

# Innovative Logistics Service Capability: Its Impact on Competitiveness and Performance

Darjat Sudrajat<sup>1</sup>, Dyah Budiastuti<sup>2</sup>, Engkos Achmad Kuncoro<sup>3</sup>, Nugroho J. Setiadi<sup>4</sup>

<sup>1,2,3,4</sup>*BINUS Business School, Bina Nusantara University, Jakarta-Indonesia*

<sup>1</sup>darjat.sudrajat@binus.edu

<sup>2</sup>eak@binus.edu

<sup>3</sup>dbudiastuti@binus.edu

<sup>4</sup>nugroho.setiadi@binus.edu

**Abstract**— Nowadays, Indonesian Logistics Service Providers (LSP) need to improve their performance to enable them competing with foreign logistics service providers with particular reference to cope with the ASEAN Economic Community (AEC). The main purpose of this research is to investigate the impact of innovative logistics service capability (INOV) on LSP's performance (PERFORM) and competitiveness (COMP). The research model was developed based on previous theories and researches. This research constituted a causal research. It used questionnaires in collecting data from respondents by applying probability sampling with sample size consist of 280 logistics service providers (LSP) in Jakarta-Indonesia (Jabodetabek Region). The model was examined through structural equation modeling (LISREL). In the research was also conducted investigation about role of LSP's competitiveness (COMP) in mediating the effect of innovative logistics service capability (INOV) on firm performance (PERFORM). The results of research contributed to innovative capability concept as part of dynamic capabilities particularly in logistics service. In addition, the study verified the relationships among firm's capabilities, competitiveness and performance.

**Keywords**— *Competitiveness, Innovative logistics service capability, performance, innovation, logistics service provider,*

## 1. Introduction

Indonesia's current logistics performance is one of the most urgent issues to be improved by government. It is reflected by logistics performance index (LPI-2018) that positioned Indonesia in the 46<sup>th</sup> rank of 160 surveyed countries [1]. The position is still below from Singapore, Thailand, and Malaysia. The logistics performance index is a measure of a country's logistics performance assessed from some aspects, namely customs, infrastructure, international shipment, logistics competency, tracking and tracing, and timeliness

Based on government's blueprint of logistics regulation, one of key drivers to improve the condition is logistics service industry [2]. They are various types of companies that provide both partial and integrated logistics services [3]. In 2014, according to the Association (ALFI) there were 4,234 members in the industry, but about 50% were active, while 50% were inactive. They have poor performance so that they cannot compete with other companies particularly foreign companies.

Theoretically, some researchers stated that innovative capabilities had effect on firm competitiveness [4,5,6] and firm performance [8,9,10]. The firm competitiveness had effect on firm performance [11,12,13]. The firm performance had effect on firm competitiveness [14,15,16]. The previous researches examined only relationships between two variables of the three variables. In this research, therefore, was set a model encompass the relationships of the three variables namely innovative logistics service capability, firm competitiveness and firm performance. Conceptually, the firm performance mediated effect of innovative logistics service capability on firm competitiveness [17]. The main objective of the research is to examine the impact of innovative logistics service capability on firm's competitiveness and performance. Besides verifying the competitiveness as mediator variable for effect of innovative logistics service capability on firm performance. Therefore, the research problem is "does innovative logistics service capabilities has an impact on firm's competitiveness and performance? does the firm competitiveness mediate effect of innovative logistics service capability on the firm performance?"

## 2. Literature Review

Strategic management is the full set of commitment, decisions, and actions required for a corporation to achieve strategic competitiveness and performance [18,19]. It was used as grand theory to approach the research problem. One

of strategic management perspectives is dynamic capabilities perspective. It is a model that emphasizes a firm's ability to modify and leverage its resource base in a way that enables it to gain and sustain competitive advantage in a constantly changing environment [20]. It comprises innovative, absorptive, and adaptive capabilities [21].

Innovation is a critical element for corporations to achieve excellence performance and competitiveness [22, 23]. Capabilities relate to capacities or skills to orchestrate set of resources and deploy them in an integrative and strategic manners [22,23]. Managing innovation is about building a dynamic capability [24]. Innovative capability is a corporation's ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviors and processes. Innovative logistics service capabilities refer to LSP's capabilities in developing innovative new services and/or markets logistics service. The innovative logistics service capability dimensions consist of sensing capability, combination capability, and relational capability. Sensing capability is ability to monitor opportunities in the logistics service market. Combination capability is ability to combine existing logistics service knowledges. Relational capability is ability to establish relationships with external parties (shipping lines, airlines, truckers, warehousing companies, etc.).

