

The Effect of Customer Service on Firm Performance: Developing Scales for Performance Measurement of Customs Clearance Firms

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Abstract

This research has three objectives: one is to develop measuring criteria for ascertaining performance of customs clearance firms, another is to test reliability and validity of the factors, and the third is to analyze the relationship between customer service and firm performance. This research gathered the data from customs clearance firms. Reliability and validity concerned with the collected data are tested by exploratory factor analysis and confirmatory factor analysis and the relationship between variables is tested by analyzing structural equation modeling. The results are as follows. There are no problems in reliability and validity. According to the result of the analysis, customer service is divided into customer focus, customer needs, customer response and flexibility and performance is classified into customer performance and financial performance. The result of empirical tests is as follows. Customer focus has a positive effect on customer performance and financial performance. Flexibility has a positive effect on both types of performance. This means that firms which have discriminative services and a high level of flexibility through collaboration with customers can achieve high levels of customer performance and financial performance.

Key Words: *Customs Clearance Firms, Scale Development, Customer Service, Firm Performance*

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1. Introduction

Performance is concerned with achieving goals. It can be defined as efficiency and effectiveness to accomplish goals. It can be divided into three dimensions which are corporate, business unit and functional levels. The first is associated with achieving goals in the whole strategy of a corporate level. The second means that it is related to business unit strategy. The third is connected with functional strategy. Measuring performance needs correct classification of the measuring factors at strategic, tactical and operational levels and it also needs a balanced approach to financial and non-financial measurement (Gunasekaran et al., 2001; Whitten et al., 2012). Financial measurement in performance is important to strategic decision-making, whereas non-financial measurement is important to daily and functional operations. Therefore, it is very significant to measure performance in non-financial as well as financial aspects.

Classificatory criteria on performance are necessary to access to an internal aspect of a firm to consider above factors. To see collaboration among firms, measuring performance in a firm appears not to reflect an aspect of the whole process. For this reason, measuring performance in an aspect of a process should be extended to include the aspects of interaction and collaboration among firms as well as an internal oriented aspect of a firm (Fearon, 2010; Ho et al., 2010).

Performance should include various measuring factors (Van Hoek, 1998). If it is measured by a single criterion, it cannot be correctly measured because firm performance reflects complex factors. From this viewpoint, various measuring factors should be developed for measuring performance. There are problems in existing measuring methods of performance; too biased internal measuring factors, cost oriented measuring factors, too many inaccurate measuring factors and a lack of awareness on supply chain contexts (Holmberg, 2000). Accurate measurement of performance has much difficulty in including issues concerned with the scope, such as whether it should measure intra- or inter-firm performance and what measuring methods it should use (Beamon, 1999; Cirtita and Glaser-Segura, 2012). Research about measuring performance could lead to a managerial viewpoint as to the most suitable process for firms and a strategic viewpoint for enjoying sustainable competitive advantages in the market. Compared with prior research, this research has originality concerned with the managerial and strategic viewpoints.

Research concerned with performance has appeared as theoretical research concerned with concepts, applicable scopes and measuring methods. However, research that measures performance of logistics service providers to connect with suppliers and customers in international logistics processes is lacking. Therefore, this research has three aims: one is to develop measuring criteria for measuring performance of customs clearance firms as

clearance experts, another is to test reliability and validity of measuring factors and the third is to analyze the relationship between customer service and firm performance.

2. Literature review

Literature review is conducted from two aspects: one is to investigate into customer service concerned with operational performance and the other is to ascertain firm performance through prior research on customer performance and financial performance.

2.1 Customer service

Customer service is recognized as a method for enjoying sustainable comparative advantages. By the construction of relationships focused on customers, firms enjoy the advantages as supplying services in conformity with customer needs. Factors of customer service can be supplied on the basis of measuring performance and it depends on customer needs (Collons et al., 2001).

Service quality is one of the major measuring factors to use generally for ascertaining customer needs. Customers' estimation on service quality is connected with customer satisfaction and customer loyalty. The viewpoints of service that appear in marketing research have an influence on the development of various measuring factors to measure service quality. In particular, research on customer service is focused on measuring service quality to customers (Durvasula et al., 1999).

Prior research on service quality was started by Parasuraman et al. (1985). and measuring factors developed by them have been comprehensively used by many researchers because they divided it into five sub-dimensions included 22 measuring factors and the sub-dimensions are divided clearly and exclusively. Therefore, the measuring factors have been used in much research projects.

Table 1.

