

## Enhancing Logistics Performance through Organizational Factors: An Empirical Investigation of Automotive Spare Parts Manufacturers in Thailand's Eastern Economic Corridor

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**Abstract.** This study investigates the impact of organizational factors on logistics performance and efficiency among automotive spare parts manufacturers in Eastern Economic Corridor (EEC) of Thailand. A quantitative approach is employed using structural equation modeling (SEM) to analyze data collected from 301 manufacturers through a questionnaire survey. The findings reveal that policy and operational excellence are the strongest indicators of organizational factors, while investment has weaker association. The study highlights the importance of considering organization factors in improving logistics performance and efficiency in the automotive spare parts industry. However, the research is limited by its focus on a specific region and the use of a single data collection method. Future studies should explore the generalizability of the findings to other contexts and employ multiple methods to triangulate the results. Despite these limitations, the study contributes to the understanding of the complex relationships between organizational factors, logistics performance, and efficiency, providing valuable insights for practitioners and policymakers in the automotive industry.

**Keywords:** Organization factors, Logistic performance, Automotive Spare Parts Industry.

## 1. Introduction

Automotive industry in Thailand plays an important role for Thai economic development. Thai automotive industry had a total revenue of \$71.5 billion in 2022, representing a compound annual growth rate (CAGR) of 6.1% over 2017 – 2022 (Nattapan & Noah, 2022). It is also integrated into regional and global value chain. The industry produced around 2 million vehicles in 2019 and exported them to Australia, Indonesia and Malaysia, while automotive parts were exported to Japan, Indonesia, and Malaysia. (Patarapong, 2021). However, the trend of global automotive industry is changing. Digital technologies and globalization play important roles in this evolution; global carmakers and automotive spare part manufacturers are taking note of this evolution and investing heavily in these changing. (Fraga-Lamas & Fernández-Caramés, 2019). Randall Miller (2019) explains that digital technologies and globalization effects to automotive industry in many ways, such as global manufacturing expansion force manufacturer moves production base to the lower labor cost country, digital technology change sale system to online sales to get customers from wider area, higher competition between global brand and local brand due to more knowledge and technologies transfer.

Currently, the automotive industry in Thailand emphasizes production for export more than domestic consumption. However, the trend of exporting has not grown due to higher competition among the countries in South East Asia, the threat factors from new technology, trend of Electric Vehicle (EV) may affect Thai automotive industry and force automotive manufacturers to adapt to the new challenges (Wanna, 2020). According to ASEAN monthly vehicle sale report (2023) in Figure 1, Thailand monthly vehicle sale in 2023 was lower than in the last 2 years and Thailand had the third highest vehicle sale in ASEAN after Indonesia and Malaysia.

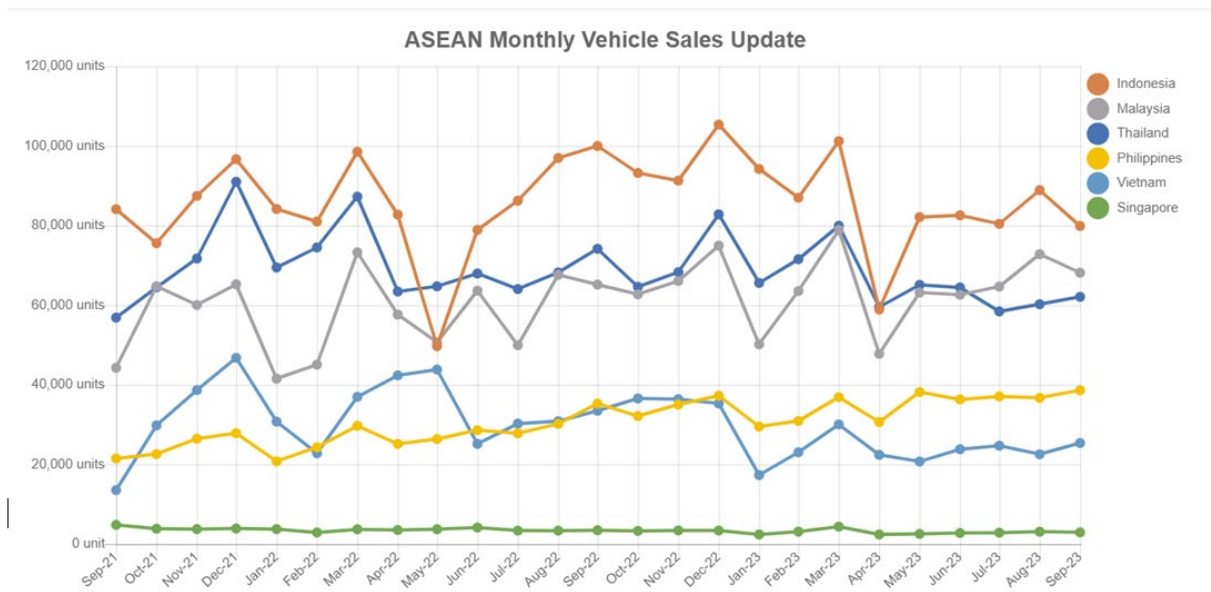


Figure 1: ASEAN Vehicle Sales Report (2021-2023)

Source: Mark Lines Vehicle Sales Data based on statistical data from the automobile associations of each nation

The potential improvement of automotive manufacturers not only relies on design and production activities, but also on logistics activities which is also very important for improvement of company potential. Increasing logistics efficiency in operation management, service reliability, customer responsibility, and cost management are important for Thai automotive spare part manufacturers to increase their competitive advantage in the current situation of world automotive industry (Green et al., 2008).

