

# A Causal Model Affecting The Development Of Freight Efficiency For Trucks In Thailand

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## ABSTRACT

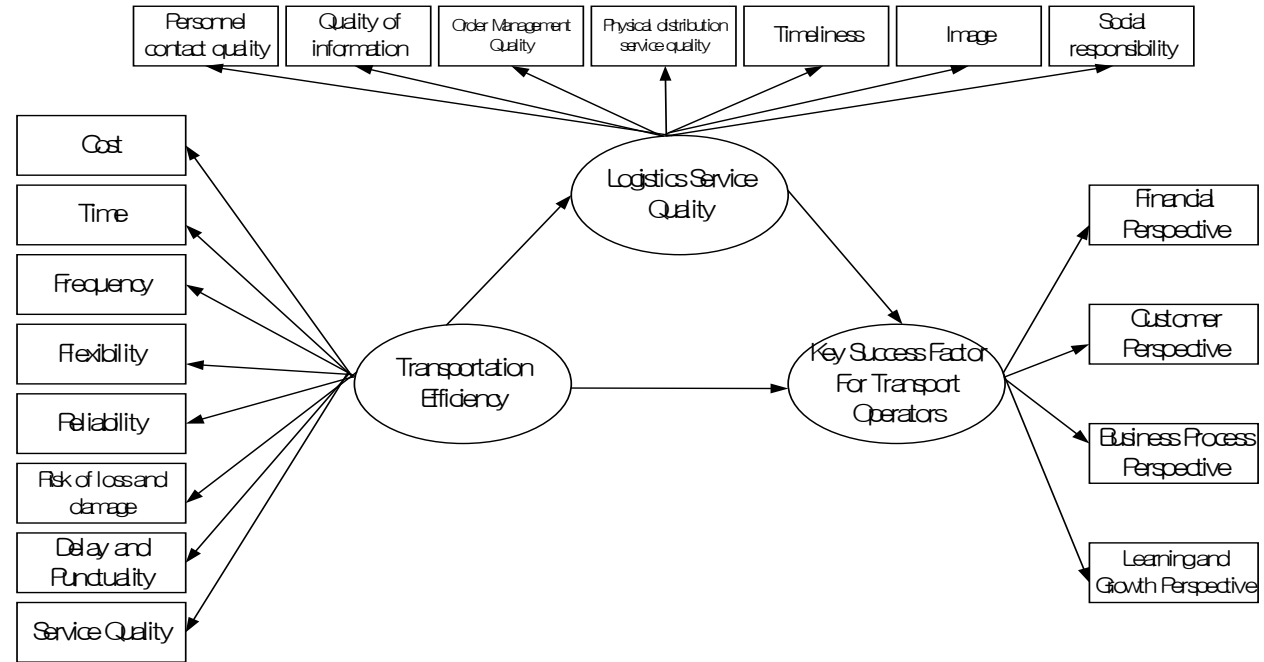
The objective of this research is 1) to study the relationship between transportation efficiency and the quality of logistics service. 2) To study the causal structural relationship of logistics service quality affecting the success of trucking operators in Thailand, which operates the freight forwarding business of trucking operators in Thailand. 3) To present a model for evaluating the transportation efficiency of truck transport operators in Thailand. The guidelines for improving the quality of transportation service of truck transport operators in Thailand. This research used mixed-method, quantitative research using survey method and qualitative research using an in-depth interview technique. The researcher applied the concept of a research framework of transportation activity efficiency. Logistics service Quality and balanced scorecard success index. Research areas are trucking establishments with regional offices in Thailand. The sample used was truck logistics operators, that registered with the Department of Transportation Which is still operating and received the Q-mark truck transportation service quality standard by the announcement of the Department of Land Transport B.E, and international road transport operators, totaling 1,092 companies, divided into target groups 1) road transport operators who have received Q-mark trucking service quality standards of 284 persons 2) operators Road freight transport by non-fixed trucks of 145 persons and 3) International road freight operators 28 persons. Th method for selecting sample size in each landscape in a proportional allocation using questionnaires is a data collection tool. The analysis of descriptive statistics, Inferential statistics, and structural equation modeling (SEM) were analyzed from the conceptual framework analysis. There are efficiency transportation 8 factors, 2) the quality of logistics services, there are 7 factors, and 3) the factors that affect the success of the transport operators have 4 factors, which the knowledge of this research is knowledge expansion and Confirming the promotion of business success, that is influenced by transportation efficiency and the quality of logistics services of truck transportation operators in Thailand.