Competitiveness constitute company's ability to use innovative and productive resources and capabilities to increase output, maintain and gain market share, offer goods and services, respond and win competition, and create customer value [25,26]. The competitiveness indicates a company's ability to design, produce and market a product better than its competitors. It can be evaluated through several factors such as price, quality, and technology [26,27]. Sources of competitiveness comprise assets, performance, and processes [26,27]. In this research, competitiveness is defined as ability of logistics service companies in using resources to support competition and create value for customers. The dimensions of competitiveness consist of financial strength, customer value, and skills.

Performance is the efficiency and/or effectiveness of an action [28]. Effectiveness is the extent to which the result of an action meets our expectations, requirements, or specifications. Efficiency is the amount of resources the action consumes to deliver the result or output. A performance measure, indicator or metric is the qualitative or quantitative assessment of the efficiency and/or the effectiveness of an action.

Performance is what an enterprise delivers to its stakeholders in financial and operational terms, evaluated through such measures as net operating profit, return on capital employed, total returns to shareholders, net operating costs, and stock turn [29]. Profitability and growth are two dimensions of company's performance that are often used in researches [30]. According to Mithas, Ramasubbu & Sambamurthy [31], the company's performance is a multidimensional construct encompasses four elements, namely customer-focus, market and financial, human resources, and organizational effectiveness. In this research, firm performance is defined as a measure that shows how

well logistics service companies can achieve their goals within certain time period. The performance dimensions comprise financial, customer, and operational perspectives.

According to [5,6], the innovative capabilities had a positive effect on competitiveness. Meanwhile, capability had a positive effect on competitiveness but it was not significant [5]. Organizational capabilities had a positive and significant impact on competitiveness. Based on these studies, innovative capabilities had positive effect on firm competitiveness, but its significance required further verification (inconsistency) [6]. Conceptually, innovation capability affected firm performance. Innovative capabilities had a positive effect on firm performance but it was not significant [32]. According to [33], conceptually organizational capability had effect on firm performance. Innovative capabilities had effect on the firm performance [34]. Based on the previous researches, innovative capabilities had effect on the firm performance, while its significance needed further verification. Firm competitiveness had effect on firm performance [13, 35].

### 3. Research Method

The research used causal-explanatory method. It explained relationships among variables [36,37]. It was used to test the causality relationship between variables that have been built based on theory, whether or not the model can be confirmed with the empirical data. This research's analysis unit was organization and observation unit was company's leader. Data were collected using questionnaire (Likert scale) and probability sampling (simple random sampling). The sample size consisted of 280 respondents constituted logistics service companies registered as members of Association (ILFA) in Jakarta (Jabodetabek) Region. The data were processed by SEM-LISREL program.

The research consisted of three latent variables namely Innovative Logistics Service Capability (I or INOV), Firm Competitiveness (C or COMP), Firm Performance (P or PERFORM). The innovative logistics service capability (INOV) had 3 dimensions and 14 indicators, the firm competitiveness (COMP) had 3 dimensions and 9 indicators, and the firm performance (PERFORM) had 3 dimensions and 9 indicators.

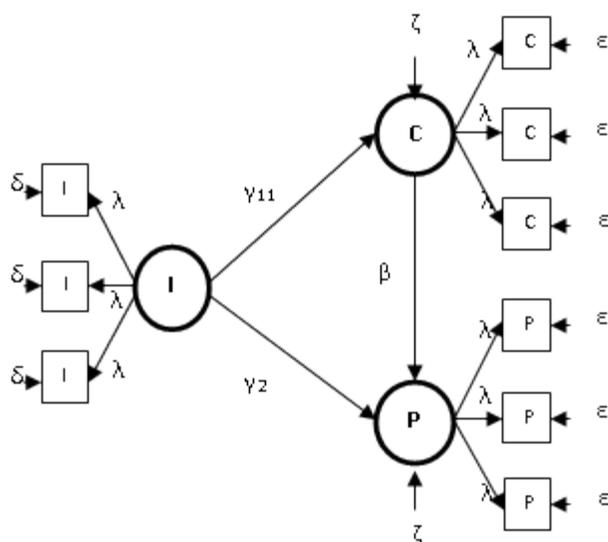


Figure 1. Research Hybrid Model

### Hypothesis:

#### Direct Effects:

Ho : INOV has not positive and significant effect on COMP and PERFORM. COMP has not positive and significant effect on PERFORM.

Ha : INOV has positive and significant effect on COMP and PERFORM. COMP has positive and significant effect on PERFORM.