To improve logistics efficiency in Thai automotive manufacturers, organization need to focus

on important factors that affect its logistics performance. According to literature review, there are many factors affecting logistics performance, such as information technology, government and industrial policy, partner relationship, logistics infrastructure, and economic growth and development which are considered as external factors and uncontrollable. (Diskaya, F. & Senol, E., 2023; Van, N.M. et al., 2022; David, W.H. et al., 2017). Organization's internal environments are also considered as another important factor that affects the performance in many criteria. In this research, organization's internal environment such as organization structures, information technology, employee skills and knowledge, operation performance, financial capability, and logistics activities (AISHATU et al., 2022; Karanja, 2015; Zeitun & Tian, 2014; Nisarath, 2018) were selected as independent factors for studying the affective result in logistics performance.

The researcher therefore paid attention to improving logistics performance of automotive spare parts manufacturers in the Eastern Economic Corridor (EEC) area in Thailand, due to the higher density of automotive spare parts manufacturers in that area and the support of government policy in develop the eastern area to be hub of automotive industrial. This research focuses on factors affecting the potential development of automotive spare parts manufacturers and how to adapt those factors to solve the internal and external problems and obstacles that the organizations faced, including examining the support from government and private sector to improve logistics performance of automotive spare parts manufacturers in Thailand. The objectives of this research were (1) to examine the important value of organization factors, logistics performance, and organization efficiency (2) to measure the important value of factors that affecting logistics performance and logistics efficiency of the automotive spare parts manufacturers in Eastern Economic Corridor in Thailand. This research is quantitative research. Data were collected by questionnaire from 301 automotive spare parts manufacturers in Eastern Economic Corridor in Thailand.

## **2. Literature Review and Hypothesis Development**

### **2.1. Organization's Internal Environments**

The internal business environments play an important role in shaping the competitiveness of the firms (Hine and Ryan, 1999). It refers to the environmental organizations that exist in a normal firm and have immediate consequences. (Sakas et al., 2014). Internal business environment is comprised of factors within the company which impact on the success and approaches of the operations. According to the literature review, internal organization factors that affecting business performance can be divided into 5 categories which are (1) company structure and policies (2) financial and investment (3) information technologies (4) employee knowledge and skills and (5) operational excellence (AISHATU et al., 2022; Karanja, 2015; Zeitun & Tian, 2014).

Company structure and policies are the main factors which affecting business performance. According to the research of Zeitun and Tian (2014), and Margaritis and Psillaki (2007), company structure which included business size, organization structure, and types of business, have strong relationship with business performance. While the research result of Schiantarelli and Sembenelli (1997) showed the positive relationship between company policies and firm performance. Financial and investment play an important role for every business, according to research result of Aishatu et al., (2022). It explained that a financial strategy is a type of functional strategy that related to company's business plan, which creates both negative and positive impact on business performance, and it is also strongly linked to investment activities.

The level of information technologies that implementing in organization has strong relationship with business performance. Mgunda (2019) explained that information technology can increase business performance by creating a broad open market opportunity, managing, and analyzing big data, increasing flexibility in information management. Scheck (2023) also explained that information technology can help company improve productivity and customer service. Human Resource is the key

success factors for business organization. Siddiqui (2014) studied the relationship of successful organizations and employee performance, the result shown that most of the successful organizations pay attention to employee performance development. Employee performance will help organization increase productivity, reduce cost, increase competitive advantage, and create good reputation for organization.

Last internal factor that was used in this research is “operational excellence.” Operational excellence was described as the strategy for organizations aims to deliver a combination of quality, cost, and service that no other organization in the market or industry can match (Robins and Wiersema 1995). According to the Shingo Institute, operational excellence considers as a business function of twenty-first century organization. It affects business performance, quality improvement in both operation management and human resource (Seddon, 2019).

## 2.2.External Environment Analysis

The external environment factors are important, because they cause direct and indirect effects on business operations, strategic planning, and revenue. The concept of external business environment is an attempt to understand the outside forces of the organization boundaries of business (Akpoviro & Owotutu, 2018). There are two main types of external business environment, which are direct environment and indirect environment (Adeoye, 2013). Direct environment are the factors that directly affect business operation and performance, such as customers, competitors, and suppliers. Indirect environment are the elements that have an indirect influence on the business organization, such as social, technology, and political environments. This research will focus on 4 main indirect external business environment that were developed by Francis Joseph Aguilar in 1967, which are political, economic, social, and technology (Craig & Campbell, 2012) and focus on supplier, one of the direct external business environments which related to logistics and supply chain performance. According to the study of Sammut - Bonnici and Galea (2015), PEST Analysis could be a great fundamental value to business organization. The analysis can be conducted for all business organizations, for some specific business departments, or for some specific products and services.

