

Empirical Analysis of the Customer Loyalty Problem in the International Logistics Market

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Abstract: In this study the focus was on comprehending the vital factors that affect the loyalty of international logistics service provider (ILSP) customers, with the aim of providing recommendations for sustainable operations. Empirical analysis was performed to explore the customer loyalty problem in the international logistics market. Data for analysis was collected by questionnaire survey directed at customers of an ILSP headquartered in Taiwan, with branches located around the world. The customer loyalty problem was first tackled by developing a conceptual framework. The structural equation modeling method was then used to do the empirical analysis. Causal hypotheses regarding the loyalty of customers for ILSPs were established based on their special attributes and related research results reported in the literature. Empirical analysis results of this study show that service quality, customer satisfaction and switching cost are all critical to customer loyalty. Of these, customer satisfaction and switching cost both have a positive relationship with customer loyalty; service quality has a positive influence with customer satisfaction, as well as an indirect positive influence with customer loyalty; there is a positive relationship between customer satisfaction and switching cost. Research and managerial implications for practical operations are also discussed.

Key-Words: Customer loyalty, International logistics market, Logistics service provider, NVO

1 Introduction

Developing customer loyalty has been recognized as an indispensable issue for business firms in pursuit of sustainable operations in the current competitive business environments. Non-Vessel-Own (NVO) common carriers, also known as international freight forwarders, are one type of international logistics service providers (ILSPs) whose professional goal is to provide international logistics services, mainly through shipping and intermodal transportation arrangements. The NVO market in Taiwan is characterised by the conditions of increasing operating costs and changing industry environments. How to maintain a competitive advantage while maintaining stable business operations has become a critical factor for survival. Additionally, the situation where the company has to offer the “lowest freight rate”, traditionally the operational tactic adopted by most Taiwan NVOs has backfired because the marginal profits yielded are no longer enough for the company to survive. Moreover, since the service contents provided by NVOs are similar and easily be replaceable by other NVOs, the provision of tailored services through non-price tactics has become quite

essential for those eager to maintain sustainable operations.

Cronin et al. [1] and Lee et al. [12] indicated that service quality is an antecedent of customer satisfaction and repurchase intentions. Lee et al. suggested that “customer satisfaction exerts a stronger influence on purchase intentions than does service quality.” Fonvielle [6] stated that customer satisfaction is a key factor by which business firms maintain sustainable operations in a competitive market. Therefore, how to fulfil customers’ needs so as to retain customer loyalty while at the same time maintaining profitability has become a necessary market strategy for NVOs facing the challenge of a complex and competitive business environment. From the viewpoint of the customers, the competitiveness of NVOs under such conditions would be derived from how good their services are, or how satisfied their customers feel with the services rather than how low the freight rate offered. However, only providing good quality of services does not necessary guarantee a high level of customer loyalty to the NVO. Additionally, the results of the aforementioned study indicate that

factors that were not previously known to affect NVO customers were found to affect customer loyalty. Therefore, in this study the focus is on comprehending what vital factors affect the loyalty of ILSP customers. This was done through an empirical study of customer loyalty in the NVO market. We first developed a conceptual framework, and then used structural equation modeling to do empirical analysis. An NVO headquartered in Taipei, Taiwan with branches located around the world serving customers from a variety of strata was sampled via questionnaire survey to collect necessary data for model analysis. Causal hypotheses regarding the customer loyalty of NVOs were established based on their special attributes and related research results reported in the literature.

In the following sections we first present the conceptual model with the proposed hypotheses. Then we illustrate the structure of the measurement model used to formulate each construct designed in the conceptual model. In the fourth section the results of empirical analysis are discussed while research and managerial implications for practical operations are discussed in the fifth section. Conclusions and recommendations for future research are drawn in the last section.