#### Mediation Effect:

Ho :  $z\text{-value} \leq 1.96$  ( $\alpha = 0.05$ ); Firm competitiveness does not has mediation effect on relation between innovative logistics service capability and LSP's performance

Ha :  $z\text{-value} > 1.96$  ( $\alpha = 0.05$ ); Firm competitiveness has mediation effect on relation between innovative logistics service capability and LSP's performance

In the data preparation, there were three tests namely normality, multicollinearity, and heteroscedasticity tests. The result of normality test, the research's data did not have multivariate normal distribution ( $z\text{-score} = 82.7 > 1.96$ ). Based on multicollinearity test, there was not exist multicollinearity in the data ( $VIF < 10$ ). The result of heteroscedasticity, there was not heteroscedasticity in the regression model ( $p\text{-value} > 0.05$ ).

Whereas in the model preparation was conducted three steps namely specification, identification, and estimation. In the specification step, it was defined the latent variables (exogenous and endogenous) and observed variables, measurement error, and structural error. The result of the specification step was research hybrid model as in figure 1. The output of identification step referred to the status of the model, namely over-identified model because it had a positive degree of freedom. The result of the estimation step referred to the estimator used in the data processing, namely the

Satorra-Bentler Method (Robust Maximum Likelihood) because the data did not have normal distribution so that it constituted a suitable estimator. It comprehended with the result of the normality test.

The research used some goodness of fit index (GOFI) to examine the data fitness with its model namely RMSEA, NFI, NNFI, CFI, IFI, RFI, Std. RMR, GFI and AGFI. The standards of GOFI namely  $RMSEA \leq 0.08$ ,  $NFI \geq 0.90$ ,  $NNFI \geq 0.90$ ,  $CFI \geq 0.90$ ,  $IFI \geq 0.90$ ,  $RFI \geq 0.90$ ,  $Std. RMR \leq 0.08$ ,  $GFI \geq 0.90$  and  $AGFI \geq 0.90$ .

## 4. Results and Discussion

There were three tests for the model fit that conducted in the research namely overall model fit, measurement model fit, and structural model fit. The results of the tests that were the models had good GOFIs. It meant that between data and model had good fitness. The results were based on the majority of goodness of fit index met the required criteria. The tests resulted equations as follows:

Measurement Model Equations of Exogenous Latent Variables:

- $I_1 = 0.94 I + 0.11$
- $I_2 = 0.71 I + 0.49$
- $I_3 = 0.74 I + 0.45$

Measurement Model Equations of Endogenous Latent Variables:

- $C_1 = 0.88 C + 0.23$
- $C_2 = 0.59 C + 0.65$
- $C_3 = 0.75 C + 0.43$
- $P_1 = 0.91 P + 0.17$
- $P_2 = 0.78 P + 0.39$
- $P_3 = 0.33 P + 0.89$

Structural Model Equations

- $C = 0.79 I + 0.34; R^2 = 0.62$
- $P = 0.16 C + 0.55 I + 0.33; R^2 = 0.44$

Based on the equations, innovative logistics service capability (INOV) had positive and significant effect on firm competitiveness (COMP) and performance (PERFORM). Firm competitiveness (COMP) had positive effect on firm performance (PERFORM) but was not significant. Based on the  $R^2$  score, the innovative logistics service capability (INOV) had effect 66% on firm competitiveness (COMP), whereas the rest or 34% affected by other factors that were not researched. The firm competitiveness (COMP) and innovative logistics service capability (INOV) simultaneously had effect 46% on firm performance (PERFORM), whereas the rest or 54% was affected by other factors that were not researched.

