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The Moderation Effect of Innovation and Commitment on Customer Service of Port Logistics Firms

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ABSTRACT

This study empirically tests a moderation effect of innovation and commitment on customer service of port logistics firms. There are three variables: innovation, commitment and customer service. The population is port logistics firms and the sample frame is the member lists of Korean International Freight Forwarders Association, Korea Shipowners' Association and Korea Port Logistics Association. A questionnaire is sent to the firms and collected data are tested by Cronbach's alpha coefficient, factor analysis, correlation analysis and moderated regression analysis. The verification of a precondition in the analysis of moderation effect is important but in prior research, researchers overlooked the condition. As a result, the results of the research received low reliability. In this situation, this study tests the precondition by multiple regression analysis and then it also ascertains a moderation effect between variables. As a result of the analysis, the study finds that port logistics firms need to strengthen innovation and commitment not separately but simultaneously for enhancing response to customers and in consequence, they get a synergy effect of two variables.

Keywords: Port logistics firms, Innovation, Commitment, Customer service

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1. Introduction

There are over 80% of GDP in Korea created by international trade and associated industries (Bae and Grant, 2018), and port facilities are necessary for international trade because Korean economy is heavily dependent on international trade, which is performed by maritime transportation. Moreover, port logistics participants include firms which perform works in ports, and they provide shippers with connected logistics services concerned with maritime transportation. When port logistics services are operated very well, delay in port can be minimized. Therefore, port logistics firms are key factors for economic development and growth, and the proper making and maintaining of port facilities are based on developing the port logistics industry.

Ports are regarded as the hub for global supply chain management. A majority of port logistics firms perform their specialized works and carry out collaborative tasks and management. There are many works in port logistics systems such as collection and delivery of goods, warehouse, test, loading/unloading, packing, customs clearance, inland transportation and so on. The works have closely connected with each other, and participants in port logistics processes perform the works through mutual flexible cooperation. They have an aim to provide shippers with high quality of logistics services on the basis of low costs and as a result, they execute commitment among departments and innovation like process improving and work standardization, followed by high quality of customer services. In this regard, this study has need to analyze the effects of commitment and innovation on customer service of port logistics firms.

There are various participants in port logistics processes such as liners, loading/unloading firms, bonded transporters, container terminals, customs brokers, international freight forwarders, bonded warehouses and so on (Bae and Park, 2018). There is still the early stage in research concerned with the influencing factors of port logistics services provided by them. In this regard, prior research are performed as follows. First, research concerned with innovation has been performed from the various viewpoints, and researchers insisted that it makes efficient processes through interaction with resources of firms (Inauen and Schenker-Wicki, 2011; Segarra-Cipres and Bou-Llusar, 2018). Second, research connected with commitment has been fulfilled as various viewpoints in various research fields. For instance, there are three dimensions: one is the definitions of commitment, another is the methods of classifying commitment, and the third is causality between commitment and performance (Allen and Meyer, 1993; Tabrani et al., 2018). Third, research concerned with service performance has been implemented in the viewpoint of the measuring methods (Bask, 2001; Liu and Lee, 2018).

There are two limitations of prior research: one is to study for the

relationship between commitment and performance or the relationship between innovation and performance individually and the other is not to verify interaction effect of commitment and innovation on performance. This means the relations in the viewpoint that one cause can make one result, and as a result, researchers overlooked the aspect of synergy effects between the causal variables. Therefore, the objective of this study is to test the effect of commitment and innovation on customer service of port logistics firms.

2. Literature review

2.1. Resource-based theory and influencing factors of customer service

Resource-based theory is recognized as a complement to a strategic viewpoint of Porter (1980) and it explains that unique resources and capabilities which firms have are regarded as the factors which have an influence on performance. This means that a competitive advantage is started from their resources and capabilities in a corporate level.

According to Barney (1991) and Peteraf (1993), there are two suppositions of resource-based theory concerned with characteristics of resources such as heterogeneity and difficulty to movement of resources. The former explains that firms have discriminative resources and capabilities but these are easily imitated by competitors if these are not heterogeneous. In this situation, it is difficult to keep a competitive advantage of firms. Hence, heterogeneous resources and capabilities should include historical conditions, vague causality and social complexity to enjoy a competitive advantage. The latter is that a competitive advantage could not be kept in firms if resources and capabilities can be moved to competitors in a short period of time even though these are heterogeneous. Therefore, unique resources and capabilities which firms have should be not liquid or be imperfectly moved if these are liquid.