## 2.3 Logistics Theory and Logistics Performance

Logistics is one of the essential components in supply chain management. The Council of Supply Chain Management Professional (2013) defines logistics management as “that part of Supply Chain Management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers’ requirements”. Waters (2019) presented logistics as “the function responsible for the flow of material from suppliers into an organization, through operations within the organization and then out to customers”.

Lambert et al. (1998) explained that there are many activities under logistics umbrella; however, if we focus just only logistics’ activities, there are 14 main activities illustrated in Table 1.

Table 1: Logistics Activities

Logistics Activities	
- Customer service	- Plant and warehouse site selection
- Demand forecasting	- Procurement
- Distribution communication	- Packaging
- Inventory control	- Return goods handling
- Material handling	- Salvage and scrap disposal
- Order processing	- Traffic and transportation
- Parts and service support	- Warehousing and storage

There are various studies confirming the relationship between logistics activities and business performance, and on the other hand, several studies investigated the relationship between organizational factors and logistics performance (Pan et al., 2019). World Bank determined countries' logistics performance index into six components, which are (1) customs and border management clearance, (2) quality of trade and transport infrastructure, (3) competitive price for international shipment, (4) competency and quality of logistics service, (5) ability to track and trace consignment, and (6) frequency with which shipments reach consignee (World Bank, 2023). However, logistics performance index for business organization uses different components. Langley Jr and Holcomb (1992) explained that the value customers received from logistics activities also serve as an indicator of logistics performance. In this research, we are using Industrial Logistics Performance Index (ILPI) that was developed by Division of Logistics, Department of Industrial Promotion, Ministry of Industry. This ILPI was decided by considering various processes covering nine logistics activities, which are demand forecasting and planning, customer service and support, logistics communication and order processing, purchasing and procurement, material handling and packaging, site selection, inventory management, transportation, and reverse logistics (Ministry of Industry, 2022).

## **2.4 Logistics Efficiency**

Efficiency refers to the internal functioning of logistics and generally is considered best represented through some ratios of normal level of inputs to the real level of outputs (Fugate et al., 2010). The efficiency of a logistics organization can be assessed through various performance indicators, such as on-time delivery, order accuracy, inventory turnover, cost per unit, and customer satisfaction. However, it is important to note that specific efficiency measures may vary depending on the context and goals of the logistics organization (Christopher, 2022). Here are a few key references that discuss the efficiency of logistics organizations

**Quality:** refer to the quality of logistics activities toward to customer satisfaction. Quality also defines as the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

**Quantity:** refer to the amount of logistics activities that service provider able to serve to their customer in one period.

**Time:** refer to the time that logistics activities spend to complete each job task.

**Cost:** refer to the direct and indirect cost of logistics activities that support organization requirement.

## **3. Methodology**

### **3.1 Purpose of the Study**

The objective of this study is to examine the operational potential, evaluate the operating potential, enhance the efficacy of the industry's logistical operations, and compare the performance before and after the performance enhancement of the medium and large automotive manufacturers in the Eastern Economic Corridor (EEC).