**Keywords:** Efficiency of Transportation, Logistics Service Quality, Balancd Scorecard

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## INTRODUCTION

Thailand still has relatively high logistics costs to GDP. especially when compared with developed countries. Also, comparative competitiveness has not evolved much over the past 10 years, mainly due to the logistics system that is still mainly dependent on road transport. Thailand currently needs to stay in business competition is more intense in the field of trade and services. Therefore, improving all aspects of business operations to reduce operating costs, increase service levels, and increase business opportunities is a must. Developing efficient transportation systems is a vital mechanism for increasing competitiveness. Transportation development is currently focused on transport and keeping on schedule. Reducing the time it takes to transport goods. Is a measure of the transportation efficiency of both the transport And logistics providers Meanwhile, Customers order products more often, and the quantity ordered is reduced to reduce inventory costs. Resulting in more part of the vehicle transport in each way It has a huge impact on the carrier. The administration is more difficult and increases operating costs. The increase in the operating cost of the carrier also affects the cost of the carrier. Therefore, finding ways to increase efficiency at a reasonable and mutually beneficial to all parties is necessary. At present, many countries have adopted the concept of measuring transport activity efficiency. Used in improving transportation efficiency because it is a model that is efficient and is a sustainable transport system development and became interested in the ideas about performance measurement used to develop freight transport activity as well but the measurement of transportation efficiency was not as successful as it should have been. Probably because many organizations in Thailand clung to the concept and the traditional working practices in the past have been driven by experience and habitual non-concept or tool enabling the development of efficient transportation Not yet successful. The operator's logistics, lack of technology, and integration, As a result, the overall cost is still high, Improved logistics remembered as having made extensive carefully made. operators need to improve the quality of goods and freight to be effective enough to respond quickly to customer needs. What affects customer satisfaction. In addition to the prospective entrepreneurs to be socially responsible, then. (Jermsittiparsert, Siam, Issa, Ahmed, & Pahi, 2019) It is the quality of the manufactured products and the quality of services, cargo services. If the company has good shipping quality and efficient products, it will improve customer satisfaction. The researcher is therefore interested to study transportation efficiency. Quality of service The efficiency and quality of the delivery service will lead to the success of trucking operators in Thailand and to be used in the development of modern transport efficiency So, to build the competitiveness of enterprises in truck transportation. The research focuses on the factors affecting the performance of the transport operators. And service quality To find ways to enhance and develop cooperation Enhancing the efficiency of transport and can be the result of the practical and effective implementation will contribute to the success of the business. As well as increasing the opportunity to compete as well.



**LITERATURE REVIEW**

Review of the literature Researchers has created a framework of the research-based educational dimension of relations reasons for transport efficiency of 8 factors Including Cost, Time, Frequency, Flexibility, Reliability, Loss and Damage Risk, Delay Factors and Punctuality, Service Quality. logistics service Quality of 7 factors Including Personnel contact quality, Information quality, Order handling quality, Physical distribution service quality, Timeliness, Image, Social responsibility and factors affecting the success of truck transport operators 4 factors including the financial perspective, Customer perspective, Internal process perspective, learning and growth perspective, as Figure 1 shows the conceptual framework of the research.

**Figure 1:** Theoretical framework of the study shows the causal influence between Efficiency of Transportation, Logistics Service Quality, and Balanced Scorecard

**Transportation Efficiency: TRE**

Transportation Efficiency (TRE) Definition of Logistics Performance (LP) Efficiency is generally discussed. The ability to appropriately use existing organizational resources to achieve organizational goals. for the efficiency of logistics operations, It can be said to be the ability of activity-based operations. Logistics and Supply Chain of the Organization From planning, operation, control, and evaluation under limited resources. To create value for the organization both financial (Financial) and non-financial. (Non-Financial), including value to customers, service users, or stakeholders of the organization such as