There are various definitions of resources which firms have. According to Barney (1991), it means all things controlled by firms such as assets, capabilities, organizational processes, characteristics, information and intelligence, and it is helpful to make and perform strategies to improve effectiveness and efficiency of firms. In addition, Wenerfelt (1984) defined resources as tangible and intangible assets possessed by firms. Similarly, Amit and Schoemaker (1993) explained it as the storage of useful production factors which firms control. In this regard, the definition of resources is not to mean all things which firms have, but it means the things which acquire competitive advantages and contribute to making a profit in the resources of firms. This is connected with strategic assets (Markides and Williamson, 1996).

Resources should include the characteristics such as useful, rare, imperfectly imitated and non-substitutive, and firms should have the intent of using the resources which have the characteristics (Black and Boal, 1994). The corporate-specific resources are the important factors to decide the competitive advantages among competitors. The competitive advantages are created by corporate-specific resources and as a result, there are gaps in performance among firms. This study will investigate innovation which includes the above four characteristics as corporate resources, and it is divided into work standardization and process improvement.

Innovation means abilities to innovate internal works in whole processes for achieving customer needs (Bowersox et al., 2002). This is concerned with abilities to innovate internal activities of firms to attain customer needs very well in the lowest level of costs. Firms, through the innovation, make possible efficient performance of works and enhance core confidence on the basis of dissemination of the innovation among departments. In addition, firms can create better value because they efficiently respond to customer needs on the basis of staff's behavior on innovation and dissemination in the whole processes.

Commitment is a fundamental factor to successfully attain corporate goals. Staff in firms can make value on achieving their goals through commitment, and the value guarantees successful performance of their strategies and plans. Commitment means intervention on works of staff and responsibility which staff has on the works in firms (Caruana et al., 1997). The staff participates in works through emotional attachment, and as a result, they are immersed in achieving goals of firms. Therefore, commitment is regarded as knowledge-based resources which enhance corporate capabilities.

Commitment as resources of firms could be grasped in three viewpoints: psychological, behavioral and structural (Lin and Hsieh, 2002). The one means expectation, challenge and a collision in an individual mind, the second includes behavior which is not cancelled as well as dependence, and the third represents a sunk cost and a guarantee of staff's status in firms. On the other hand, Allen and Meyer (1993) insisted that commitment is the psychological state of characterizing personal relationships in firms and it could have implications in conformity with behavior for continuing a role as a member in firms. They divided commitment into three categories: emotional, sustainable and normative. Also, according to Lamsa and Savolainen (2000), commitment can be classified into approach to relation and approach to behavior. The former is to focus on relationships of members in firms, and the latter means that an individual is absorbed in various paths of behavior. Both of them are useful to grasp commitment in firms but on the one hand, the former is to focus on relationships of members and on the other hand, the latter is to focus on behavior of an individual. This study focuses on the relationships of participants in port logistics processes because it wants to investigate commitment of port logistics firms.

2.2. Commitment and customer service

Effective commitment can lead organizations to better directions because it has an effect on organizations and their behavior. Prior research divided the relationships between commitment and performance into two viewpoints such as personal and organizational. The former is verified by Boyle (1997) who investigated multi-dimensional viewpoints on commitment of sales persons. The viewpoints are disseminated to the research on organizational commitment of sales persons or staff. The latter is proved by Zeffane (1994) who tested the effect of inter-corporate collaboration on commitment. Liou and Nyhan (1994) found that job security of employees and managing of supervisors have a positive effect on effective and sustainable commitment. In addition, commitment has a positive influence on customer loyalty (Tabrani et al., 2018), knowledge sharing (Yam and Chan, 2015) and customer relationships (Li et al., 2015). Moreover, Rowden (2000) verified the relationship between leadership and organizational commitment. Therefore, port logistics firms have customer oriented work processes and perform strict management by managers and as a result, they have high levels of commitment of staff, followed by high performance.