### **3.2 Conceptual Framework and Hypotheses**

The conceptual framework for the research is as follow

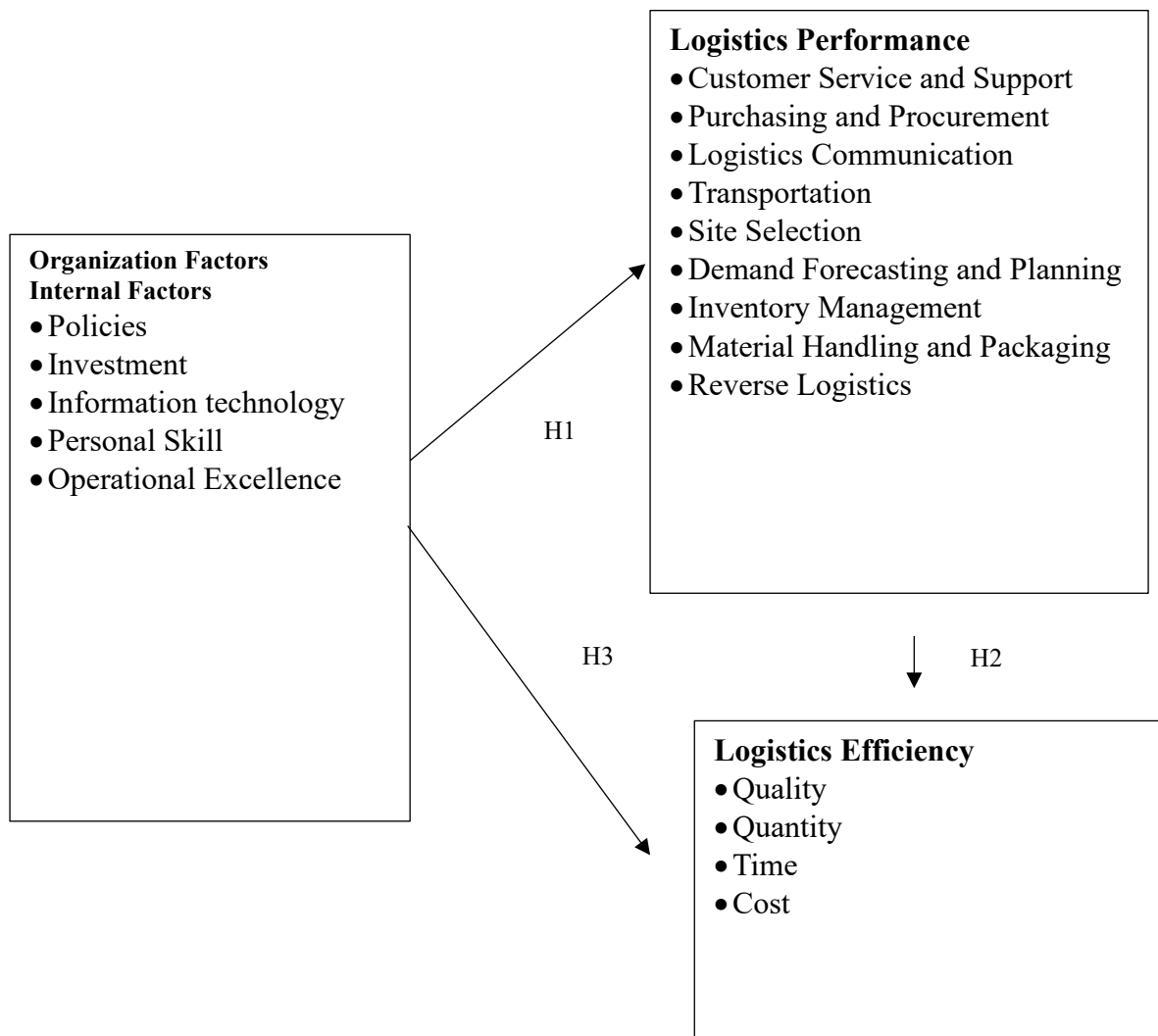


Fig. 2: Conceptual Framework

**Hypothesis:**

*H1: organization factor will be positively influenced by logistics performance related factors.*

*H2: logistics performance will be positively influenced by logistics efficiency.*

*H3: organization factor will be positively influenced by logistics efficiency factors.*

**3.3 Population and Sample group**

The population used in the study was automotive spare parts manufacturers in the Eastern Special Development Zone which located in the provinces of Chachoengsao, Chonburi and Rayong, Thailand. The data collection for the questionnaire was conducted using a combination of online and in-person methods. To determine the sample size for data analysis, the general rule of thumb was used by referencing Hair et al. (2014). The sample size for structural equation modeling analysis should not be less than 100 samples, and the proportion of the sample size to the number of parameters needed to be

estimated around 10-12 samples per parameter, according to the general rule of thumb cited in Hair et al. (2014). In this preliminary study, there are 27 parameters; therefore, the minimum sample size required to collect is 270 samples. However, in this study, 450 questionnaires were sent out to 450 automotive spare parts manufacturers and 320 questionnaires were returned. All 320 questionnaires were taken to check the completeness of response by checking number of completed answer of each returned questionnaire. After checked the completed returned questionnaires, 301 responses from 301 manufacturers were able to be used as sample group, which has the sample size more than the minimum requirement, convenient sampling was used as sampling technique for this research. The research utilized a questionnaire collection method to gather data in four key areas:

- Organization factors (Internal factors)
- Logistics performance
- Organization efficiency

The questionnaire was developed from literature review and related research papers, and send to three experts to evaluate the Index of Item – Objective Congruence (IOC) to verify that each item accurately captures its intended construct, thus contributing to the enhancement of the assessment’s validity. The pilot test, which was conducted with 30 participants, demonstrated a Cronbach’s Alpha score surpassing 0.7, affirming the dependable measurement of the specified construct and bolstering the overall reliability of the test results, consistent with the guidelines outline by Nunnally and Bernstein (1994). The questionnaire survey was carried out from July 2022 to December 2022. The statistics used for data analysis were descriptive statistics, and Co-variance Structural Equation Modeling: SEM by using JAMOV program.

#### 4. Findings

Part I Results of the analysis on general characteristics of automotive spare parts manufacturers in the Eastern Special Development Zone (Characteristics of Organization) using descriptive statistics, namely: frequency, percentage.