2 Conceptual Model and Hypothesis

2.1 Conceptual Model

The conceptual definition and measurement of loyalty have been exclusively discussed in the marketing literature. For example, Rundle-Thiele [16] stated that, a multi-dimensional view points need to be used “to encompass a far boarder range of loyal states and qualities to benefit both customers and marketers.” However, inconsistent results regarding the antecedents of customer loyalty can be found in the literature. For example, it has been found that customer satisfaction does have a positive influence with customer loyalty, the positive relationship between service quality and customer loyalty is not always significant [5, 17]. In addition, Ruyter et al. [17] studied the relationship between perceived service quality, service loyalty and switching cost across five different service industries, including health centers, city theatres, fast food, supermarkets, and amusement parks; they categorized the first two industries as high switching-cost types, and the other three as low switching-cost types. The results also indicated that “loyalty-elasticity” across service industries seems to exist, and that customers show less loyalty in service

industries with low switching costs than in those with high switching costs.

Working from the aforementioned research results, the intention of this study is to show that customer loyalty is worth of the NVOs’ attention, and that service quality, customer satisfaction as well as switching cost, each have a positive influence with customer loyalty. Furthermore, we intend to identify the impact of service quality on customer satisfaction, and investigate whether high switching costs exist for satisfied customers who turn to other NOV. The conceptual framework of this study is schematically depicted in Fig.1. The abbreviations SQ, SA, SC, and CL (in the figure) represent service quality, customer satisfaction, switching costs, and customer loyalty, respectively.

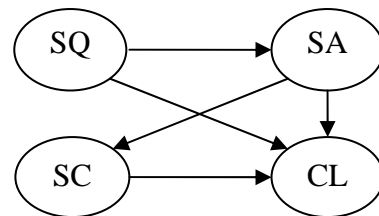


Fig. 1 Conceptual Framework

2.2 Hypothesis Development

According to the literature on service marketing, there exists a positive relationship between service quality and customer satisfaction, although the relationship may be direct or indirect, depending on the nature of the study. [2, 5, 11, 12, 14, 19] The research results of Lee et al. indicated that customers may perceive the quality of services immediately after the service consumption as well as at a later time, and compare their perceptions. They also showed that perceived service quality is an antecedent of customer satisfaction for people-based and facility/equipment-based firms.

An NVO is just such a service providing and people-based company; therefore we posit that good quality of service will lead to improvement in customer satisfaction, as stated in the hypothesis proposed below.

H1: There is a positive relationship between service quality and customer satisfaction.

One significant outcome of past research into customer satisfaction has been the proposition of a customer satisfaction index. Important customer satisfaction indices include the Swiss Index of Customer Satisfaction (SWICS), the ‘Sverige

Kundbarometer' and the 'Deutches Kundenbarometer' [4], the American Customer Satisfaction Index (ACSI) [7], and the 1999 European Customer Satisfaction Index (ECSI). The results of the ACSI study indicated that perceived service quality is an important antecedent of customer satisfaction. Zeithaml et al. [19] also showed that customer behavioral consequences are influenced by service quality. In addition, Binter [3] reported that customer satisfaction is one of the antecedents of customer loyalty and has a positive influence on customer loyalty. Reichheld and Sasser [15] stated that satisfied customers are more loyal to service providers and hence are likely to have higher repurchase intentions. Haskett [9] pointed out that customer loyalty is derived from customer satisfaction. Anderson and Sullivan [1] also reported that high repurchase intentions come with satisfied customers. Shoemaker and Lewis [18] indicated that customer satisfaction is a necessary condition for customer loyalty.

Based on the above findings, for service providers like NVOs, we propose the following two hypotheses:

H2: There is a positive relationship between customer satisfaction and customer loyalty.

H3: There is a positive relationship between service quality and customer loyalty.

Ruyter et al. [17] showed that the relationship between switching costs and customer loyalty is positive, but the positive level of the effect varies with the industry type, that is whether it is associated with high or low switching costs. In other words, industries with high switching costs will have high customer loyalty and those characterized by low switching costs will have low customer loyalty. This means that in the NVO market, where cutting freight charges is a common tactic, we can posit that the switching cost has a positive influence on customer loyalty, since switching costs involve more than just out-of-pocket costs. In addition, we speculate that customers with high satisfaction will bear in mind the high switching costs that exit for turning to other service providers. The following two hypotheses can be stated:

H4: There is a positive relationship between customer satisfaction and switching costs.

H5: There is a positive relationship between switching costs and customer loyalty.