2.3. Innovation and customer service

Researchers performed prior research concerned with innovation in various viewpoints. Mothe and Thai (2010) proved gaps in performance between a low level of firms and a high level of firms in innovation. Cheng and Chen (2013) found that innovation activities enhance the relationship between active innovation capabilities and development of innovation. Sadik-Rozsnyai (2016) proved that customer culture has a positive effect on intention of innovation. Lofsten (2014) identified that product innovation processes have a positive influence on product innovation performance and sales of firms. Inauen and Sche-Wicki (2011) found that openness in research and development management has a positive effect on innovative products and innovation performance. Segarra-Cipres and Bou-Llusar (2018) proved the positive effect of wide knowledge on innovation of new products, and the positive effect of a deep knowledge on innovation of new services. The viewpoint of innovation in prior research is concerned with innovation for manufacturing firms. Compared with the innovation, innovation of port logistics firms can find the change of customer needs from generated information in the market.

2.4. The moderation effect of innovation and commitment on customer service

Commitment and innovation are confirmed as internal factors of firms to

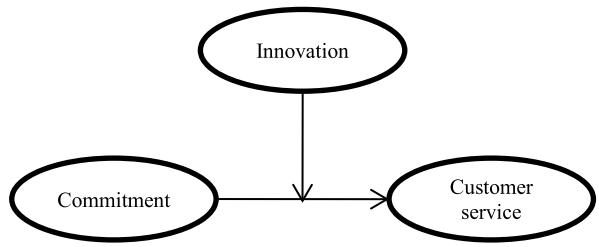
have a direct effect on performance (Stank et al., 1999; Ellinger, 2000). Firms which have a high level of commitment show a high level of performance and in addition, it is affected by innovation. Internal processes of firms are efficiently constructed by them (Caruana et al., 1997). In these viewpoints, innovation carries out an interactive function to enhance the relationship between commitment and performance.

3. Research model and methodology

3.1. Research model

The goal of this research is to test a moderation effect of innovation and commitment on customer service of port logistics firms. To achieve the goal, the model of this research constructed by prior research shows commitment as an independent variable, innovation as a moderated variable and customer service as a dependent variable. This is shown as the research model.

Figure 1. The research model



3.2. Research hypotheses

The relationships between the variables are suggested in literature review. Research hypotheses are as follows.

<H. 1> Work standardization enhances the relationship between commitment and response.
<H. 2> Process improvement enhances the relationship between commitment and response.
<H. 3> Work standardization enhances the relationship between commitment and flexibility.
<H. 4> Process improvement enhances the relationship between commitment and flexibility.

3.3. Definitions and measurement

3.3.1. Conceptual and operational definitions

Commitment means participation, unification and emotional attachment of staffs on firms (Allen, and Meyer, 1993). It can be measured by five items: the degree of happiness on working in your firm (com 1), the degree of discussing with other workers on your firm (com 2), the degree of feeling that the problems of your firm are the same as my problems (com 3), the degree of attachment on my works (com 4) and the degree of thinking companions like family (com 5). All items are measured as seven Likert scale.

Innovation means that the staffs of port logistics firms innovate their internal work processes for achieving customer needs (Bowersox et al., 2002). It can be divided into work standardization and process improvement (Ellinger, 2000; Stank et al., 2001/2002). The former is to make policy or processes among functional areas for promoting works simultaneously and the latter is to check, discuss, perform and improve work processes continuously for the best practice.

Innovation can be measured by ten items: documented work provisions (inn 1), monitoring and supervisions on implementing works following provisions (inn 2), provisions on official collaboration on works (inn 3), a conference for improving provisions on works (inn 4) and performance concerned with carrying out provisions (inn 5) as work standardization and in addition, as concerning with process improvement, declining complexity on works (inn 6), gathering opinion for process improvement (inn 7), achieving goals through process improvement (inn 8), reward on achieving the goals (inn 9) and regular checking and improving of the processes (inn10). All items are measured as seven Likert scale.