The results of the analysis of entrepreneurial characteristics were found that nearly 50% of companies whose major shareholders were Japanese, 40% were Thai, another 6% percent were Thai and Japanese, and the rest were 4%. The number of employment (persons) was between 200 - 500 people, which stands for 32.9 %. Most of the company were in the first tier in automotive supply chain, which stands for 83%. Main products of the companies were automotive parts and components. Most of the respondents have expertise in logistics management and operation performance, which stands for 28.9%; followed by operation performance, which stands for 26%. The analysis results of mean score, standard deviation, skewness and Kurtosis of each observe variables were shown on table 2 as below:

Table 2: The analysis results of mean score, standard deviation, skewness and Kurtosis of each observe variables

Observe Variables	Mean	Std.	Skewness	Kurtosis	Level
	Statistic	Deviation			
	Statistic	Statistic	Statistic	Statistic	
Policy	4.07	0.66	0.12	0.24	High
Technology	4.17	0.56	0.17	-0.66	High
Personal Skill	4.03	0.63	0.25	-0.74	High
Operational Excellence	4.11	0.53	0.65	-0.69	High
Investment	3.72	0.51	0.61	0.69	High
Customer Service	4.16	0.55	0.65	-1.04	High

Purchasing	3.91	0.45	0.72	1.49	High
Order Processing	3.91	0.39	1.06	2.38	High
Transportation	4.01	0.45	1.07	0.88	High
Warehousing	3.94	0.40	1.22	1.96	High
Demand Forecasting	3.92	0.41	0.98	2.13	High
Inventory Management	3.95	0.40	1.05	2.25	High
Materials Handling Pkg	3.96	0.44	1.18	1.39	High
Reverse Logistics	3.95	0.50	0.71	0.56	High
Cost	3.86	0.43	0.70	1.79	High
Quality	4.18	0.58	0.50	-1.32	High
Quantity	4.19	0.61	0.28	-1.23	High
Time	4.17	0.63	0.30	-1.30	High

The table 2 shown the means score for all observe variables in this research, the mean score for all observe variables are in high level. If we consider at each latent; for the internal organization factors, technology is the most important factors for this talent, follow by operational excellence, policy, personal skills, and investment. For Logistics performance, customer service considers as the most important factors for automotive spare parts manufacturer, follow by transportation, material handling and packaging, Inventory management, reverse logistics, warehousing, demand forecasting, purchasing, and order processing. For the last latent is Logistics efficiency, the most important factors for this latent is quantity, follow by quality, time, and cost.

Part 2 the results of the analysis on organization factors, logistics performance and organizations' logistics efficiency levels, using Structure Equation Model was shown as Fig. 3.

The research team examined logistics operational models by considering their worldwide implementation and the process of digital transformation. This study examined the automotive spare parts manufacturers in the Eastern Economic Zone (EEC) by employing the Maximum Likelihood approach with the JAMOVI ready-made program (Doval et al., 2023). The objective is to assess the level of agreement between the created model and the empirical data. The criteria for assessing the congruence between the model and the empirical data are as follows:

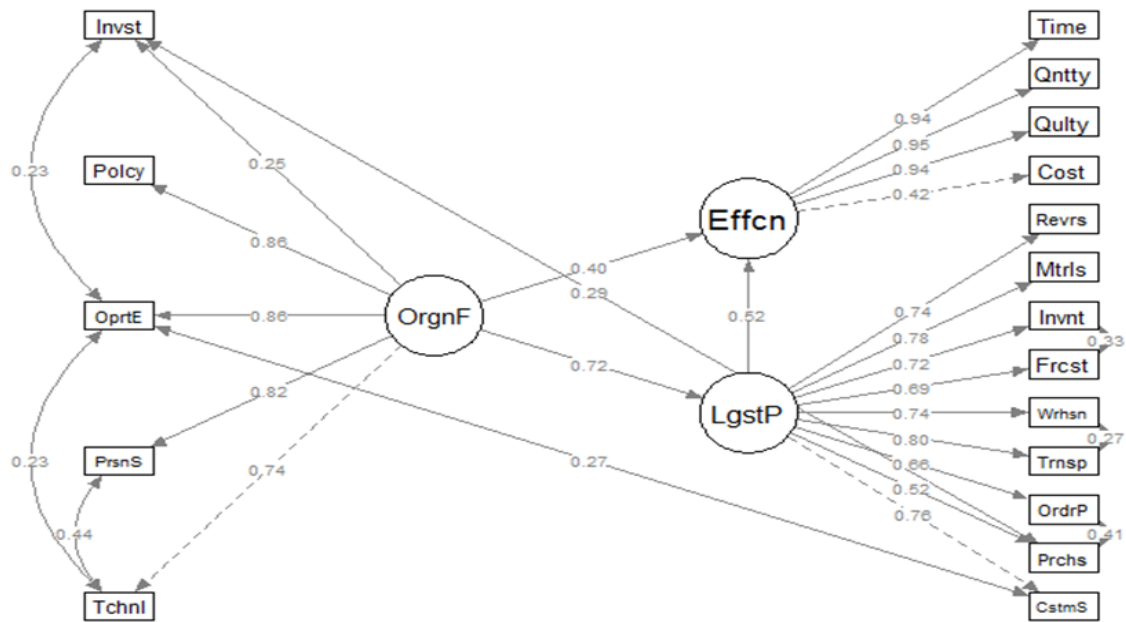


Fig. 3 Model Enhancing Logistics Performance through Organizational Factors

Table 3: Measurement model

Latent	Observed	$\lambda$	SE	t-value	Sig.	R <sup>2</sup>
Organization Factor	Technology	0.743	0.000			0.552
	Personal Skill	0.817	0.060	18.22	< .001	0.667
	Operational Excellence	0.862	0.070	16.47	< .001	0.743
	Policy	0.863	0.080	14.54	< .001	0.745
	Investment	0.253	0.081	4.190	< .001	0.064
Logistics Performance	Customer Service	0.759	0.000			0.577
	Purchasing	0.524	0.077	9.130	< .001	0.275
	Order Processing	0.664	0.075	11.66	< .001	0.441
	Transportation	0.804	0.074	14.44	< .001	0.646
	Warehousing	0.739	0.075	13.09	< .001	0.546
	Forecasting	0.691	0.075	12.17	< .001	0.478
	Inventory	0.716	0.075	12.67	< .001	0.513
	Materials	0.777	0.074	13.94	< .001	0.604
	Reverse	0.737	0.074	13.11	< .001	0.543

Table 3: Measurement model (Continue)

Latent	Observed	$\lambda$	SE	t-value	Sig.	R <sup>2</sup>
Efficiency	Cost	0.422	0.000			0.178

Dep	Pred	$\lambda$	SE	t-value	Sig.	R2
	Quality	0.935	0.285	7.80	< .001	0.875
	Quantity	0.949	0.288	7.82	< .001	0.900
	Time	0.937	0.285	7.80	< .001	0.878
Logistics Performance	Organization Factor	0.725	0.073	0.073	< .001	0.525
Efficiency	Logistics Performance	0.519	0.051	0.051	< .001	0.727
Efficiency	Organization Factor	0.398	0.045	0.045	< .001	0.727

According to this Measurement model in Table 3, we examine the latent construct of "Organization Factor", which is an unobserved variable that represents an underlying organizational capability or characteristic. Observed Indicators in this model include five observed variables, which are Technology ( $\lambda = 0.743$ ,  $R^2 = 0.552$ ), Personal Skill ( $\lambda = 0.817$ ,  $R^2 = 0.667$ ), Operational Excellence ( $\lambda = 0.862$ ,  $R^2 = 0.743$ ), Policy ( $\lambda = 0.863$ ,  $R^2 = 0.745$ ), and Investment ( $\lambda = 0.253$ ,  $R^2 = 0.064$ ).

The factor loadings ( $\lambda$ ) represent the strength of the relationship between each observed variable and the latent Organization Factor. A higher factor loading indicates means a stronger association. The observed variables with the highest factor loadings are Policy (0.863) and Operational Excellence (0.862), suggesting they are the strongest indicators of the Organization Factor. On the other hand, the observed variable with the lowest factor loading is Investment (0.253), indicating it is a relatively weaker indicator of the Organization Factor.

The R-squared ( $R^2$ ) values represent the proportion of variance in each observed variable that is explained by the latent Organization Factor. The observed variables with the highest R-squared values are Policy (0.745) and Operational Excellence (0.743), meaning the Organization Factor accounts for a substantial amount of the variance in these indicators. In contrast, the observed variable with the lowest R-squared value is Investment (0.064), indicating that the Organization Factor only explains a small portion of the variance in this indicator.

"Logistics Performance" is another latent variable that used in a measurement model in this paper, which uses eight observed variables are Customer Service, Purchasing, Order Processing, Transportation, Warehousing, Forecasting, Inventory, and Materials as indicators of the underlying latent construct. The key statistics reported for Logistics Performance in the document are:

Standardized factor loadings ( $\lambda$ ) represent the strength of the relationships between the latent variable and each of the observed variables. The factor loadings range from 0.524 to 0.804, suggesting that the observed variables are moderately to strongly related to the latent construct.

The R-squared ( $R^2$ ) values represent the proportion of variance in each observed variable that is explained by the latent variable. The R-squared values range from 0.275 to 0.646, suggesting that the latent variable accounts for a moderate to large amount of the variance in the observed variables.

The last latent variable that used in this paper is "Efficiency". The measurement model uses four observed variables, which are Cost, Quality, Quantity, and Time as indicators of the underlying latent construct. The key statistics reported for efficiency are Standardized factor loadings ( $\lambda$ ) and R-squared ( $R^2$ ). Standardized factor loadings ( $\lambda$ ) of Cost, Quality, Quality and Time are 0.422, 0.935, 0.949, and 0.937. The factor loadings represent the strength of the relationships between the latent variable and each of the observed variables. The loadings for Quality, Quantity, and Time are high, suggesting a strong relationship between these variables and the latent "Efficiency" construct. The loading for Cost is relatively lower, indicating a weaker relationship.