Customer service in logistics research

Researchers	Methodology	Field of research	Measuring factors
Bask (2001)	theoretical research	Third party logistics providers	Routine TPL service, standard TPL service and customized TPL service
Chang and Chen (1998)	Empirical research	Market orientation and service quality	Tangibility, reliability, responsiveness, assurance and empathy

Researchers	Methodology	Field of research	Measuring factors
Collins et al. (2001)	Empirical research	Logistics customer service	Product availability, order cycle time, complete orders shipped, accurate invoices provided, damaged products
Durvasula et al. (1999)	Empirical research	Service quality of liners	Tangibles, reliability, responsiveness, assurance and empathy
Kent and Parker (1999)	Empirical research	Service quality of liners	Reliability, special equipment, PU & D, carrier salesmanship, rate, loss and damage, transit time, claims, expediting, rate charges service frequency, linehaul service, financial stability, scheduling flexibility, operating personal, service charge, equipment availability, tracing
Lopez and Poole (1998)	Case study	Service quality of port	Efficiency, timeless and security
Mehta and Durvasula (1998)	Empirical research	3PL logistics service	Assurance, responsiveness, reliability, empathy and tangible
Parasuraman et al. (1985, 1994)	Theoretical research	Service quality	Tangibles, reliability, responsiveness, assurance and empathy
Stank et al. (2001/2002)	Empirical research	Logistics integration and customer service	Customer focus, customer needs, customer response and flexibility

According to <Table 1>, measuring factors of service quality has been used in various fields concerned with logistics research such as logistics service, international logistics firms, liners and port management. However, customer service should be measured through their internal service process by service providers, whereas service quality should be measured by customers' response to service supplied. Both of them have different viewpoints: the former is the suppliers' viewpoints and the latter is the customers' viewpoints. In particular, research on service quality approaches service to customers' viewpoints but it originally comes from an internal process of service providers. Therefore, this research will approach from a viewpoint of service providers with customer service considered as customer focus, customer needs, customer response and flexibility (Stank et al., 2001/2002). It can measure a viewpoint of service providers on the basis of measuring factors of Parasuraman et al. (1985).

2.2 Firm performance

Looking for measuring methods of performance is a condition precedent to any suggestion of strategy for achieving sustainable competitive advantages in the market. Performance is measured by efficiency and effectiveness of the present system, which are used to design the total system of a firm for yielding the required levels of performance (Beamon, 1998). Therefore, a precondition for suggesting firms' strategy is to develop factors for measuring performance.

Measurement of performance is started from recognition of clear gaps among measuring factors in strategic, tactical and operational dimensions. The measurement in a strategic dimension has an influence on decision-making of top management, a financial plan of firms, a competitive advantage and goals of the organization. The measurement in a tactical dimension deals with measuring performance on the objective and procurement of resources in an objective to achieve specific performance of a strategic dimension. Measuring performance of the dimension can supply feedback on decision-making for managers. The measurement in an operational dimension requires practical data from workers and it estimates results of decision-making by field managers. Supervisors and workers should make an effort to create and attain operational goals (Gunarskaran et al., 2004).

Effective measurement of performance should include inclusiveness, universality, measurability and consistency (Beamon, 1999). If it is measured by a single criterion, it cannot be measured on the basis of the measuring criteria. Therefore, it is a condition precedent for measuring performance to develop measuring factors to achieve balance of financial and non-financial aspects and various criteria.

Measuring financial performance for balanced measurement is important for strategic decision-making and on the other hand, non-financial measurement from the viewpoints of tactics and operation is also important in daily operations. For this reason, it is important to consider non-financial aspects as well as financial aspects for measuring performance. For example, performance in a strategic aspect of customs clearance firms means customer performance such as market share, the collecting rate of customers and the maintaining rate of the number of customers acquired from customers and financial performance such as improving rates of sales and profit rates. In addition, performance from an operational aspect can be explained as customer services experienced by customers in the field. In addition, performance should reflect the viewpoint of the relationship between firms and it is connected with supply chain performance (Cirtita and Glaser-Segura, 2012; Morgan, 2004; Stewart, 1995; Van Hoek, 1998; Whitten et al., 2012). Therefore, performance of customs clearance firms can be understood as ascertaining that customer service has an

effect on customer performance and financial performance in strategic aspects.

Measuring performance in international logistics processes should include shippers as service demanders and service suppliers such as liners, freight forwarders, customs clearance firms and port logistics firms (Chow et al., 1994). The goals of logistics service providers are to satisfy customers more effectively and efficiently than their competitors (Lai et al., 2002). Therefore, service providers in an international logistics process should consider the performance viewpoint.

According to Innis and LaLonde (Innis and LaLonde, 1994), when customs clearance firms provide customers with an international logistics service, the cost of service providers is not an index of performance because a viewpoint of service demanders is more important than one of service providers. Customers want to be supplied with low cost services to correspond with their requirement. Therefore, service providers should develop customer services which can add value through cost-effective methods in a whole logistics process.