Customer service is classified into response and flexibility (Lai et al., 2002; Stank et al., 2001). The former means the degree of meeting to continuous variable customer expectation. In addition, the latter means ability to adapt to unexpected environmental variance. Response is measured as managing port logistics processes with customers (ser 1), ability to accept the special requirement of customers in port logistics processes (ser 2), delivering goods on predicted delivering time (ser 3), consistent response about the requirement of core customers (ser 4) and providing customers with value added service (ser 5). Flexibility is measured as collaborating with partners in port logistics processes (ser 6), responding ability to requirement of customers (ser 7), ability for information sharing with the participants for responding to environmental variance (ser 8), ability for supplying special logistics service such as on-time delivery, quick response and just-in-time (ser 9) and ability to cooperative solution with the partners when there are problems (ser 10). All items are measured as seven Likert scale.

3.3.2. Sampling and methods of data collection

According to the goal of this research, the population of this research is port logistics firms. In addition, there are three sample frames: one is a membership list of Korea Port Logistics Association (305 members), another is a membership list of Korea Shipowners' Association (183 members), and the third is a membership list of Korea International Freight Forwarders Association (760 members). All firms are the object for a survey. The respondent is performed by a staff of management department of the sample firms because they carry out substantial works of port logistics.

The questionnaires were collected by mail, email, telephone, fax and personal visits. The survey was carried out from September 2013 to December 2013 and 179 questionnaires were collected. 175 questionnaires were used in an analysis because four questionnaires have serious problems such as identical answers and omissions.

3.3.3. Methodology

There are used in various analytical methods in this research. First, validity among the variables is tested by factor analysis, Bartlett test and KMO (Kaier-Meyer-Olkin). Second, reliability is verified by Cronbach's alpha coefficient. Third, a moderation effect is analyzed by moderated regression analysis.

A research model of this research is to analyze the moderation effect of innovation and commitment on customer service. The precondition of the analysis is that an independent variable and a moderated variable must have an influence on a dependent variable. In this regard, this research verifies whether commitment and innovation have an influence on customer service and then it ascertains the moderation effect of innovation on the relationship between commitment and customer service. Therefore, the theoretical model of this research is to show the moderation effect of innovation on the relationship between commitment and customer service in Figure 1.

An interaction effect or a moderation effect is tested by moderated regression analysis (Sharma et al., 1981). In other words, moderated regression analysis is the best methodology for testing whether innovation has a moderation effect or a quasi-moderation effect on the relationship between commitment and customer service.

The equation models of moderated regression analysis are as follows. Researchers should compare with three regression equation models in moderated regression models. Model I: $y = a + bx + \varepsilon$, Model II: $y = a + bx + cz + \varepsilon$ and Model III: $y = a + bx + cz + dxz + \varepsilon$. In the regression model, y is dependent variable (customer service), x is independent variable (commitment), z is moderated variable (innovation) and xz is additional variable (commitment * innovation).

Research on a moderation effect is to test moderation effects of moderated variables between independent variables and dependent variables. According to the precondition, commitment is an independent variable, innovation is a moderated variable and the variable which is composed of commitment and innovation is an additional variable. This research should verify whether the additional variable has a moderation effect or a quasi-moderation effect on the relationship between independent variables and dependent variables. The methods are as follows: there are three models and researchers should compare model II with model III. Adj R^2 of model III should be higher than adj R^2 of model II, and in addition, d is not 0 (zero) if innovation as a moderated variable has a moderation effect on the relationship between commitment and customer service. In this case, it is a pure moderated variable if c is 0 (zero) and the variable has a quasi-moderation effect even if c is not 0 (zero). There are no a moderation effect if adj R^2 of model III is lower than adj R^2 of model II and d shows 0 (zero).

4. The results of empirical test

4.1. General characteristics of the responding firms

A survey was performed to port logistics firms which are the object of the research and 112 data is used in an analysis. Classification by business of sample firms is as follows.