society, communities, etc. Measures to evaluate the efficiency of logistics operations can be divided into 5 branches: 1. Plan Orders of customers and all activities related to customers, 2. Supplier, quality of raw materials, and the ability of suppliers of raw materials, 3. Production, assessors in the general product system, 4. Delivery, a measure of assessing the ability of delivery, and 5. Customer Satisfaction Measurement of the customer is important and compares between the capabilities of the organization and the expectations of the customers The main factors that businesses measure logistics performance are: want to reduce operating costs drive profits and increasing stock value. Bolstorff & Rosenbaum (2012) has introduced improvements in operational efficiency. The logistics and supply chain of organizations that aspire to best practice have presented metrics to assess the efficiency of their logistics operations by using Supply Chain Operations Reference Model (SCOR Model) PRTM Management Consulting Firm (1996) Many business or industry landscapes have adopted indicators under the Supply Chain Operations Reference Model (SCOR Model) to assess and continuously improve their operations. This is because it consists of 5 key elements: credibility. (Reliability) The ability to meet the needs of customers. (Responsiveness) Agility (Agility) Cost (Cost) Assets (Assets) (Nai Phiphayasakul, 2003) has said that Efficiency of Transportation The development of transportation aims to improve the quality of transportation to meet the standards. and the most efficient which, according to the principle of transportation, is considered An efficient transport must include the following qualities: 1. speed 2. economy 3. safety 4. convenience 5. certainty, reliability, and punctuality. And a study by Kwaengsobha (1994: 243) states that the effectiveness of Transportation has the following components: efficiency of transport. Must have the following components: 1) speed 2) safety 3) convenience and from the study of Aphiprachayasakul (2007: 108) said that the principle of efficient transport It consists of the following features: 1) speed 2) economy 3) safety 4) convenience 5) certainty, reliability, and punctuality. Including the guidelines for choosing logistics service providers and how to choose logistics service providers above, there is also a study on the development of Thai logistics service providers. Under the liberalization of the ASEAN logistics sector, Thanit Sorat (2010) stated that the development of logistics systems into practical steps in business organizations should understand the roles and duties of the providers. Logistics services as a mechanism to drive logistics activities and processes to flow efficiently. Therefore, the reasons why businesses should decide to use a logistics service provider are 1. Market Demand Forecasting by relying on logistics services that serve many customers. It gives a better picture of market movements. 2. Economies of Scope arise from the services of external logistics service providers which have a wide scope. This is to increase the efficiency of product delivery. 3. Cost distribution (Cost Sharing) is to reduce the total cost of the business. because it distributes the cost burden to many users especially the cost of storage and transportation. 4. Optimization of transport efficiency in terms of distance and time. by relying on the supply chain network of transport service providers. 5. Better financial liquidity (Working Capital Flow) due to the reduction of investment in fixed assets (Fixed Asset) such as the reduction of investment in building warehouses. And moving equipment 6. Specialists Value Using outside services will allow specialists in specific tasks to provide services to the organization. 7. Service Flexibility can change in terms of service. 8. Time Interest Due to the use of

outside services for less important tasks, the company can allocate resources to work that is the company's main job. 9. Business Synergies is the cooperation from various businesses, resulting in the integration of business operations. This is also the goal of supply chain management. 10. Responding to the diverse needs of customers (Multiple Needs Responsiveness) is better than the organization or company can operate on its own. Because the number of service providers can be increased according to the needs and service providers. Able to respond to services in various forms according to the needs of customers better from the foregoing Sometimes an organization may choose a service provider that has expertise in a particular field. It is important to understand the role of a logistics provider at this point. And it is the key to success in the successful business of trucking operators. Therefore, from the study and review of related research, it is possible to summarize the factors of efficiency of transport services of transport operators. From the above discussion it can be assumed as:

- H1 Transport efficiency (Transportation Efficiency: TRE) has a direct influence on the quality of logistics services (Logistics Service Quality: LSQ) of truck transport operators.
- H2 Transportation efficiency. (Transportation Efficiency: TRE) has a direct influence on the success of business operations (Key Success Factor For Transport Operators: KSF) of truck operators.

### **Logistics Service Quality: LSQ**

The concept of logistics service quality It is the service quality concept of Grönroos (1984), which consists of service process quality and service outcome quality. has brought the quality of service Logistics developed by Mentzer, Flint, and Kent (1999) and operational service quality concepts. and relationship service quality developed by Stank et al. (1999) and Stank et al.(2003) from the synthesis of relevant research can be applied to 5 elements: personnel quality, information quality, procedural equality, discrepancy handling accuracy. An additional element from the synthesis of concepts and theory is the cost of service and the use of technology. As for the quality of logistics service results, It is based on the concepts of Bienstock, Mentzer, and Bird (1997) based on the Physical Distribution Service Quality Model: The PDSQ Model consists of three components: timeliness, availability, and condition. The essentials to connect production and consumption (Saura, Frances, Contri, & Blasco, 2008). The logistics process is viewed as a mere cost generator without the ability to differentiate itself (Ballou, 2004; emphasis added). cited in Saura et al. (2008), but this began to change in the mid-1990s as market-based logistics research began to analyze the ability of transport to deliver quality and create Increased customer satisfaction and loyalty (Mentzer et al., 2001; Mentzer et al., 2004). The logistics service quality factor (LSQ) was critical to the study. this research Because the researcher has reviewed related concepts and theories until it can be said that Measuring the quality of logistics services It is good to use metrics that can assess service provision in the relevant elements of logistics activities. properly, Therefore, (Logistics Service Quality: LSQ) was chosen in this study with details. The following are 1. Personnel contact quality 2. Order release quantities 3. Information quality 4. Ordering procedures 5.