Performance in international logistics should emphasize service effectiveness as well as operational efficiency to coincide with the goals of all the logistics process participants, including service suppliers and demanders (Kleinsorge et al., 1991). Therefore, the performance of customs clearance firms as service providers in an international logistics process can be checked by financial performance and customer performance concerned with their strategic goals and these are affected by customer service in an aspect of an operational dimension.

3. Research model and hypotheses

3.1 Research model

According to the objectives of this research, there are two variables: on the one hand, customer service means ability to differentiate structure to draw in customers such as customer focus, customer needs, customer response and flexibility (Parasuraman, 1994; Stank et al., 2001/2002). To see each conceptual definition, customer focus means customer-oriented service designed to achieve customer satisfaction. Customer needs represent a degree of being satisfied through meeting the changing expectation of customers. Customer response stands for ability to adapt to the special requirements of customers. Flexibility explains ability to adapt to an unexpected change of environment. On the other hand, performance can be divided into customer performance and financial performance and it can be defined as a degree of achieving firms' goals. The relationship

between variables is as follows.

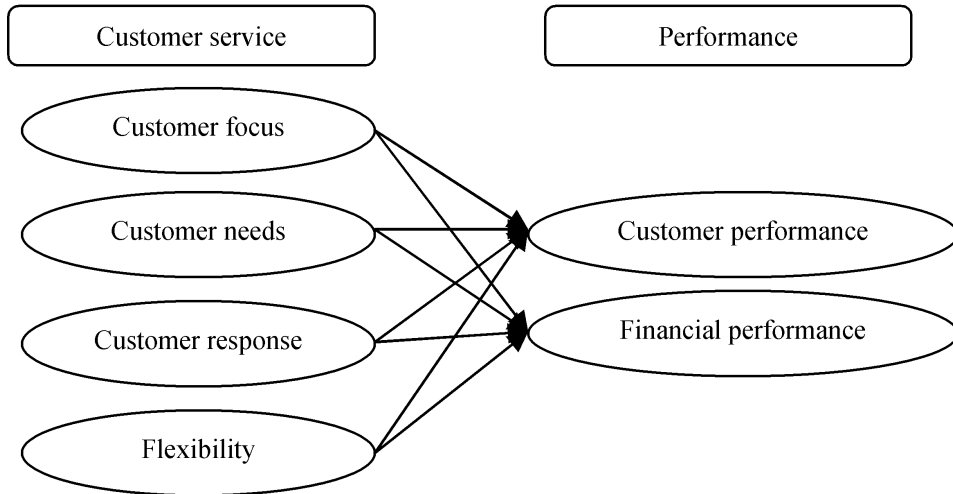


Figure 1.
Research model

3.2 Research Hypotheses

3.2.1 Customer service and performance

Firms that make a customer-oriented effort recognize service as a necessary exchange factor in the market to supply customers with great satisfaction. In addition, they want to respond better compared with responses of competitors about customer needs and consequently, their customer service is highly perceived by their customers. For this reason, firms which supply customers with a high quality of service can acquire a high market share (Bowen and Hedges, 1993) and they can enjoy high profits through price premiums (Philips et al., 1983). Therefore, high customer service has an effect on profits of firms and other financial performance (Greising, 1994; Reichhold and Sasser, 1990; Rust et al., 1995; Zeithaml et al., 1996).

Customs clearance firms play a role of providing shippers and consignees with customs clearance and accessory logistics services in an international logistics process. Their services are concerned with passing goods through a customs line: this is strong legal regulation and it can limit the flexible flow of goods. However, shippers wish to receive goods from customs clearance firms on time and in the correct place. In these

circumstances, the firms can achieve high quality customer service if their services are predictable, standard and flexible. Therefore, if they have customer-oriented services, make sustainable responses to meet customer needs, accept customers' special requests and are adaptable to a variety of environment, they can attain high profits and maintain customers for a long time. These firms can achieve high performance because they can enjoy sustainable competitive advantages in the market.

<H. 1> Customer focus (H. 1a), customer needs (H. 1b), customer response (H. 1c) and flexibility (H. 1d) has a positive effect on customer performance.

<H. 2> Customer focus (H. 2a), customer needs (H. 2b), customer response (H. 2c) and flexibility (H. 2d) has a positive effect on financial performance.