Research results of Cronin et al. indicated that the indirect effect of service quality on behavioural intentions through customer satisfaction in the service environment is significant. Therefore, two indirect relationships are of practical interests in the current study, namely, whether service quality has a significant indirect influence on customer loyalty through customer satisfaction, and whether customer satisfaction has a significant indirect influence on customer loyalty through switching costs. The proposed hypothesis is stated as follows:

H6: Service quality and customer satisfaction each has a positive indirect influence on customer loyalty.

3 Methodology

3.1 Measurement Development

The study model depicted in Figure 1 contains four latent variables (or constructs), which are: service quality, customer satisfaction, switching costs, and customer loyalty. All constructs were measured indirectly via a multiple-item scale. The service quality was measured using an expanded version of the SERVQUAL scale originally developed by Parasuraman et al. [14]. The original scale developed by Parasuraman et al. included the service dimensions of reliability, responsiveness, assurance, empathy, and tangibles. In this study we replaced 'tangibles' with 'professionalism' which better reflects the fact that NVOs are people-based service providers and do not physically possess any modes of transportation. Four questions regarding "coverage of service networks", "feasibility of routing recommendations", "efficiency of shipping order processing", and "cargo-tracing capability" were designed to operationalize the level of professionalism.

Customer satisfaction was conceptualized as a measure of overall customer satisfaction for the services provided by the NVOs. Overall customer satisfaction was operationalized through adoption of the three survey measures used in the ACSI, that is: (1) an overall rating of satisfaction (termed SA1); (2) the degree to which performance falls short of or exceeds expectations (termed SA2); and (3) a rating of performance relative to the customer's ideal service (termed SA3).

As noted by Ruyter et al., switching costs can be defined as the costs incurred due to changing from one service provider to another. The switching cost was conceptualized as the loss of customers who

turns to a new NVO for service. The loss was defined in terms of the costs of time, money and effort, as originally proposed by Ruyter et al. Customer loyalty was measured via three commonly used indicating factors, that is: word-of-mouth communications, purchase intentions and price sensitivity. The measurement items for each indicating factor of the customer loyalty were modified from the scale proposed by Zeithamal et al.

The research model developed according to the above design is presented in Fig. 2. Details of the set of questionnaire items for each construct of the research model are illustrated in the Appendix. The scoring format for each questionnaire item was a five-point Likert-type scale ranging from "1 = strongly disagree" to "5 = strongly agree" with "3 = fair."

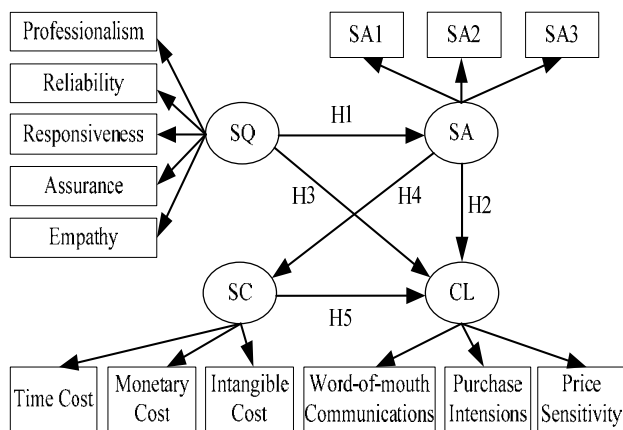


Fig. 2 Research Model

3.2 Sampling and Data Collection

The customers of a NVO headquartered in Taipei, Taiwan with branch offices and agents distributed globally constituted the sample base for this study. The firm provides international freight forwarding through shipping, airfreight forwarding, inland transportation, transshipment handling, and also provides warehousing and distribution services, as well as a logistics consulting service. Three-year historical transaction data, ranging from November 1st, 2002 to October 31, 2005, including a total of 1550 pieces of data were used in this study. Types of customers included shippers and NVOs. Customer type and transaction frequency (whether more than one time or less than one time of transaction) were taken into consideration as criteria during sampling. Half of the samples from each trait were then selected randomly to perform the questionnaire

survey. The sum of the sampled data was 775, with 620 samples being shippers and 155 samples NVOs.