R-squared ( $R^2$ ) value for Cost, Quality, Quantity and Time are 0.178, 0.875, 0.900, and 0.878. The R-squared values represent the proportion of variance in each observed variable that is explained by the latent variable. The R-squared values for Quality, Quantity, and Time are quite high, suggesting that

the latent variable accounts for a large amount of the variance in these observed variables. The R-squared for Cost is relatively lower, indicating that the latent variable explains a smaller proportion of the variance in this observed variable.

The results presented in this document provide evidence that the four observed variables are reliable and valid indicators of the underlying "Efficiency" construct, except for the Cost variable, which appears to be a weaker indicator. A structural equation model in this paper used to examines the relationships between three latent variables, which are Logistics Performance, Efficiency, and Organization Factor. Standardized path coefficients ( $\lambda$ ) of these three latent variables are as follow:

Logistics Performance  $\leftarrow$  Organization Factor 0.725, Efficiency  $\leftarrow$  Logistics Performance 0.519, Efficiency  $\leftarrow$  Organization Factor 0.398

These path coefficients represent the strength of the relationships between the latent variables. A higher coefficient indicates a stronger relationship. The R-squared (R<sup>2</sup>) value for Logistics Performance, Efficiency, and Organization Factor are 0.577, 0.178 and 0.552. The R-squared values represent the proportion of variance in the dependent variables (Logistics Performance and Efficiency) that is explained by the independent variables (Organization Factor and Logistics Performance, respectively).

The Organization Factor has a strong positive relationship with Logistics Performance, explaining 52.5% of its variance. Logistics Performance has a moderate positive relationship with Efficiency, explaining 72.7% of its variance. The Organization Factor also has a moderate positive relationship with Efficiency, explaining an additional 72.7% of its variance. This structural equation model provides insights into the underlying relationships between these three key business performance factors. The results can be used to inform management decisions and strategies aimed at improving organizational efficiency and logistics performance.

Table 4: Model Fit

	AVE	Cronbach's $\alpha$
Efficiency	0.708	0.876
Logistics Performance	0.529	0.908
Organization Factor	0.598	0.856
<hr/>		
User Model Versus Baseline Model	Model	Criteria
Root Mean Square Error of Approximation (RMSEA)	0.047	0.05 or less
Comparative Fit Index (CFI)	0.965	$\geq 0.95$ for good fit.
Tucker-Lewis Index (TLI)	0.957	$\geq 0.95$ is often considered indicative of good fit
Bentler-Bonett Non-normed Fit Index (NNFI)	0.957	$\geq 0.95$ suggests good fit.
Bentler-Bonett Normed Fit Index (NFI)	0.937	NFI $\geq 0.90$ is often considered indicative of good fit.
Bollen's Incremental Fit Index (IFI)	0.965	IFI $\geq 0.95$ suggests good fit.

(Al-Balhan et al., 2018; Gupta, 2015; Savalei & Bentler, 2006)

The measurement model of Average Variance Extracted (AVE) is a crucial component in Structural Equation Modelling (SEM) (Mueller & Hancock, 2018; Robitzsch, 2022). AVE is a metric used to assess the convergent validity of latent constructs in SEM by measuring the amount of variance captured by the indicators relative to measurement error (Cheung et al., 2023). In SEM, the measurement model defines latent constructs using multiple indicators, reflecting study concepts, which are Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Bentler-Bonett Non-normed Fit Index (NNFI), Bentler-Bonett Normed Fit Index (NFI), and Bollen's Incremental Fit Index (IFI) (Mueller & Hancock, 2018). This model helps in estimating the relationships between latent variables and observed variables, providing insights into the underlying structure of the data (Adam, 2018)]. A well-specified measurement model with high AVE values indicates a strong relationship between the latent construct and its indicators, enhancing the reliability and validity of the SEM analysis.

According to Table 4, AVE values of all three latents are over 0.5 and Cronbach's alpha value are over 0.6. Indicators that used in this SEM measure model to defines latent constructs which are RMSEA, CFI, TLI, NNFI, NFI, and IFI have their value pass the standard criteria in every indicator.

## 5. Conclusion, Discussion, and Suggestion

### 5.1 Research Conclusion

This research investigates the impact of organizational factors on logistics performance and efficiency among automotive spare parts manufacturers in Eastern Economic Corridor (EEC) of Thailand. A quantitative approach is employed using structural equation modeling (SEM) to analyze data collected from 301 manufacturers through a questionnaire survey. The result of this research was divided into two part which are (1) the results of the analysis on general characteristics of automotive spare parts manufacturers and (2) the results of the analysis on organization factors, logistics performance and organizations' logistics efficiency levels, using Structure Equation Model.