3.3 Definitions and measurement of variables

3.3.1 Operational definitions

This research developed measuring factors through prior research. Conceptual definitions of variables represented as above and operational definitions are as follows. Customer service is divided into four sub-dimensions. First, customer focus is measured as the degree of possession of discriminative clearance service compared with competitors (ser 1), the degree of application of various driving programs on work for customers' satisfaction (ser 2), the degree of using clearance and logistics requirements of customers for the customer segment (ser 3) and the degree of supplying value added service to customers through clearance and logistics services (ser 4). Second, customer needs are measured as the degree of contact with customers for confirming an environmental variation in the market (ser 5), the degree of reflecting customers needs in clearance and logistics processes (ser 6), the degree of contact with customers for supplying high quality of clearance and logistics services (ser 7), the degree of upgrading clearance and logistics processes through contact with customers (ser 8) and the degree of reflecting service requested by core customers in clearance and logistics services (ser 9). Third, customer response is measured as a degree of managing total clearance and logistics processes with customers (ser10), ability for responses to special demands for customers in clearance and logistics processes (ser11), ability for delivering goods by the predicted delivery date (ser12), ability for responses to meet core customers' needs (ser13) and ability for providing customers with additional services to meet customers' requirements (ser14).

Fourth, flexibility is measured as a degree of increased flexibility of operation through collaboration with customers (ser15), ability to meet changed requirements of customers in a whole process (ser16), ability for sustainable information sharing with customers for adapting to changed market environments (ser17), ability to supply value added service in a whole process (ser18) and ability to cooperatively solve the problems with customers if there are some problems (ser19) and all items are measured as perceptions on a seven Likert scale.

Performance is divided into customer performance and financial performance. The former is measured as the increased rate of a market share (per 1), the increased rate of collecting customers (per 2), the maintaining rate of the number of customers (per 3) and increased profits to customers (per 4), and the latter is measured as increased profit rates in total investment (per 5), increased rate of annual turnover (per 6) and increased rates of sales (per 7) and all items are measured as perceptions on a seven Likert scale.

3.3.2 Methods of sampling and data collection

The population of this research is customs clearance firms and they perform clearance services in the Republic of Korea. The sample frame is ascertained by a membership list of the Korean Customs Brokers Association. Firms must become a member of the association if they want to operate and therefore, this is the reason for choosing the list. According to Korean Customs Law, only customs brokers, customs broker incorporations or customs clearance firms can operate works of customs clearance because they have a license and all of them are members of the association. The object of this research is all of them (1,024 firms in 2009).

A questionnaire was sent to a staff of a customs clearance firm because they have very good understanding of clearance and perform their tasks in this field. It was collected by post, email, telephone, fax and personal visits. It was collected from 115 firms and the period of the survey was from March 2009 to June 2009. 112 questionnaires were used in the analysis because three questionnaires were inaccurate or unfaithful responses.

3.3.3 Methods of analysis

This research tries to test empirically the effect of customer service on firm performance of customs clearance firms. However, this research used variables used in logistics research because there is no prior research on customer service and performance of customs clearance firms. Therefore, this research should check reliability and validity of

variables through testing processes on purification of collected data for testing hypotheses. In this regard, this research used various methods for an analysis. First, content validity was ascertained by prior research, the mean of measuring factors and verification of experts. The conceptual and operational definitions of the variables are come from the prior research. The mean of measuring factors shows whether the contents of the questionnaire reflect the contents of the variables through pretest. The verification of experts explains whether items extracted by prior research reflect theoretical and managerial viewpoints. Second, estimates for data and purification are tested by three stages: the first is to perform data screening and evaluation of assumptions required in multivariate analysis, the second is to analyze item-total correlation, internal consistency and reliability and the third is to fulfill exploratory factor analysis for items. This process has various contents such as input of data in SPSS, multicollinearity test, linearity and normal distribution. Item-total correlation can be tested by a correlation relationship between items in each variable. Internal consistency and reliability can be verified by a Cronbach's alpha coefficient. Exploratory factor analysis for items is a method to extract items which explain a variable. Third, construct validity is ascertained by convergent and discriminant validity of data, which is tested by confirmatory factor analysis. The analysis is tested by analyzing a structural equation model (SEM). This research also fulfills average extract variance (AVE) and Cronbach's alpha coefficient for testing reliability. Discriminant validity is also tested by comparison of squared correlation coefficients with AVE. Fourth, SEM is used for testing the causal link between variables. The analysis is good for path analysis among variables. PASW 18.0 and AMOS 18.0 as the tools for the analyses are used in this research.

4. Results of empirical tests

4.1 General characteristic of responding firms

This research surveys customs clearance firms and collects 112 data to use for an analysis. Annual turnover of sample firms is as follows in <Table 2>.

Table 2.