Data for model testing were collected via questionnaire survey. Each questionnaire contained four variable measurement sections and one section of demographic questions. In an effort to improve the response rate, not only was the mailing method used but also personnel interviews were employed. A pre-test of questionnaire on managers of the studied NVO and logistics experts was also performed to ensure the quality of the outcomes. The pre-test resulted in one modification of the service quality measure and several rhetorical revisions. The respondents for the questionnaire were selected based on their knowledge of the aspects researched. A total of 775 questionnaires were sent, resulting in 261 useable responses after follow-up of the sales persons of the studied NVO, representing a response rate of 33.68%.

Of the 261 useable questionnaires, 31 of were from NVOs and 230 from shippers. Of the 230 samples of shippers, 80% of them were international trading firms, about 13% were manufacturers and about 7% were unknowns. Detailed information regarding the compositions of samples is summarized in Table 1. In terms of the identity of the respondents, the majority were operational managers (OP) (for the NVO group), and shipping personnel (for shipping group). Each group also contained approximately 10% with unknown identities. Regarding the company size of the samples, most companies had 5-50 employees, for both the surveyed NVOs and shippers. A company size of up to fifty employees made up about 95% of the samples for both the responding NVOs and the shippers. In terms of the cooperative experience between the respondents and the studied NVO more than 60% of the sampled NVOs, and around 91% of the sampled shippers, had up to ten years of cooperation, but there were about 6% of unknowns for both responding groups.

Information regarding the average annual shipment for both groups of samples and their transaction records with the studied NVO are summarized in Table 2. Although there were about 65% and 50% of unknown respondents for either the sampled NVOs or shippers, we can still recognize that the surveyed NOVs were more reluctant to disclose possibly sensitive business information to the public than were shippers. The amount shipped annually tended to be less for the surveyed NOVs than for the shippers. These two observations clearly indicate that NVOs are actually competitors with each other, although they currently have to cooperate with each other purely for business reasons. This also

reflects the fact that the international logistics market is quite a competitive one.

4 Empirical Analysis and Results

4.1 Descriptive Statistics and Analysis of the Measurement Model

Table 3 illustrates the correlation matrix and descriptive statistics for the study variables, where the mean of each variable is above 3 on the 5-point Likert scale. The standard deviations for the variables range from 0.49 to 0.66 with the mean equal to 0.57, which indicate consistent responses. The values of the correlations range from 0.51 to 0.81 with the mean being 0.65. The strength of the association between the constructs indicates that the loyalty of the NVO customers is closely associated with the proposed affecting factors. For a much stronger test confirmation, the hypotheses were tested by the structural equation modeling (SEM) method using the computer software AMOS (Analysis of Moment Structures) [10].

Table 1 Sample Compositions

	Category	NOVs	Shipper
Identity of Respondent	OP/ Shipping personnel	67.74%	77.39%
	Managing director	19.35%	10.00%
	President	3.23%	1.30%
	Unknown	9.68%	11.30%
Company Size (persons)	< 5	6.45%	23.04%
	5 - 50	74.19%	64.78%
	> 50	12.90%	8.70%
	Unknown	6.45%	3.48%
Cooperative Experience (years)	< 5	22.58%	71.03%
	5 - 10	38.71%	20.87%
	> 10	32.26%	2.61%
	Unknown	6.45%	5.22%

Structural equation modeling is a method for simultaneously examining a series of interrelated dependence relationships among the measured variables and latent constructs as well as between several latent constructs. The SEM process can be divided into two steps, the development of the

measurement model, and the development of structural model. The measurement model specifies the indicators for each construct and enables an assessment of construct validity while the structural model is a set of one or more dependence relationships linking the constructs of the hypothesized model [8]. The measurement model specified in this study is over-identified since it has more equations (i.e., 105) than parameters (i.e., 33).