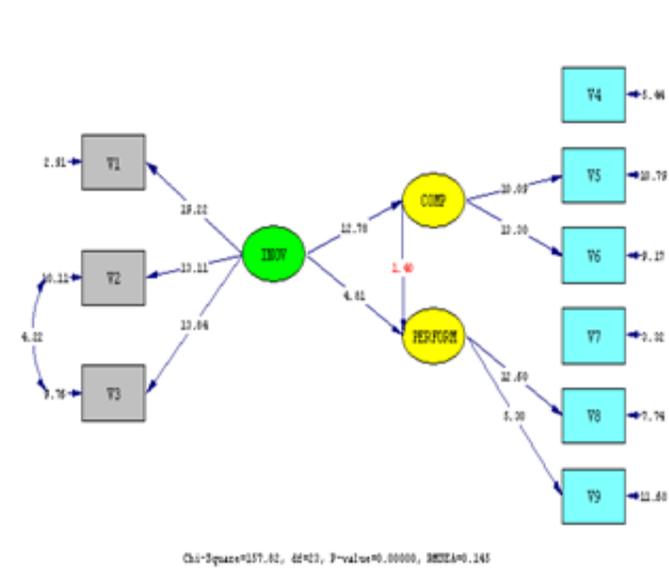
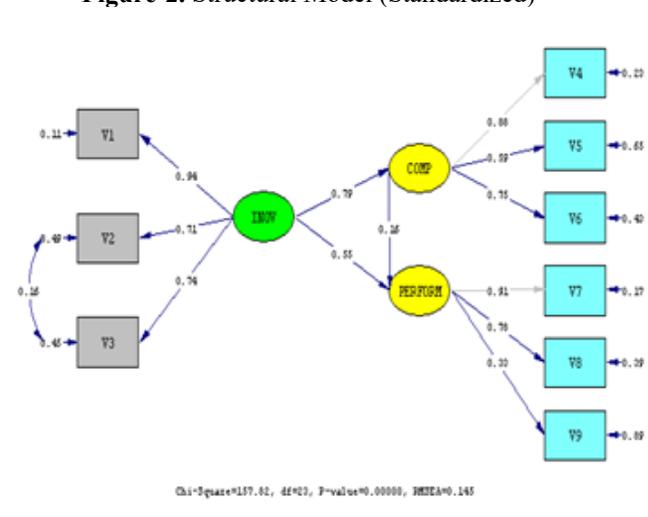
The effect coefficients among the latent variables showed as in figure-2 and figure-3. Based on the figures, the indirect effect = 0.12 ( $0.79 \times 0.15$ ), the direct effect = 0.55, INOV to COMP was significant (0.55) but COMP to

PERFORM was not significant (0.16), and  $z$ -value = 1.4 ( $z$ -value < 1.96). Therefore, there was non-mediation occurs (Ho was accepted). It meant that the firm competitiveness (COMP) was not mediate the effect of innovative logistics service capability (INOV) on firm performance (PERFORM). In other words, the firm competitiveness (COMP) cannot be a mediator variable in relation between innovative logistics service capability (INOV) and firm performance (PERFORM). Capability in analyzing customers' products constituted the main indicator of innovative logistics service capability (INOV); whereas financial perspective was the main indicator of firm competitiveness (COMP); and financial strength was the main indicator of firm performance (PERFORM).

The logistics services providers in Indonesia should enhance their innovative logistics service capability particularly in the term of capability in analyzing customer's product so that they can enhance their competitiveness and performance. Generally, each customer has unique logistics operations pattern. One of the factors determined the uniqueness is product characteristic. Different types of products require different logistics operations. So, the more understanding of the customer's products, the more innovative logistics services that can be offered by logistics service providers. Regarding financial perspectives, there are three important aspects for logistics service providers consist of working capital, liquidity, and financial report. Strong working capital constitute one of customer's considerations in choosing their third party logistics, so it will be able to strengthen the LSP's competitiveness. Adequate liquidity will be able to guarantee logistics service providers (LSP) pay their short-term debts to suppliers and will even be able to conduct advance payment in the form of partial or total payment, so they get a competitive rate from suppliers (shipping lines, airlines, trucking, warehousing, etc.). Whereas a complete and audited financial report by an external auditor usually becomes an administrative requirement for logistics service providers (LSP) in submitting an application to become companys' third party logistics. Financial performance is one of important aspects for LSPs, it encompasses gross profit, net profit and growth; if the three performance indicators are good then the overall LSP's performance will be good too.

The effect of innovative logistics service capability on firm competitiveness was higher than its effect on firm performance. The research did not examine the firm performance as mediator variable relationship between innovative logistics service capability and competitiveness therefore it could not compare both relationships model. It constituted the main limitation of the research that could be a gap for further research.

**Figure-2.** Structural Model (Standardized)



**Figure-3.** Structural Model (t-value)

## 5. Conclusion

The results of this research showed that the research model had good fit with the data for all model namely overall model, measurement model and structural model. The innovative logistics service capability (INOV) directly had positive and significant effect on firm competitiveness (COMP). The innovative logistics service capability (INOV) directly had positive and significant effect on firm performance (PERFORM). The firm competitiveness (COMP) directly had insignificant effect on firm performance (PERFORM). It meant that INOV had very important role to enhance COMP and PERFORM but COMP could not be mediator between INOV and PERFORM. For further research, it need be examined PERFORM as mediator between INOV and COMP.

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