSQ2 LSQ3
  /MISSING LISTWISE
  /ANALYSIS LSQ1 LSQ2 LSQ3
  /PRINT INITIAL KMO EXTRACTION ROTATION
  /FORMAT SORT BLANK(.50)
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /CRITERIA ITERATE(25)
  /ROTATION VARIMAX
  /SAVE REG(ALL)
  /METHOD=CORRELATION.
```

Factor Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.659
Bartlett's Test of Sphericity	Approx. Chi-Square	53.909
	df	3
	Sig.	.000

Communalities		
	Initial	Extraction
LSQ1	1.000	.545
LSQ2	1.000	.667
LSQ3	1.000	.672
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.884	62.791	62.791	1.884	62.791	62.791
2	.640	21.335	84.125			
3	.476	15.875	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]	
	Component
	1
LSQ3	.819
LSQ2	.817
LSQ1	.738
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Rotated Component Matrix[a]
a. Only one component was extracted. The solution cannot be rotated.

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT LSQ
  /METHOD=ENTER PQ IQ OQ TI
  /RESIDUALS DURBIN.
```

Regression

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	TI, OQ, PQ, IQ[b]	.	Enter
a. Dependent Variable: LSQ			
b. All requested variables entered.			

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.761[a]	.579	.562	.29141	1.231
a. Predictors: (Constant), TI, OQ, PQ, IQ					
b. Dependent Variable: LSQ					

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.106	4	2.777	32.697	.000[b]
	Residual	8.067	95	.085		
	Total	19.173	99			
a. Dependent Variable: LSQ						
b. Predictors: (Constant), TI, OQ, PQ, IQ						

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.093	.240		.389	.698		
	PQ	.184	.049	.251	3.772	.000	.996	1.004
	IQ	.259	.042	.416	6.172	.000	.973	1.027
	OQ	.276	.046	.406	6.063	.000	.989	1.011
	TI	.270	.043	.418	6.228	.000	.982	1.018
a. Dependent Variable: LSQ								

Collinearity Diagnostics[a]								
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	PQ	IQ	OQ	TI
1	1	4.811	1.000	.00	.00	.00	.00	.00
	2	.068	8.403	.00	.10	.50	.19	.09
	3	.063	8.770	.00	.12	.24	.01	.66
	4	.047	10.106	.00	.47	.10	.42	.10
	5	.012	20.405	1.00	.30	.17	.38	.15
a. Dependent Variable: LSQ								

Residuals Statistics[a]					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.9767	3.3710	2.7067	.33494	100
Residual	-.70435	.87665	.00000	.28546	100
Std. Predicted Value	-2.180	1.984	.000	1.000	100
Std. Residual	-2.417	3.008	.000	.980	100
a. Dependent Variable: LSQ					

```
CORRELATIONS
  /VARIABLES=LSQ PQ IQ OQ TI
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

Correlations

Correlations						
		LSQ	PQ	IQ	OQ	TI
LSQ	Pearson Correlation	1	.240*	.433**	.363**	.458**
	Sig. (2-tailed)		.016	.000	.000	.000
	N	100	100	100	100	100
PQ	Pearson Correlation	.240*	1	.029	-.006	-.051
	Sig. (2-tailed)	.016		.777	.951	.614
	N	100	100	100	100	100
IQ	Pearson Correlation	.433**	.029	1	-.103	.122
	Sig. (2-tailed)	.000	.777		.308	.228
	N	100	100	100	100	100

OQ	Pearson Correlation	.363**	-.006	-.103	1	.005
	Sig. (2-tailed)	.000	.951	.308		.964
	N	100	100	100	100	100
TI	Pearson Correlation	.458**	-.051	.122	.005	1
	Sig. (2-tailed)	.000	.614	.228	.964	
	N	100	100	100	100	100
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						