Table 2 Shipment and Transaction Information from the Surveyed Samples

Average Annual Shipment	NVOs		Shipper	
	Sample Number	Annual Transaction Record with the Studied NVO	Sample Number	Annual Transaction Record with the Studied NVO
CL*				
< 50 TEU*	2 (6.45**)	5 (16.13)	45 (19.57)	95 (41.30)
50 - 200 TEU	3 (9.68)	4 (12.90)	32 (13.91)	13 (5.65)
> 200 TEU	6 (19.35)	0 (0.00)	43 (18.7)	2 (0.87)
Unknown	20 (64.52)	22 (70.97)	110 (47.83)	120 (52.17)
LCL*				
< 500 CBM*	4 (12.90)	9 (29.03)	63 (27.39)	91 (39.57)
500 - 1000 CBM	2 (6.45)	1 (3.23)	8 (3.48)	9 (3.91)
> 1000 CBM	5 (16.13)	0 (0.00)	37 (16.09)	6 (2.61)
Unknown	20 (64.52)	21 (67.74)	122 (53.04)	124 (53.91)

* CL: Container Loading; LCL: Less than Container Loading; TEU: Twenty Equivalent Unit; CBM: Cubic Meter

** Percentage

Table 3 Descriptive Statistics for Study Constructs

Variable	Mean	Standard Deviation	Intercorrelation			
			SQ	SA	SC	CL
SQ	3.88	0.49	1.00			
SA	3.72	0.56	0.81	1.00		
SC	3.36	0.66	0.51	0.56	1.00	
CL	3.38	0.56	0.65	0.69	0.66	1.00

The items used to measure the constructs in this study were adopted from scales used in the related literature that have been found to be valid and reliable. Moreover, a pre-test with logistics experts and NVO managers was also employed to ensure that the items fell under the domain of the construct. The validity of the questionnaire items was significant, since the loading of all items' on their corresponding construct were higher than 0.4, ranging from 0.75 to 0.94. The reliability of the designed questionnaire is also significant, since the Cronbach alpha values for each measurement item (SQ, SC, SA and CL) were all higher than 0.7, as recommended in Hair et al. The Cronbach alpha values for each measurement item for SQ were that professionalism is 0.81, reliability is 0.86, responsiveness is 0.84, assurance is 0.86, and empathy is 0.88. The Cronbach alpha value for the measurement items for SA is 0.85; the Cronbach alpha values for each measurement item for SC were that time is 0.90, money is 0.86 and intangible is 0.92; the Cronbach alpha values for each measurement item for CL were that word-of-mouth communications is 0.89, purchase intention is 0.81 and price sensitivity is 0.86.

Overall measurement quality of the proposed model was assessed using confirmatory factor analysis (CFA), which is a way of testing how well measured variables represent a smaller number of constructs. The validity of the measurement model depends on the goodness-of-fit for the measurement model and specific evidence of construct validity. Construct validity, the "extent to which a set of measured items actually reflects the theoretical latent construct they are designed to measure" [8], of the proposed measurement model can be assessed through CFA. The results of CFA are shown in Table 4. As can be seen from Table 4, all loadings exceed 0.7 except one which exceeds 0.5; however all loadings exceed the recommended value of 0.4 [8]. The value of variance-extracted percentages (VE) for each construct is greater than 0.6, suggesting adequate convergent validity. The values of construct reliability (CR) all exceed 0.8, indicating adequate convergence or internal consistency. The Cronbach's alpha is above 0.75 for each scale, exceeding the recommended cut-off point of 0.7 [8]. Discriminant validity, the extent to which a construct is truly distinct from other constructs, was assessed via the comparison of the variance-extracted percentages for any two constructs with the square of the correlation between these two constructs [8]. All variance extracted estimates from Table 4 are greater than the corresponding interconstruct squared correlation estimates in Table 5. Therefore, this test suggests that the measures have discriminant validity. In addition,

a number of goodness-of-fit indices were used to assess practical significance that is χ^2/df , GFI, AGFI, NFI, RMR, and PGFI. The AMOS outputs, as compiled in Table 4, show an adequate model fit.