Table 1. Classification by business of the responding firms

Classification by business	frequency	Ratio (%)	Annual turnover (U$, million)	frequency	Ratio (%)
Forwarders	122	69.7	Below 0.5	71	40.6
Liners	21	12.0	0.5–1.0	30	17.1
Loading/unloading	7	4.0	1–5	8	4.6
Others	7	4.0	Over 5	2	1.1
No answer	18	10.3	No answer	64	36.6
Total	175	100.0	Total	175	100.0
Year of foundation	frequency	Ratio (%)	The number of employees	frequency	Ratio (%)
Before 2000	77	44.0	Less than 10	73	41.7
2001–2010	54	30.9	11–30	45	25.7
2011–2013	12	6.9	More than 31	20	11.4
No answer	32	18.2	No answer	37	21.2
Total	175	100.0	Total	175	100.0

Classification by business of the responding firms is a criterion to confirm whether the sample reflects the population. As shown in Table 1, forwarders in the responding firms are 122 firms (69.7%) which are the largest figure. Loading and unloading firms are seven firms (4.0%) which are the smallest figure. Similarly, others are seven firms (4.0%) and they are regarded as firms which carry out works concerned with port logistics such as bonded transportation brokers, bonded warehouse, customs brokers, inspection firms and packing firms. The results of annual turnover are similar with the classification of business. This means that 71 firms are below 0.5 million and they are almost included in forwarders. 64 firms include in no answer and this means that they treat it as strictly confidential. 77 firms are founded before 2000 and just 12 firms are founded after 2010. 73 firms are shown in less than 10 in the number of employees and almost all of them are also included in forwarders. The results of descriptive statistics show that the sample reflects the population. The result of correlation analysis between the variables is shown in Table 2.

Table 2. The result of correlation analysis among variables

Division	average	S.D.	wor	pro	com	res	fle
wor	4.257	1.596	1.000				
pro	4.490	1.451	0.740**	1.000			
com	5.513	1.369	0.199**	0.453**	1.000		
res	4.936	1.260	0.416**	0.643**	0.613**	1.000	
fle	5.111	1.244	0.340**	0.572**	0.794**	0.760**	1.000

** $p < 0.01$, wor: work standardization, pro: process improvement, com: commitment, res: response, fle: flexibility

There are two objectives in correlation analysis. The first, high correlation between independent variables can be doubted about multicollinearity. In this situation, the relationship between independent variables is regarded as mutual independence if MAX-VIF is below 10.0 and tolerance is over 0.1. The second, the analysis can ascertain the relationship between independent and dependent variables. The high relationship between independent and dependent variables means that independent variables explain dependent variables very well. As shown in Table 2, the relationships between the variables show highly and the coefficients are significant in 1%. The result of multicollnearity is that process improvement has 0.389 in tolerance and 2.571 in MAX-VIF, commitment has 0.705 in tolerance and 1.307 in MAX-VIF and work standardization has 0.469 in tolerance and 2.133 in MAX-VIF. Therefore, there are no problems in multicollinearity.

4.2. Reliability and validity analyses

Before testing research hypotheses, this research analyzes reliability and validity on measuring items. Reliability means a possibility to present the same measuring coefficient when the same concepts are repeatedly tested. Validity means that measuring items reflect a specific concept or characteristic of a variable. Reliability is tested by a Cronbach's alpha coefficient and validity is verified by factor analysis. In addition, Bartlett test and KMO are tested in this research. Criteria are as follows: over 0.6 in Cronbach's alpha coefficient; over 0.5 in a factor loading coefficient; over 1.0 in eigenvalue; significant in p-value in Bartlett test; over 0.5 in KMO. The results of the analysis are to show in Table 3.

Table 3. The result of reliability and validity on innovation and commitment

Items	Factor loading	Cronbach's alpha	Eigenvalue	Percentage of variance	Bartlett & KMO
inn 1 inn 2 inn 3	0.859 0.597 0.664	0.850	1.947	12.983	Bartlett test Chi-square= 2551.705 df=105 p=0.000 KMO= 0.917
inn 6 inn 7 inn 8 inn 9 inn10	0.769 0.809 0.825 0.805 0.882	0.927	5.696	37.970	
com 1 com 2 com 3 com 4 com 5	0.884 0.928 0.881 0.921 0.796	0.947	4.344	28.960	

Table 4. The result of reliability and validity analyses on customer service

Items	Factor loading	Cronbach's alpha	Eigenvalue	Percentage of variance	Bartlett & KMO
ser 1 ser 2 ser 3 ser 4 ser 5	0.858 0.745 0.812 0.793 0.693	0.920	3.762	37.619	Bartlett test Chi-square= 1546.651 df=45 p=0.000 KMO= 0.930
ser 6 ser 7 ser 8 ser 9 ser10	0.832 0.861 0.677 0.802 0.866	0.935	4.060	40.601	

As shown in Table 3, innovation has two sub-variables: work standardization and process improvement. The former has three measuring items. There are no problems in the results of reliability and validity. The latter has five measuring items. There are no problems in the results of reliability and validity. Commitment has five measuring items. The results are shown over the criteria. Therefore, the results of reliability and validity on independent variables are no problems. Next are reliability and validity on dependent variables.