Order accuracy 6. Order condition 7. Order quality 8. Order discrepancy handling) 9. Timeliness. And a study by Fernandes, DW, Moori, RG, and Filho, VAV (2018), suggests that Logistics Service Quality (LSQ) increases the competitive advantage of service providers as it can lead to customer loyalty. consumption as well as can reduce the number of competitors and development conditions conducive to economic development according to the size of the enterprise, from the potential of logistics providers, consumers will assess the quality of service. but also the cost of service Technology and settings of the services delivered by the service provider. Including a study by Liu et al. (2010), conducted among logistics service providers in China, suggest that logistics capabilities are of the utmost importance for service quality. In a study, Gotzamani et al. (2010) analyzed logistics service companies and concluded that logistics capabilities (LC) have become indispensable to obtaining. where Logistics Service Quality (LSQ) includes improving financial performance for companies. Glicor and Holcomb (2014) explore the role of logistics capabilities (LC) in achieving agility, which has included an increase in Logistics Service Quality (LSQ) in terms of production flexibility, supply chain speed, and lean manufacturing. N They also point out that the degree of agility can determine the extent of efficiency and effectiveness in the quality of logistics services. Logistics capabilities (LC) can affect Customer Satisfaction (CS), however, some studies indicate that logistics capabilities (LC) influence. Logistics Service Quality (LSQ) and Logistics Service Quality (LSQ) are defined as a set of performance factors, which are measured by the ability to arrange to Distribute products according to customer requirements. As well a study by Likewise, Rao, et al. (2011), identified a strong correlation between Logistics Service Quality (LSQ), the price of logistics services, and the satisfaction of logistics services. Customer (Customer Satisfaction: CS) when the transport service is not included in the final price of the product. The price of these services has a negative influence on customer satisfaction. Tontini & Zanchett (2010) found that customers rated Logistics Service Quality (LSQ) in the following areas: the reliability of the deadline delivery flexibility Accurate delivery, accurate quantity and products, no damage to goods, flexibility in service, trouble overcoming, traceability, communication, trust and knowledge of the customer contact team. Availability of products and services After-service support and pricing. Therefore, from the study and review of related research, it is possible to summarize the factors of logistics service quality that are a tool to create satisfaction for users and to consider the quality of logistics services. From the discussion, a hypothesis can be formulated as:

- H3      Logistics Service Quality (LSQ) of truck transport operators has a direct influence on the success factor for transport operators (KSF) of operators truck transport.

### **Key Success Factor Balanced Scorecard: BSC**

Balanced Scorecard (BSC) in this research. The researcher used Kaplan & Norton's concept of Balanced Success Index (1992), which defines a measure of success under four aspects: (1) Financial Perspective (2) Perspective. Customer Perspective, (3) Internal Business Perspective and (4) Learning and Growth Perspective to be used as concepts and theories in the study of Relationship of success in the business

operation of truck operators in Thailand Because the concept of performance measurement, the Balanced Success Index is a good measure of business performance. efficiency (Kim et al., 2003., Al-Mudimigh, 2009) is consistent with Jain et al. (2007), who said that measuring performance based on the balanced success index concept can measure business performance. In addition, a review of the literature reveals that there are very few studies on measuring business performance by applying concepts and theory as a fundamental guideline for measuring business performance (Kim & Kim, 2007) and studies on freight efficiency and the success of business performance based on the balanced success index concept are also few. For example, Chang. (2007), Chang's research & Ku. (2009), Islam & Yang. (2009) and from a research study by Bundit Rungsimanont (2008), a study of indicators for the container tractor business. By applying the principles of a Balanced scorecard to create effective indicators for the container tractor business. However, the researcher has applied it as a conceptual framework together with the study of transportation efficiency that affects the success of truck operators in Thailand. It can be concluded that the transport efficiency Service quality is a development approach to upgrading the concept. to create something new or something that exists to be effective more valuable to make the work easier and more efficient, Therefore, from the study and review of related research, it can be concluded. Measuring the success of truck operators in Thailand This leads to the 4th assumption: transportation efficiency. (Transportation Efficiency: TRE) influences through the quality of logistics service (Logistics Service Quality: LSQ) of truck transport operators to success in business operations (Key Success Factor For Transport Operators: KSF ) of truck transport operators Literature supports to build a hypothesis given as:

- H4      Transport efficiency (Transportation Efficiency: TRE) influences through the logistics service quality (LSQ) of truck transport operators to success in business operations (Key Success Factor For Transport Operators: KSF. ) of truck transport operators.
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## RESEARCH METHODOLOGY

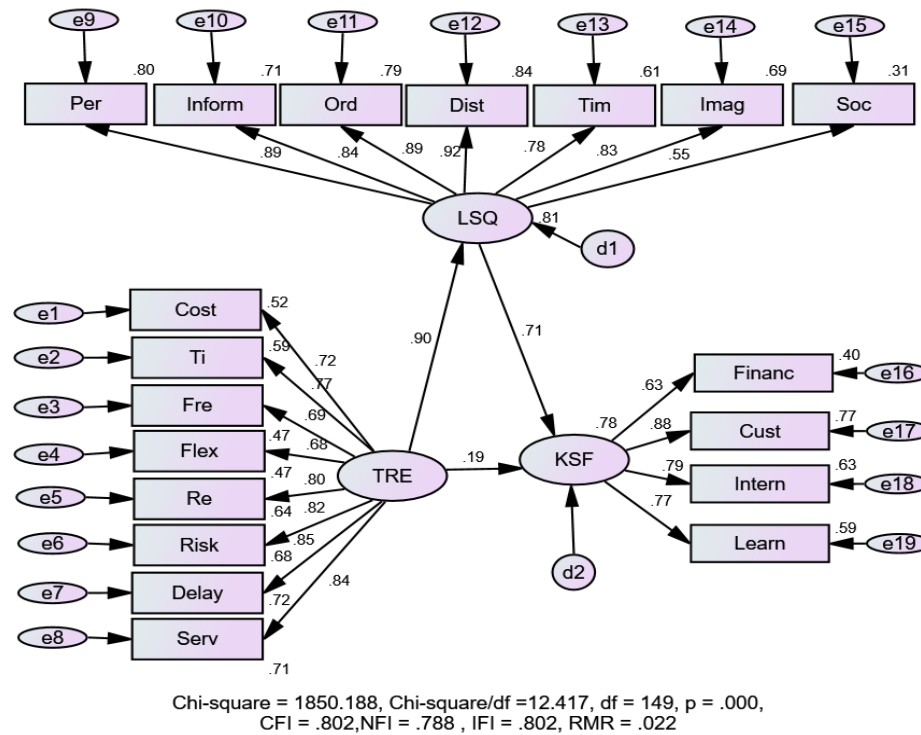
The population used in this research was a Group of trucking operators that have been registered with the Department of Land Transport (Truck Transportation Information Center, 2020) is 1. Road freight operators certified by Q-mark truck transport service quality standards. Land Transport Act 2019, 679 companies 2. Road freight operators with non-fixed trucks, 347 companies 3. International road freight operators, a total of 66 companies. The sample group used in quantitative research is the researcher's sample size criteria using the Rule of Thumb, which is a widely used and accepted sample size determination. In an analysis where multiple variables were 10-20 times the observed variables (Kline, 2011), the authors used a sample size method based on Hair et al (1995); Comrey & Lee (1992) suggesting that the size of The ideal sample size is 200-300, and Hair et al (2010) suggests that the sample size used in the study should be 10-20 times the number of variables observed in the study. The researcher has 19 observable variables. The appropriate and sufficient sample size should be at least 10