Table 4 Results of CFA

Construct	Indicator	Loading*	CR	VE	Cronbach's alpha
SQ	Professionalism	0.87	0.94	0.75	0.93
	Reliability	0.91			
	Responsiveness	0.87			
	Assurance	0.90			
	Empathy	0.79			
CL	Word-of-mouth Communications	0.84	0.88	0.72	0.76
	Purchase Intentions	0.91			
	Price Sensitivity	0.54			
SC	Time Cost	0.82	0.84	0.64	0.83
	Monetary Cost	0.73			
	Intangible Cost	0.84			
SA	SA1	0.84	0.85	0.66	0.85
	SA2	0.80			
	SA3	0.79			
χ^2	239.292				
df	72				
χ^2/df	3.324				
GFI	0.874				
AGFI	0.816				
CFI	0.942				
NFI	0.919				
RMR	0.026				
PGFI	0.599				

*Significant at $p < 0.01$

4.2 Structural Model and Hypothesis Testing

How well the proposed structural model reproduces the observed covariance, and the significance and direction of the hypothesized paths, were evaluated. The evaluation results are illustrated in Table 5, where the R^2 -values for SA, CL and SC are 0.8, 0.794 and 0.389, respectively. The relative ability of the research model to explain variation in customer loyalty was 0.596, indicating the good fit of the proposed model.

The test results shown in Table 6 indicate that Hypotheses H1, H2, H4, and H5 as noted in Fig. 2

were strongly supported, except that Hypothesis H3 was not supported. The path loadings between the latent variables for hypotheses H1, H2, H4, and H5 had positive parameters and magnitudes that support the theoretical causal relationships. Moreover, the analysis of the mediating effect, following the steps recommended by Hair et al, was also supported. Namely, the analysis results revealed that the path coefficient between SQ and CL changed from 0.53 to 0.111, indicating that the significant positive relationship between SQ and CL became non-significant when SA intervene between them; the path coefficient between SA and CL changed from 0.63 to 0.52, indicating that the positive relationship between SA and CL remained significant. Specifically, these two results show that the full mediation effect of SA on the relationship between SQ and CL was supported, and the partial mediation effect of SC on the relationship between SA and CL was supported. That is, SQ has an indirect effect on CL through SA, with a value of 0.466, and SA does not have an indirect effect on CL through SC.

Table 5 Construct Correlation Matrix for the Studied Model (Standardized)

Construct	SQ	SA	SC	CL
SQ	1.00	0.65	0.26	0.42
SA	0.81	1.00	0.31	0.48
SC	0.51	0.56	1.00	0.44
CL	0.65	0.69	0.66	1.00

Note: Values above the diagonal are squared correlations

Table 6 Path Analysis Results of the Structural Model

Dependent Variable	Standardized Path Coefficient	Independent Variable	R ²
SA	0.895*	SQ	0.8
CL	0.111	SQ	0.794
	0.521*	SA	
SC	0.359*	SC	0.389
	0.623*	SA	

*Significant at $p < 0.001$.

5 Discussion and Implications

In this study we focused on the issue of NVO customer loyalty and the underlying idea of improving the sustainability of their operations. The

empirical results described in the preceding section indicate that the research model fits well with the data collected. More importantly, the research results confirm the objective of this research, namely that it is important in the international logistics market to pay attention to customer loyalty. The results of empirical analysis suggest that service quality and customer satisfaction, customer satisfaction and customer loyalty, customer satisfaction and switching cost, as well as switching cost and customer loyalty, all have a positive relationship. Furthermore, service quality has a positive indirect influence on customer loyalty through customer satisfaction instead of a positive direct relationship. This might be explained by the fact that good quality of service does not itself guarantee satisfied customers who would thus become loyal customers. Additionally, the positive indirect effect of customer satisfaction on customer loyalty through switching cost was found to be nonsignificant. This might be due to the fact that satisfied customers tend not to turn to other service providers until unsatisfactory experiences are encountered.

This study contributes to the modest research involving NOV. We investigated four notable factors for business operations, that is service quality, service satisfaction, switching cost, and customer loyalty, all at one time and specifically for the NVO market, where the lowest-freight rate tactic has been widely used to woo for customers. Our empirical analysis results either confirm results found in literature or are new findings. For example, the positive effect of service quality on customer satisfaction and customer satisfaction on customer loyalty confirm literature research results of [1], [3], [5], [9], [12], [15], and [18]. Furthermore, the result that customer satisfaction has a stronger effect than that of service quality on customer loyalty, is similar to that found in [12], which only repurchase intentions was used to operationalize customer loyalty. The nonsignificant positive relationship between service quality and customer loyalty found in this study is different from that of [5], [12], [17], and [19]. The reasons are that customer loyalty was operationalized by different measurement variables; a significant mediating effect of customer satisfaction on service quality and customer loyalty relationship was found in this study. In terms of the measurement variables for customer loyalty used in this study, price sensitivity, in addition to word-of-communications and repurchase intention as used in [5], [12], [17], and [19], were adopted. Moreover, the positive relationship between switching costs and customer loyalty and the partially supported mediating effect of switching costs on customer