Annual turnover of the firms (unit: US\$100,000)

Section	below 2	2-3	3-5	5-7	7-10	over 10	No answer	Total
Frequency	13	13	13	9	9	6	49	112
Ratio (%)	11.6	11.6	11.6	8.0	8.0	5.4	43.8	100

The annual turnover of responding firms shows that 39 firms are below US\$500,000 (34.8%) and six firms are over US\$1 million (5.4%). According to the results, many customs clearance firms are small size firms because they do not need to possess fixed assets. They have a specialized clearance system and their main work is executing customs clearance on behalf of shippers or consignees. In addition, no answer is 49 firms (43.8%), which is quite high. The reason is that their annual turnover is directly connected with information of customers and consequently, they treat with it as strictly confidential.

4.2 Reliability and validity tests

4.2.1 Content validity

Content validity explains a degree of properly representing contents of concepts measured by measuring factors. To insure it, this research borrows the concepts of variables from logistics research concerned with customer service and performance, estimates fit of the items by a pretest and carries out verification by experts. Prior research is the basis of measuring factors such as customer service, customer performance and financial performance of customs clearance firms. Customer service consists of 19 measurable items and for customer performance, there are four items and for financial performance, there are three items. Each item was used in logistics research but it needs to be properly amended for using in the current research. Therefore, amended items are used in this research. This research carried out a pre-survey of fitness on contents of the items about 30 staffs of customs clearance firms. According to <Table 3>, a result of fit has no problems because the average is over 4.0 in all items.

Table 3.

Average score of each factor

Factor	Ser 1	Ser 2	Ser 3	Ser 4	Ser 5	Ser 6	Ser 7	Ser 8
average	4.75	4.44	4.61	4.99	4.81	5.01	4.84	4.95
Ser 9	Ser10	Ser11	Ser12	Ser13	Ser14	Ser15	Ser16	Ser17
5.03	4.64	4.94	5.35	5.42	5.34	5.18	4.99	4.89
Ser18	Ser19	Per 1	Per 2	Per 3	Per 4	Per 5	Per 6	Per7
4.98	5.34	4.69	4.70	4.87	4.66	4.58	4.74	4.62

The next step gathers an opinion of experts on fit of items. There are five experts who are two professors, two customs clearance firms and one researcher. They participate in a process of verification as experts. All of them have research or practice experience of over five years. In the process, if items are judged as inaccurate by experts by over three, the items are deleted. As a result of the investigation, inaccurate factors are not found but there are some vague items and they were accurately amended after discussion with the experts. Therefore, items are ascertained as 19 customer services and seven performances for data collection through a survey. The items have content validity because there are the result of prior research, the estimate of fit on items by a pretest and the verification of experts.

4.2.2 Estimates for data and purification

The population of this research can be ascertained by a membership list of the Korean Customs Brokers Association. The survey was conducted to all customs clearance firms. Before an analysis, this research performs estimates and purification on data at three stages: one is to carry out data screening required in a multivariate analysis and evaluation of assumptions, another is to verify item-total correlation and the third is to examine internal validity and reliability through Cronbach's alpha coefficients.

The first stage is data screening that can test errors in the data and missing data. There are no problems except for some missing data. The missing data are substituted by an average replacement method of SPSS. In addition, confirmation of multicollinearity uses tolerance and MAX-VIF and if the tolerance coefficient ($1/\text{MAX-VIF}$) is over 0.1 and MAX-VIF coefficient is below 10, it explains that there is no problem in multicollinearity. According to the results, there is no problem in multicollinearity, such as customer focus (0.525, 1.903), customer needs (0.321, 3.118), customer response (0.529, 1.892) and flexibility (0.366, 2.730). In addition, normality is tested by Kolmogorov-Smirnov test and

the result is that customer focus has 0.417 in p value, customer needs has 0.264 in p value, customer response has 0.038 in p value, flexibility has 0.072 in p value, customer performance has 0.151 in p value and financial performance has 0.066 in p value. The result is good in normality excluding customer response but it is not departed from the criterion ($p > 0.05$). Linearity is tested by simple regression analysis and the result is 79.608 in F value, 0.420 in R square, 8.922 in t value, 0.000 in p value. This means that there is no problem in linearity.

The next stage analyzes item-total correlation and Cronbach's alpha coefficients for testing internal consistency. The result of analyzing the correlation on 19 items concerned with customer service shows one item (ser10) which is less than 0.5 in the coefficient and the result after deleting the item shows correlation coefficients from 0.510 to 0.804 and a Cronbach's alpha coefficient appears as 0.929. The result of seven items concerned with performance shows from 0.792 to 0.854 in correlation coefficients and a Cronbach's alpha coefficient is found as 0.949.