times x 19 observable variables equal to 190 samples to 20 times x 19 observable variables equal to 380 samples. of the minimum sample size that can be used for data analysis with Structural Equation Modeling (SEM) statistical tools; To receive a lot of cooperation or mean the proportion of respondents to return the questionnaire (Response Rate) is quite low, the researcher, therefore, estimated the response rate to be  $380 + (380 \times 0.2) = 456$  (Kalaya Vanichbuncha, 2006). a) to prevent data storage errors To reserve or reduce the discrepancy from the survey response of the sample group Relatively low return of questionnaires and to obtain complete and complete information, Therefore, the number of samples used in this research was 470, which was sufficient and greater than the minimum sample size that could be used for analysis. Data with Structural Equation Modeling (SEM) technical tools. From the above population, the researcher determined the sample size that is suitable for data analysis with computer-aided statistical software (AMOS) by using statistical tools and analytical techniques. this research The researcher conducted mixed-method research using questionnaires as a tool used to collect quantitative data. in which the respondents are the owners of the company Employees working in freight forwarding and employees involved in the transportation of goods, totaling 470 samples. The questionnaire was divided into 4 parts: Part 1, a questionnaire on the personal factors of the respondents. There were 8 questions. Part 2 was a question about the transport efficiency factor of 8 factors, there were 47 questions. Part 3, logistics service quality factor, from 7 factors, there were 32 questions. Item and Part 4 Factors Affecting the Success of Transport Operators Based on 4 Factors, there are 36 questions which the researcher uses measurements from the research of Day & Van den Bulte. (2002) and Battor & Battor. (2010). The measure used is a Five-point Likert-type Scale Ranging with 5 levels of values. Respondents will choose answers that are most relevant to the reality of the respondents. and examining the tools to find the correspondence between the developed question set and the theoretical content. with the technique of calculating the conformity index Out of 5 experts in the study, the researcher selected questions with a consistency index greater than 0.80 with a total of 123 questions and checked the questionnaire's validity. Reliability before use (n=30) with Cronbach's Alpha of each variable greater than 0.70, with a total result of 0.899 (Hair et al., 2006). The scope of the study content is 1. Transportation efficiency (TRE) measured from 8 observable variables 2. Logistics Service Quality (LSQ) measured all 7 observable variables and the dependent variable is the success factor of entrepreneurs in operation The measure was based on the Balanced Scorecard (BSC) with four observable variables. Qualitative Data Collection A semi-structured questionnaire was used to collect qualitative data with in-depth interviews and executives of five trucking companies, referring to the principles of Nastasi & Schensul (2005) presenting the criteria for determining The sample size of the guidelines for collecting that information In-Depth Interviews Approximately 5-30 interviews should be conducted. The data analysis consisted of Descriptive statistics such as frequency, percentage, mean, standard deviation, skewness, kurtosis, Pearson's correlation coefficient. Product Moment Correlation) and Second Ordered Confirmatory Factor Analysis, determining the statistical and chronological values used to determine the coherence of the affirmative element model with the empirical data (Kline, 2015.)



**RESEARCH RESULTS**

The results of checking the coherence of the model with the empirical data before adjusting the model. The researcher analyzed the structural equation model. Its purpose is to verify the congruence of the hypothesis model with the empirical data. and test the assumptions that have been established The correlation coefficient was analyzed. Among the 19 observed variables, Pearson's Product Correlation Coefficient was used. The correlation coefficient of all observed variables was positively correlated. and the values were between 0.196 – 0.863 with statistical significance at the 0.05 level (p-value < 0.05) and at the statistically significant level of 0.01 (p-value < 0.01). High (0.196 < r < 0.863) is a value that is within the optimum level, no problem. Multicollinearity It was shown that the relationship characteristics of the variables studied were linear correlations. where the highest correlation coefficient is The delay and punctuality factor (Delay) and the time factor (Time) and the lowest correlation coefficient were the relationships between the flexibility factor (Flex) and social responsibility (Soc) variables and the results of the analysis. first structural equation It was found that the hypothesis model was inconsistent with the empirical data. as shown in Table 1 and Figure 2.



**Figure 2:** The results of checking the coherence of the model with the empirical data before adjusting the model.

**Table 1:** The statistical values of the model's consistency with the empirical data before modifying the research model.