satisfaction and the customer loyalty relationship found in this study contribute to the research results regarding the effect of switching costs on customer loyalty. As indicated in [17], it has been argued that the switching cost will be higher in the service sector than in the manufacturing sector, and the moderating effect of switching costs on the relationship between perceived service quality and preference as well as price indifference loyalty was explored and shown significant, but without direct findings with regard to the positive effect of switching costs on customer loyalty as measured in this study. Finally, a positive relationship between customer satisfaction and switching costs was found in this study, which is a new finding in the literature and for the NVO market. In summary, the results found in this study seem logical; however, further validation based on samples from other NVOs may still be necessary. For example, we found that the respective mean value for the two measurement questions regarding price sensitivity (as stated in the Appendix) was 3 and 2.85, an indication that more samples need to be collected and the influence of service quality, customer satisfaction and switching costs on each separate measurement of customer loyalty adopted in this study need to be further investigated.

Regarding the managerial implications of our findings, the positive influence of service quality on customer satisfaction and customer satisfaction on customer loyalty imply that when good quality of services are provided there is a better chance to satisfy the customer which builds customer loyalty and favors business operations in the international logistics market. The positive effect of customer satisfaction on customer loyalty also implies that customers in the NOV market are more vulnerable to a decrease in satisfaction, which further strengthens the idea that ensuring that customers are satisfied with the services provided is quite essential. The non-significant positive effect of service quality on customer loyalty implies that merely putting effort into improving service quality without examining the significance of customer satisfaction does not necessarily keep customers with the business. The positive effects of customer satisfaction on switching costs, and switching costs on customer loyalty, further strengthen the concept that keeping the customer satisfied is far more important in the international logistics market. In addition, the non-significant indirect effect of customer satisfaction on customer loyalty through switching costs implies that customer satisfaction plays a more important role than does switching costs on customer loyalty in the NVO market. The stronger effect of customer satisfaction on customer loyalty can be realized from

the values of the standardized path coefficients listed in Table 6, where the coefficient value of SA to CL is larger than that of the coefficient value of SC to CL.

Some practical implications regarding the operations of NVOs in Taiwan also can be drawn from the above discussion. Firstly, service quality, customer satisfaction, switching costs, and customer loyalty issues can no longer be neglected by the operational managers of NVOs facing the challenge of the competitive business environments both domestically and internationally. Secondly, the usually employed tactic, the lowest-freight rate, can no longer be assumed to remain effective if sustainable business operations are a goal, since we found that switching costs has a positive influence on customer loyalty in the NVO market of Taiwan. This reminds managers that customers find it easy turn to other service providers due when only the low cost of services is considered. They are usually less loyal to service providers since they are more vulnerable to decrease of switching costs. The third point is that providing good service quality and ensuring that customers are satisfied with the services provided is a must for NVOs seeking a competitive advantage over other NVO.

6 Conclusions and Recommendations

The challenging business environments of ILSPs and the prevailing unhealthy lowest-freight rate tactic now commonly used in the NVO market renders the customer loyalty problem worthy of research attention. The empirical analysis results reported in this study contribute to the literature discussing NVOs as well as to management practices. The theoretical contributions of this study are related to the investigation of the customer loyalty problem in the international logistics market, which has received relatively little attention in the literature. Three critical factors of customer loyalty, service quality, customer satisfaction and switching cost were investigated. Results gleaned from the marketing literature were incorporated together for the first time in this investigation of the customer loyalty problem in the NVO market. The results of an empirical study performed by mail and interview survey of the customers of a specific NVO indicated that the loyalty of NVO customers are directly affected by customer satisfaction and switching costs, as well as indirectly affected by service quality, which can no longer be ignored by the management of NVOs. The outcomes also are comparatively new to the business operations in the NVO market.