The next stage carries out exploratory factor analysis to use Varimax orthogonal rotation and principal component analysis. Each item is deleted if it has one of two characteristics: one is that the factor loading coefficient is less than 0.5 or the coefficient is found as more than 0.5 in over two factors and the other is to show less than 1.0 in Eigen value.

Table 4.

The results of exploratory factor analysis and reliability on customer service

Items	Factor 1 (flexibility)	Factor 2 (needs)	Factor 3 (focus)	Factor 4 (response)	Cronbach's alpha
Ser 1	0.243	0.116	0.787	0.334	0.881
Ser 2	0.196	0.253	0.847	0.025	
Ser 3	0.145	0.316	0.814	0.236	
Ser 6	0.353	0.756	0.129	0.316	0.913
Ser 7	0.385	0.662	0.415	0.146	
Ser 8	0.450	0.711	0.325	0.122	
Ser 9	0.392	0.695	0.123	0.355	
Ser11	0.243	0.380	0.327	0.735	0.826
Ser12	0.386	0.088	0.181	0.805	
Ser15	0.776	0.341	0.189	0.228	0.926
Ser16	0.829	0.269	0.224	0.154	
Ser17	0.667	0.349	0.302	0.046	
Ser18	0.767	0.359	0.265	0.086	
Ser19	0.781	0.243	0.173	0.318	
Eigen value	5.201	3.786	3.225	2.158	-
Variance (%)	28.895	21.034	17.916	11.990	-

According to <Table 4>, factor 1 is divided into five items which are flexibility and factor loading coefficients show from 0.667 to 0.829. It has 0.929 of a Cronbach's alpha coefficient. Factor 2, four items, is classified as customer needs and it suggests factor loading coefficients between 0.662 and 0.756. A Cronbach's alpha coefficient shows 0.913 (deleted ser 5). Factor 3 is customer focus and it is classified by three items and factor loading coefficients show from 0.787 to 0.847. It has 0.881 of a Cronbach's alpha coefficient (deleted ser 4). Factor 4 is explained as customer response of two items and factor loading coefficients show from 0.735 to 0.805. A Cronbach's alpha coefficient shows 0.826 (deleted ser 10, 13 and 14). Five items of total measuring items are deleted because they do not fit in measuring criteria and therefore, customer service is explained by 14 items.

Table 5.

The results of an exploratory factor analysis and reliability on performance

Items	Factor 1 (customer)	Factor 2 (financial)	Cronbach's alpha
Per 1	0.840	0.404	0.933
Per 2	0.828	0.455	
Per 3	0.812	0.467	
Per 5	0.438	0.831	0.884
Per 7	0.392	0.856	
Eigen value	3.105	3.052	-
Variance (%)	44.362	43.594	-

According to <Table 5>, factor 1 represents customer performance and it has factor loading coefficients between 0.812 and 0.840. A Cronbach's alpha coefficient of the factor shows 0.933 (deleted per 4). On the other hand, factor 2 can be explained as financial performance and it has the coefficients from 0.831 to 0.856. A Cronbach's alpha coefficient shows 0.884 (deleted per 6). Two items are deleted because they do not fit in the criteria and therefore, total five items explain performance as measuring factors.

4.2.3 Construct validity

This research estimates convergent validity and discriminant validity for testing construct validity; these are tested by confirmatory factor analysis. Convergent validity

means whether items explain a variable. This analysis used a maximum likelihood method with AMOS 18.0. Confirming goodness of fit of this research model is used in five indices: p value on chi-square (criterion: ≥ 0.05), Q (chi-square / df) (criterion: < 2), AGFI (criterion: ≥ 0.80), CFI (criterion: ≥ 0.90), RMSEA (criterion: < 0.08) (Baumgater and Homburg, 1996; Segars and Grover, 1993).

Table 6.

Fitness estimate of a model on customer service

Model	Chi-square	df	Q	AGFI	CFI	RMSEA
Original	135.441*	71	1.90	0.794	0.950	0.090
Amend I	120.538*	67	1.79	0.794	0.958	0.085
Amend II	102.944*	65	1.58	0.814	0.970	0.073

Note) *: $p < 0.05$

According to <Table 6>, fitness indices in an original model of customer service are not satisfactory because all indices excluding Q and CFI do not reach the criteria. In this situation, modification indices are used for improving fit indices of the model and therefore, it is improved in the indices in amended model I and II. In addition, according to <Table 8>, factor loading coefficients of items are shown as more than 0.5 in all items. These results mean that items in the final model make sure of convergent validity.

Table 7.