Conformity Index	Criteria used for consideration	statistical value	Results
Relative Chi-Square ( $\chi^2 / df$ )	< 3.00	12.417	not pass
CFI	> 0.90	0.802	not pass
NFI	> 0.90	0.788	not pass
IFI	> 0.90	0.802	not pass
RMR	< 0.05	0.022	not pass

From Table 1, when considering the statistical values, it was found that the p-value of the Chi-square ( $\chi^2$ ) = 0.000. The researcher, therefore, considered the conformity of the model from the following indices of conformity: CMIN/df=12.417. , CFI=0.802, NFI=0.788, IFI=0.802, RMR = 0.022. It was found that the model conformance index did not meet all criteria, especially the CMIN/df value, therefore the model was recalibrated. Based on theoretical reasoning in conjunction with the model modulation index (MI), when the model is harmonized, the values are within the specified criteria. Determined from Relative Chi-Square ( $\chi^2/df$ ). The results of the coherence verification of the model with the empirical data after the model adjustment after the first model coherence check. It was found that the causal model affects the development of freight efficiency for trucks in Thailand. developed by the researcher inconsistent with the empirical data The researcher, therefore, adjusted the research model. by considering the theoretical feasibility and using the index to adjust the model (Modification Indices: MI)as shown in Table 2.

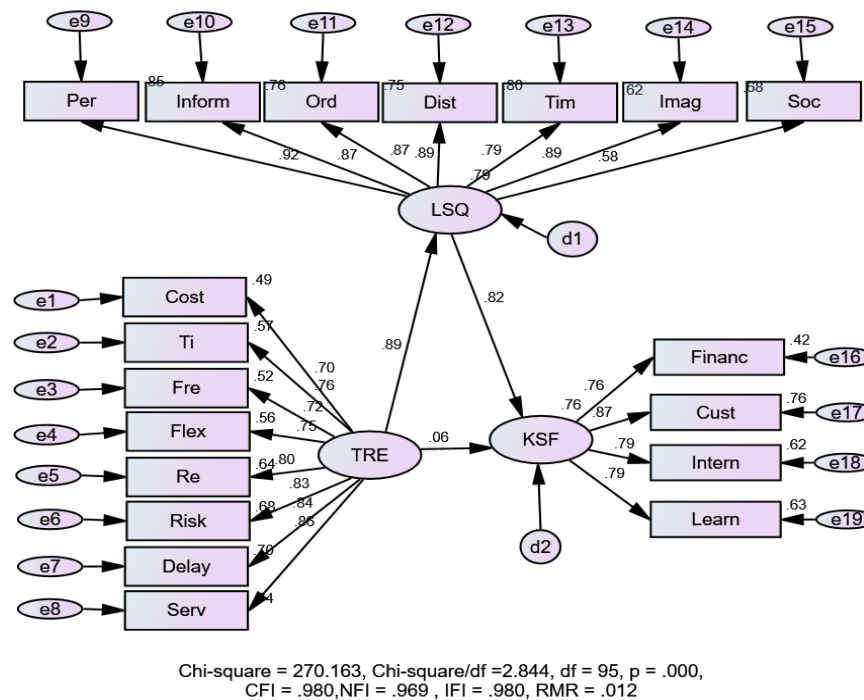
**Table 2:** Statistical values of the research model's concordance with the empirical data after the research model was adjusted.

Conformity Index	Criteria used for consideration	statistical value	Results
Relative Chi-Square ( $\chi^2 / df$ )	<3.00	2.844	pass
CFI	> 0.90	0.980	pass
NFI	> 0.90	0.969	pass
IFI	> 0.90	0.980	pass
RMR	< 0.05	0.012	pass

From Table 2, the results of the analysis of the structural equation model of the variables affecting the success factor for transport operators (KSF) of truck transportation in Thailand. After adjusting the

model, the model is consistent with the empirical data. within the specified criteria can be considered from The following conformance indexes: CMIN/df=2.844, CFI=0.980, NFI=0.969, IFI=0.980 and RMR = 0.012 are shown in Fig. 3 and Table 2.

The results of data analysis for the development of a causal model affecting the improvement of freight efficiency for trucks in Thailand. To examine the consistency of the linear structural relationship model of variables affecting business success (Key Success Factor For Transport Operators: KSF) of freight forwarding for trucks in Thailand. according to the hypothesis model of the research conceptual framework that the researcher.