Results supporting hypotheses confirm those in literature, except for the new finding, that of the positive effects of customer satisfaction and switching costs on customer loyalty. Managerial implications arising from the research that are beneficial to the operations of NVOs can be summarized as follows: (1) improvement of service quality to ensure customers are satisfied with services provided is relatively more advantageous in retaining customers; (2) customers in the NOV market are more vulnerable to decrease in satisfaction; (3) customers satisfied with the services provided are more loyal to their service provider; and (4) the lowest freight rate tactic, without taking into account the quality of service and customer satisfaction can no longer be the only way to woo customers.

The limitation of this research is that only the customers of an NVO were sampled during data collection for empirical analysis. Nonetheless, the findings of this study are still valuable and provide a valuable contribution since there has been so little research regarding NVOs/international freight forwarders as indicated in [13]. For future research, we suggest that more NVO customers in Taiwan could be surveyed to obtain more information to verify the reported results. The survey could be extended to other countries to collect more general information for study. Finally, other measurement scales or methods, such as fuzzy theory, could also be applied to decrease the variance of measurement results in the questionnaire survey.

Appendix

Construct	First-order factor	Item
Service Quality (SQ)	Professionalism	1. The service networks provided by this firm suit your needs.
		2. Most of the time you are satisfied with the shipping plans proposed by this firm and that it is based on your requests.
		3. The processing speed of S/O for this firm is fast enough to suit your needs.
		4. The cargo tracing capability of this firm is good.
	Reliability	1. This firm shows concern and provides reliable assistance when you encounter difficulty.
		2. The quotation provided by this firm is correct and complete most of the time.
		3. This firm is able to provide timely and promised services.
		4. This firm keeps transaction records and customer data precisely and honestly.
	Responsiveness	1. This firm responds to your requests (e.g., quotation, account checking service and documentation) quickly and precisely.
		2. The service people of this firm always treat you nicely and positively respond to your requests.
	Assurance	1. You feel your interests are insured by doing business with this firm.
		2. It is easy for you to get shipping space from this firm.
3. The documentation provided by this firm is always correct.		
4. The quality of service provided by this firm is consistent.		
5. The service people of this firm collaborate with each other very well while providing services.		
Empathy	1. The service people in this firm always understand your needs.	
	2. This firm offers special services to suit your extraordinary needs.	
	3. The service people of this firm actively care for your needs.	
	4. The service people of this firm always put your benefit as their first priority.	

	Word-of-mouth Communications	<ol style="list-style-type: none"> 1. You would encourage other to use the services of this firm. 2. You would recommend this firm to friends who are looking for such services. 3. You would encourage others to do business with this firm.
Customer Loyalty (CL)	Purchase Intentions	<ol style="list-style-type: none"> 1. You would put this firm as your first priority while doing business. 2. You will do more business with this firm in the near future.
	Price Sensitivity	<ol style="list-style-type: none"> 1. You are willing to stay with this firm even if service prices are raised to a more reasonable level. 2. Given the same service contents, you are willing to stay with this firm even if its rates are more expensive than others.
	Time Cost	<ol style="list-style-type: none"> 1. Looking for other NVOs for service would cost you a lot of time. 2. Building new business relationship with other NVOs would cost you a lot of time. 3. It would require a long time to fit in with the new service contents provided by other NVOs.
Switching Costs (SC)	Monetary Cost	<ol style="list-style-type: none"> 1. It would be difficult for you to gain similar advantageous freight offers if you turn to other NVOs for service. 2. It would be difficult for you to get a similar quality of service for the same freight rates if you turn to other NVOs for service.
	Intangible Cost	<ol style="list-style-type: none"> 1. You consider it to be troublesome for you to turn to other NVOs for service. 2. You consider it to be troublesome for you to build new business relationships with other NVOs. 3. You consider it to be troublesome for you to fit in with the new service contents provided by other NVOs.
Customer Satisfaction (SA)		<ol style="list-style-type: none"> 1. Overall, you are satisfied with the service provided by this firm. 2. The service you received from this firm has exceeded your expectations. 3. The service you have received from this firm is closed to ideal.

Acknowledgement

The financial support from the Taiwan National Science Council, grant number NSC942622E216007, is gratefully acknowledged.

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