Fitness estimate of a model on performance

Model	Chi-square	df	Q	AGFI	CFI	RMSEA
Original	4.014	4	1.000	0.949	1.000	0.006

According to <Table 7>, the model on performance has no problems in fit indices. In addition, factor loading coefficients of measuring items show more than 0.5 in all items according to <Table 9>. These results mean that items in the original model have no problem in convergent validity.

Convergent validity can be also tested by analyzing SEM so that each item has a meaningful factor loading coefficient (Anderson and Gierbing, 1988). A criterion of the coefficients should be more than 0.5 for confirmation of validity and it is better for validity

to show more than 0.7 in the coefficient. For a strict test of the validity, there is an additional test by average variance extracted (AVE). It means a squared correlation coefficient and if it is larger than 0.5, it means that the item has reliability and convergent validity.

Table 8.

The results of testing convergent validity on customer service

Variables	Items	Factor loading	AVE	Estimate	P
focus	Ser 1	0.822	0.697	0.943	0.000
	Ser 2	0.792		0.883	0.000
	Ser 3	0.887		1.000	-
needs	Ser 6	0.822	0.729	0.927	0.000
	Ser 7	0.862		1.162	0.000
	Ser 8	0.907		1.210	0.000
	Ser 9	0.821		1.000	-
response	Ser11	0.914	0.695	1.291	0.000
	Ser12	0.745		1.000	-
flexibility	Ser15	0.877	0.723	0.984	0.000
	Ser16	0.883		1.012	0.000
	Ser17	0.760		0.820	0.000
	Ser18	0.868		1.022	0.000
	Ser19	0.856		1.000	-

According to <Table 8>, factor loading coefficients show over 0.7 and AVEs also represents over 0.5 in all items. These reflect the fact that all items have no problem in convergent validity. Next is a result of testing convergent validity on performance.

Table 9.

The results of testing convergent validity on performance

Variables	Items	Factor loading	AVE	Estimate	P
Customer performance	Per 1	0.882	0.825	0.962	0.000
	Per 2	0.930		1.018	0.000
	Per 3	0.912		1.000	-
Financial performance	Per 5	0.909	0.800	0.909	0.000
	Per 7	0.879		1.000	-

According to <Table 9>, performance has no problem in convergent validity because factor loading coefficients show over 0.7 and AVEs also show over 0.5 in all items.

Discriminant validity means whether the relationships among variables are discriminative. It means that the lower the correlation, the higher the discriminant validity between variables. The analytical method compares AVE with a squared correlation coefficient of each item as an analyzing method on testing the validity (Segars, 1997). For verifying the validity, AVE should be larger than the squared coefficient of each correlation coefficient of the variable. The result is as follows.

Table 10.

The result of correlation analysis

Variables	Focus	Needs	Response	Flexibility	Customer	Financial
Focus	1.000					
Needs	0.626* (0.392)	1.000				
Response	0.554* (0.307)	0.629* (0.396)	1.000			
Flexibility	0.552* (0.305)	0.781* (0.610)	0.634* (0.402)	1.000		
Customer	0.619* (0.383)	0.531* (0.282)	0.549* (0.301)	0.532* (0.283)	1.000	
financial	0.577* (0.333)	0.345* (0.119)	0.395* (0.156)	0.351* (0.123)	0.808* (0.653)	1.000

Notes) Numbers of parenthesis are a squared correlation coefficient of a factor. *: $p < 0.01$

According to <Table 10>, AVE coefficients (Table 8 and Table 9) in all measuring variables show greater than squared coefficients of each correlation. These results can prove that all measuring factors have discriminant validity. This verifies reliability and validity of variables through purification of collected data as above. Depending on the results, there are no problems in content validity, estimates and purification on data and construct validity through estimating convergent validity and discriminant validity of the data. Therefore, this research can analyze causal links among variables through analyzing SEM.

4.3 Testing hypotheses

The relationship between variables for achieving the objectives of this research is verified as follows. The results are as follows in <Table 11>.

Table 11.

The results of testing hypotheses

H	Path	Estimate	S.E.	C.R.	P	Result
1a	focus→customer	1.638	0.319	5.135	0.000	supported
1b	needs→customer	-0.971	0.335	-2.900	0.004	not supported
1c	response→customer	-0.395	0.268	-1.473	0.141	not supported
1d	flexibility→customer	0.520	0.252	2.069	0.039	supported
2a	focus→financial	2.290	0.470	4.869	0.000	supported
2b	needs→financial	-1.477	0.469	-3.148	0.002	not supported
2c	response→financial	-0.701	0.381	-1.840	0.066	not supported
2d	flexibility→financial	0.560	0.339	1.652	0.099	supported