As shown in Table 4, customer service has two sub-variables: flexibility and response. The former has five measuring items. There are no problems in the result. The latter has five measuring items. There are no problems in the results. This means that there are no problems in the results of reliability and validity of independent variables and dependent variables.

4.3. Hypotheses test

To achieve the objective of this research, this research ascertains the moderation effect of innovation and commitment on customer service. The results of the analyses are as follows.

Table 5. The moderation effects of innovation and commitment on response

Variables	Model I	Model II	Model III	Model IV	Model V	Model VI
constant	14.255***	3.452***	−1.701*	10.180***	3.827***	−0.278
Work Standardization (A)	6.025***	5.389***	4.042***			
Commitment (B)		9.696***	6.007***		6.999***	4.308***
A*B			−3.043***			
Process improvement (C)				11.054***	7.972***	3.697***
B*C						−1.784*
R^2	0.173	0.466	0.493	0.414	0.544	0.552
adj R^2	0.169	0.459	0.484	0.411	0.539	0.544

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

As shown in Table 5, work standardization enhances the relationship between commitment and response because model III is bigger than model I and model II compared on the basis of adj R^2 (H.1 supported). In addition, process improvement enhances the relationship between commitment and response because compared with adj R^2, model VI is bigger than model IV and model V (H.2 supported). Therefore, innovation enhances the relationship between commitment and response.

Table 6. Moderation effects of innovation on the relationship between commitment and flexibility

Variables	Model I	Model II	Model III	Model IV	Model V	Model VI
constant	15.719***	2.759***	−0.020	11.532***	3.045***	0.544
Work Standardization (A)	4.762***	4.214***	1.776*			
Commitment (B)		16.817***	6.217***		14.098***	5.840***
A*B			−0.992			
Process Improvement (C)				9.177***	5.598***	1.931*
B*C						−0.579
R^2	0.116	0.666	0.668	0.327	0.688	0.689
adj R^2	0.111	0.662	0.662	0.324	0.684	0.683

*** p < 0.01, ** p < 0.05, * p < 0.1

As shown in Table 6, innovation does not enhance the relationship between commitment and flexibility (H.3 and H.4 rejected). According to the criteria of moderated regression analysis, there are two criteria; one is that an additional variable is significant to a dependent variable and the other is that adj R^2 of model II is bigger than adj R^2 of model I and model II. However, the results of <Table 6> are not satisfied to the criteria. This means that innovation has no moderation effect on the relationship between commitment and flexibility.

5. Conclusion

The objective of this study is to verify the moderation effect of innovation and commitment on customer service of port logistics firms. This study ascertains the relationship between the variables through prior research and suggests conceptual and operational definitions. In addition, a questionnaire is sent to port logistics firms for a survey and collected data is used in analyses.

The theoretical implication of the result is as follows. Innovation enhances the relationship between commitment and response. This means that port logistics firms need to strengthen commitment and innovation like work standardization and process improvement not separately but simultaneously for enhancing response to customers and in consequence, they can acquire a synergy effect of the two variables. Therefore, they can perform a higher level of response when they connect innovation with commitment.

The managerial implications of the result are as follows. First, process improvement for removing overlaps and inefficiencies of port logistics firms can

structure efficient internal processes through construction of collaborative attitude and information sharing among departments and then they can cultivate ability for enhancing the relationship with customers, responding to expectation of customers, cooperating with customers and actively coping with environmental variance. Therefore, they manage port logistics processes with customers through process improvement, accept customers' special requesting, provide goods for customers in predicted date, respond to core customers' requirement consistently and provide value added service when customers request.