The results of the analysis of entrepreneurial characteristics were found that nearly 50% of companies whose major shareholders were Japanese, 40% were Thai, another 6% percent were Thai and Japanese, and the rest were 4%. The number of employment (persons) was between 200 - 500 people, which stands for 32.9 %. Most of the company, which stands for 83% were in the first tier in automotive supply chain. Main products of the companies were automotive parts and components. Most of the respondents have expertise in logistics management and operation performance, which stands for 28.9%; followed by operation performance, which stands for 26%. The results of the analysis on organization factors, logistics performance and organizations' logistics efficiency levels, using Structure Equation Model showed the relationships between three latent variables, which are Logistics Performance, Efficiency, and Organization Factor. Standardized path coefficients ( $\lambda$ ) of these three latent variables are as

Logistics Performance  $\leftarrow$  Organization Factor 0.725, Efficiency  $\leftarrow$  Logistics Performance 0.519,  
Efficiency  $\leftarrow$  Organization Factor 0.398

These path coefficients represent the strength of the relationships between the latent variables. A higher coefficient indicates a stronger relationship. The R-squared (R<sup>2</sup>) value for Logistics Performance, Efficiency, and Organization Factor are 0.577, 0.178 and 0.552. The Organization Factor has a strong positive relationship with Logistics Performance, explaining 52.5% of its variance. Logistics Performance has a moderate positive relationship with Efficiency, explaining 72.7% of its

variance. The Organization Factor also has a moderate positive relationship with Efficiency, explaining an additional 72.7% of its variance; which prove that all hypothesis is true.

## **5.2 Research Discussion**

According to the research result, the Organization Factors have strong relationship with Logistics Performance, and when considering the observable variable of organization factors, the result showed that organization policy, operational excellence, personal skills, and technology are very important variable for organization factor. It showed similar result with the research of Suvittawat (2014), who studied the success key factors for Thai entrepreneurs in logistics performance. Her research result explained that labour skills, organization infrastructure and organization policy and regulation have strongly affected the logistics performance in organization. In addition, the study result of Choojan and Chutima (2016) showed that operation management and workforce skills help to improve logistics performance of organization. However, according to the research study of Pattanasiri and Chaiyakul (2023), logistics performance enhancement in the auto parts sector in Thailand, particularly in the case of the Automotive Parts Industry, not only focuses on organization factors but also on the adoption of advanced strategies like Total Quality Management (TQM), Supply Chain Management (SCM), and Efficient Consumer Response (ECR). These strategies aim to improve operational efficiency, customer satisfaction, and overall business performance. As a result to enhance the logistics performance, organization need to focus on both organization factors and new advance strategies to maximize performance improvement in logistics.

Logistics performance also have strong relationship with logistics efficiency. When considering the observable variable of logistics performance, the result showed that transportation is the most important variable for logistics performance, followed by material handling, customer service, and warehouse management. And for the observable variable of efficiency, the result showed that quality, quantity, and time are important in the same level. The result, which showed the strong relationship between logistics performance and logistics efficiency in this research, is similar to the research result of Chhabra, Goswami, Wan and Yontar to confirm that logistics performance enhancement in the auto parts sector involves logistics efficiency and sustainability (Chhabra et al., 2021; Goswami et al., 2020; Wan et al., 2022; Yontar, 2022). With the improvement in transportation system, information technology and green logistics practice will increase the efficiency in time, cost and quality for organization.

## **5.3 Research Suggestion**

Logistics performance enhancement in Thailand auto parts sector is crucial for future outlook. This study showed that improvement in logistics performance by focus on internal organization factors, which are organization policy, operational excellence, personal skills, and technology will impact on logistics and organization efficiency in quality, quantity, and time. Therefore, Thai's automotive spare parts manufacturers in the Eastern Economic Corridor (EEC) area should focus on the way to improve logistics performance by implementing right organization's policy, enhance operation performance, improve labor skills, and implement important technology in their organization. However, to increase logistics efficiency, automotive spare parts manufacturers should also focus and implement green supply chain model, which involves green procurement, green transportation, and green manufacturing in the Thai auto parts industry, correlating with improved asset turnover ratios (Tippong et al., 2020) Furthermore, a focus on collaboration through a cross-chain collaboration center model can significantly reduce transportation costs and improve overall performance in bulk transportation networks in Thailand (Maneengam & Udomsakdigool, 2022). Implementing the Logistics Service Provider Lifecycle Model alongside Industry 4.0 strategies can further enhance service logistics in the auto parts sector, as evidenced by successful case studies in Thailand (Tippayawong et al., 2016). These findings suggested a promising future for Thailand automotive parts industry logistics, emphasizing the importance of sustainable practices and collaborative approaches.

This research focuses only on automotive spare parts manufacturer who produce automotive parts for internal combustion engine car, unfortunately, electric vehicle sale volume in Thailand has been increased rapidly in these few years, study about the way to increase efficiency of manufacturer who produce automotive parts for electrical vehicle could be the good opportunity for future research.

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