Notes) Focus: customer focus, needs: customer needs, response: customer response, flexibility: flexibility, customer: customer performance, financial: financial performance

Goodness of fit indices of the SEM is as follows: chi-square = 253.531 (df = 134, p = 0.000), GFI = 0.825, AGFI = 0.752, NFI = 0.878, IFI = 0.939, CFI = 0.937, RMSEA = 0.090. The results of the analysis are as follows. It explains that customer focus has a positive effect on customer performance and financial performance (supported H. 1a and H. 2a). Therefore, customs clearance firms that make an effort to develop customer-oriented programs designed to achieve customer satisfaction can attain a high level of the rates of market share, attracting customers, maintaining customers and the rates of total invested profits and profits of sales. Customer needs are shown as a negative effect on customer performance and financial performance (not supported H. 1b and H. 2b). In addition, customer response has a negative effect on the performances (not supported H. 1c and H. 2c). Flexibility has a positive effect on the performances (supported H. 1d and H. 2d). Therefore, customs clearance firms which have a high level of ability to adapt to unexpected environmental variance can achieve the high level of the rates of market share, attracting and maintaining customers and the rates of the total invested profits and sales

profits. Customer service such as customer focus and flexibility is one of core means to have an influence on success for customs clearance firms and they can enjoy sustainable competitive advantages through achieving them in the market. However, comparative advantages following cost efficiency can make high market share in a short time but it cannot continue in the market for a long time because it can be easily imitated by competitors. On the other hand, customer service can work on a source to enjoy long-term comparative advantages because comparative advantages following service effectiveness constructed for a long period cannot be easily imitated. Therefore, they should enhance customer service through the strategy of differentiation as well as cost leadership and this can improve firm performance such as customer performance and financial performance.

5. Conclusion

This research has three objectives: the first is to develop measuring factors for ascertaining performance of customs clearance firms, the second is to test reliability and validity of the factors and the third is to analyze the relationship between customer service and firm performance. For achieving the objectives, this research suggests conceptual and operational definitions of variables and verifies the relationship between variables. Questionnaires made by prior research are sent to customs clearance firms for a survey and this research analyzes the data collected by means of 112 questionnaires. The relationship between variables is proposed by a research model and it is explained by hypotheses. PASW 18.0 and AMOS 18.0 are used for an analysis and the results are ascertained by four stages: the first is to test content validity, the second is to investigate estimates and purification on data, the third is to examine construct validity and the last is to analyze the SEM. The implications on the result of analyses are as follows.

First, customs clearance firms should develop their clearance programs to satisfy customers and they should supply superior customer service for customers; that is, they should have superior clearance service compared to competitors, they should have service processes to achieve customers' wishes and they should provide customers with differentiated service following customer needs. As a result of superior customer service, they can enjoy high customer performance and financial performance. Second, they should have ability to cope flexibly with unexpected environmental variance. For that, they need to perform as follows. They should flexibly operate their systems with related logistics firms through collaboration, cope quickly with changes in the requests of customers in clearance processes, make quick responses about environmental variance through sustainable

information sharing with business partners and provide customers with services to add value in the clearance process. In addition, they should have ability to cope cooperatively with related logistics firms when they face some problems concerned with logistics services.

Managerial implications of this research are as follows. First, research on customer service of customs clearance firms can suggest methods that could improve their practical services because it is for themselves to check their services. Hence, they can evaluate their services and then they can enhance the services. In addition, shippers can be supplied with high quality services. Second, criteria for measuring performance should measure financial and non-financial aspects together and it should also measure internal and external aspects of firms together. This research uses three core variables: customer service, customer performance and financial performance. Customer service can measure non-financial performance as well as external aspects of firms, whereas customer performance can measure inter-firm performance. In addition, financial performance can measure financial and internal aspects of firms. Therefore, customs clearance firms can fully understand significant strengths and weaknesses through detailed measurement on variables of this research and they can gain competitive advantages in the market if they reflect it when they make strategic plans.

Limitations of this research are as follows. First, a chi-square coefficient of a structural model adopted an alternative hypothesis and it can be explained as the model does not reflecting the population. However, it depends on the number of data. Therefore, if the number of data is increased, the coefficient will be improved. Second, it needs to develop various variables to measure performance. Customer service, customer performance and financial performance used in this research are useful instruments to analyze performance but it need to be analyzed more widely. Third, it needs to develop various sub-dimensional measuring items. It is possible that the larger the various items, the better the explanation of variables. Fourth, it appears that customer response and customer needs have a negative effect on performance. It is contrary to the results of prior research and this means that it needs to analyze the results in deeply. Research concerned with performance to reflect limitations of this research is required in the future.

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