Second, when port logistics firms have a high collaborative level, they can increase a level of commitment of staffs through removing overlaps and inefficiencies of work processes in the internal viewpoint of firms and in addition, they can enhance a level of commitment on works of staffs through quick recognition on customer needs and improvement of the relationship between firms. Therefore, port logistics firms which have a high level of commitment can provide customers with a high level of response.

Third, port logistics firms can answer very well with continuous changing expectation of customers as well as enhancing participation, unification and attachment of staffs on their works when they make processes and policy among functions for promoting simultaneous works.

The limitations of this research are as follows. First, there are many methods to test moderation effects. This study used moderated regression analysis but structural equation modeling and multivariate regression analysis with cluster analysis are also useful methods to test moderation effects. These kinds of methods can be used for testing the relationship between variables in the future research.

Second, the moderation effect of innovation and commitment on flexibility is not supported. Prior research already ascertained the moderation effect but this study has different results. Therefore, researchers need to test the relationship between the variables. The limitations consist of future research directions.

References

Allen, N. J. and Meyer, J. P. (1993), "Organizational Commitment: Evidence of Career Stage Effects?", *Journal of Business Research*, Vol. 26, No.1, pp.49-61.

Amit, R. and Schoemaker, P.J. (1993), "Strategic Asserts and Organizational Rent", *Strategic Management Journal*, Vol. 14, pp. 33-46.

Bae, H.S. and Grant, D.B. (2018), "Investigating Effects of Organizational Culture and Learning on Environmental Collaboration and Performance of Korean Exporting Firms", *International Journal of Logistics: Research and Applications*, Vol. 21, No. 6, pp. 614-630.

Bae, H.S. and Park, D.J. (2018), "Gaps in Performance between Levels of Inter-corporate Relationships in Port Logistics Processes", *The Asian Journal of Shipping and Logistics*, Vol. 34, No. 3, pp. 209-217.

Barney, J. (1991), "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, Vol. 17, No. 1, pp. 99-120.

Bask, A. H. (2001), "Relationships among TPL Providers and Members of Supply Chains - a Strategic Perspective", *Journal of Business and Industrial Marketing*, Vol. 16, No. 6, pp. 470-486.

Black, J.A. and Boal, K.B. (1994), "Strategic Resources: Traits, Configurations and Paths to Sustainable Competitive Advantage", *Strategic Management Journal*, Vol. 15, (summer), pp. 131-148.

Boyle, B.A. (1997), "A Multi-dimensional Perspective on Salesperson Commitment", *Journal of Business and Industrial Marketing*, Vol. 12, No. 6, pp. 354-367.

Bowersox, D. J., Closs, D. J. and Cooper, M. B. (2002), *Supply Chain Logistics Management*, McGrow Hill.

Caruana, A., Ramaseahan, B. and Ewing, M. T. (1997), "Market Orientation and Organizational Commitment in the Australian Public Sector", *International Journal of Public Sector Management*, Vol.10, No.4, pp.294-303.

Cheng, C.C.J. and Chen, J.-S. (2013), "Breakthrough Innovation: The Roles of Dynamic Innovation Capabilities and Open Innovation", *Journal of Business & Industrial Marketing*, Vol. 28, No. 5, pp. 444-454.

Ellinger, A. E. (2000), "Improving Marketing/Logistics Cross-functional Collaboration in the Supply Chain", *Industrial Marketing Management*, Vol.29, pp.85-96.

Ellinger, A. E, Daugherty, P. J. and Keller, S. B. (2000), "The Relationship Marketing/Logistics Interdepartmental Integration and Performance in US Manufacturing Firms: An Empirical Study", *Journal of Business Logistics*, Vol.21, No.1, pp.1-22.

Inauen, M. and Schenker-Wicki, A. (2011), "The Impact of Outside0in Open Innovation on Innovation Performance", *European Journal of Innovation Management*, Vol.

14, No. 4, pp. 496-520.

Lai, K., Ngai, E.W.T. and Cheng, T.C.E. (2002), "Measures for Evaluating Supply Chain Performance in Transport Logistics", *Transportation Research Part E*, (April), pp, 439-456.

Lamsa, A. and Savolainen, T. (2000), "The Nature of Managerial Commitment to Strategic Change", *Leadership and Organization Development Journal*, Vol.21, No.6, pp.297-306.

Li, Y., Li, G. and Feng, T. (2015), "Effects of Suppliers' Trust and Commitment on Customer Involvement", *Industrial management & Data Systems*, Vol. 115, No. 6, pp. 1041-1066.

Lin, S.L. and Hsieh, A.T. (2002), "Constraints of Task Identify on Organizational Commitment", *International Journal of Manpower*, Vol. 23, No. 2, pp. 151-165.

Liou, K. T. and Nyhan, R. C. (1994), "Dimensions of Organizational Commitment in the Public Sector: an Empirical Assessment", *Public Administration Quarterly*, Vol.18, No.1, pp.99-118.

Liu, C.-L. and Lee, M.-Y. (2018), "Integration, Supply Chain Resilience, and Service Performance in Third-party Logistics Providers", *The International Journal of Logistics Management*, Vol. 29, No. 1, pp. 5-21.

Lofsten, H. (2014), "Product Innovation Processes and the Trade-off between Product Innovation Performance and Business Performance", *European Journal of Innovation Management*, Vol. 17, No. 1, pp. 61-84.

Markides, C.C. and Williamson, P.J. (1996), "Corporate Diversification and Organizational Structure: A Resource-based View", *The Academy of Management Journal*, Vol. 39, No. 2, pp. 340-367.

Mothe, C. and Thi, T.U.N. (2010), "The Link between Non-technological Innovations and Technological Innovation", *European Journal of Innovation Management*, Vol. 13, No. 3, pp. 313-332.

Peteraf, M. (1993), "The Cornerstones of Competitive Advantage: A Resource-based View", *Strategic Management Journal*, Vol. 14, No. 3, pp. 179-191.

Porter, M. (1980), *Competitive Strategy*, New York, Free Press.

Rowden, R.W. (2000), "The Relationship between Charismatic Leadership Behaviors and Organizational Commitment", *Leadership & Organization Development Journal*, Vol. 21, No. 1, pp. 30-35.

Sadik-Rozsnyai, O. (2016), "Willingness to pay for Innovations: An Emerging European Innovation Adoption Behaviour", *European Journal of Innovation Management*, Vol. 19, No. 4, pp. 568-588.

Segarra-Cipres, M. and Bou-Llusar, J.C. (2018), "External Knowledge Search for Innovation: The Role of Firms' Innovation Strategy and Industry Context", *Journal of Knowledge Management*, Vol. 22, No. 2, pp. 280-298.

Sharma, S., Durand, R. M. and Gur-Aire, O. (1981), "Identification and Analysis of

Moderator Variables", *Journal of Marketing Research*, (August), pp.291-300.

Stank, T. P., Daugherty, P. J. and Ellinger, A. E. (1999), "Marketing/Logistics Integration and Firm Performance", *The Journal of Logistics Management*, Vol.10, No.1, pp11-24.

Stank, T. P., Keller, S. B. and Closs, D. J. (2001/2002), "Performance Benefits of Supply Chain Logistical Integration", *Transportation Journal*, Vol.41, No.2/3, pp.32-46.

Stank, T.P., Keller, S.B. and Daugherty, P.J. (2001), "Supply Chain Collaboration and Logistical Service Performance", *Journal of Business Logistics*, Vol. 22, No, 1, pp. 29-48.

Tabrani, M., Amin, M. and Nizam, A. (2018), "Trust, Commitment, Customer Intimacy and Customer Loyalty in Islamic Banking Relationships", *International Journal of Bank Marketing*, Vol. 36, No. 5, pp. 823-848.

Wernerfelt, B. (1984), "A Resource-based View of the Firm", *Strategic Management Journal*, Vol. 5, pp. 171-180.

Yam, R.C.M. and Chan, C. (2015), "Knowledge Sharing, Commitment and Opportunism in New Product Development", *International Journal of Operations and Production Management*, Vol. 35, No. 7, pp. 1056-1074.

Zeffane, R. (1994), "Patterns of Organizational Commitment and Perceived Management Style: a Comparison of Public and Private Sector Employees", *Human Relations*, Vol.47, (August), pp.977-1010.