**Figure 3:** The results of the conformity examination of the structural equation model of the Key Success Factor for Transport Operators (KSF) of freight forwarding for trucks in Thailand. with empirical data after model adjustment

**Table 4:** The statistical values of the observed variables from the structural equation model analysis of the variables affecting business success (Key Success Factor For Transport Operators: KSF) of freight forwarding for trucks in Thailand. after adjusting the model

Latent variable	Observable variable	factor loading	S.E.	C.R.	p-value
TRE	→ LSQ	0.888	0.069	17.945	***

TRE	→	KSF	0.060	0.096	0.777	0.437
LSQ	→	KSF	0.816	0.085	8.486	***
TRE	→	Cost	0.698	0.049	17.711	***
TRE	→	Ti	0.756	0.065	17.711	***
TRE	→	Fre	0.723	0.074	15.337	***
TRE	→	Flex	0.750	0.069	15.487	***
TRE	→	Re	0.799	0.071	17.196	***
TRE	→	Risk	0.827	0.063	17.597	***
TRE	→	Delay	0.835	0.066	17.736	***
TRE	→	Serv	0.860	0.057	18.197	***
LSQ	→	Per	0.923	0.046	26.737	***
LSQ	→	Inform	0.872	0.030	26.737	***
LSQ	→	Ord	0.867	0.027	29.783	***
LSQ	→	Dist	0.895	0.027	32.122	***
LSQ	→	Tim	0.789	0.043	20.694	***
LSQ	→	Imag	0.894	0.035	25.976	***
LSQ	→	Soc	0.582	0.048	13.369	***
KSF	→	Financ	0.758	0.071	16.180	***
KSF	→	Cust	0.872	0.054	16.180	***
KSF	→	Intern	0.789	0.047	14.945	***
KSF	→	Learn	0.792	0.059	13.612	***

From Figure 3 and Table 4, it was found that the component weight of the observed variables for the latent variables in transport efficiency. (Transportation Efficiency: TRE) for all 8 variables, the values were between 0.698 – 0.860. The weight of the observed variables of the latent variables of Logistics Service Quality (LSQ) in all 7 variables had values. Between 0.582 – 0.923, the value of the component

weight of the observable variables of the latent variables in business operation (Key Success Factor for Transport Operators: KSF) for all 4 variables was between 0.758 – 0.872 when considering the component weights of the observable variables. All observed variables had a CR (Critical Ratio) > 1.96, indicating that all observed variables had a non-zero component weight. The observed variables were statistically significant at the 0.05 level ( $p$ -value < 0.05). It was concluded that those observed variables were important indicators of the latent variables. From the research results to analyze the composition of “A causal model affecting freight efficiency development for trucks in Thailand” to study the causal structure relationship of transport efficiency. logistics service quality that affects the success of trucking business operators in Thailand and presents a model to assess the transportation efficiency of truck operators in Thailand. There are interesting issues that the researcher will discuss the results as follows: 1. transport efficiency (Transportation Efficiency: TRE) from the results of the analysis of the structural equation model of the variables affecting business success (Key Success Factor For Transport Operators: KSF) of the transportation of trucks in Thailand. After adjusting the model, the model is consistent with the empirical data. within the specified criteria Determined by the conformity index,  $CMIN/df=2.844$ ,  $CFI=0.980$ ,  $NFI=0.969$ ,  $IFI=0.980$  and  $RMR = 0.012$ . The results of data analysis for the development of a causal model affecting the improvement of freight efficiency for trucks in Thailand. To examine the consistency of the linear structural relationship model of variables affecting business success (Key Success Factor For Transport Operators: KSF) of freight forwarding for trucks in Thailand. which transport efficiency (Transportation Efficiency: TRE) has a direct influence on the logistics service quality (LSQ) of truck operators. The result of hypothesis testing found that transportation efficiency (Transportation Efficiency: TRE) has a direct influence on the quality of logistics services (Logistics Service Quality: LSQ) of truck transport operators. With a statistically significant level of .001, when considering each variable, it was found that the transport efficiency (Transportation Efficiency: TRE) in the service quality factor (Service Quality) has the highest component weight equal to 0.860, which is consistent with the research of Irene et al. (2008) found that Standard company logistics services have a positive influence on customer satisfaction and research by Fernandes et al. (2018), which found that The quality of logistics services has a positive influence on customer satisfaction. 2. Logistics Service Quality (LSQ) of truck transport operators has a direct influence on the success factor for transport operators (KSF) of transport operators. truck The results of the hypothesis testing revealed that the Logistics Service Quality (LSQ) of truck transport operators has a direct influence on the success factor for transport operators (KSF) of transport operators. truck With a level of statistical significance of .001, when considering each variable, it was found that Logistics Service Quality (LSQ) and Personnel Contact Quality factor had the highest component weight. equal to 0.923, which is a finding in this research. 3. The Key Success Factor for Transport Operators (KSF) consists of 1) Financial Perspective (FIN) 2) Customer Perspective (CU) 3) Internal Process Perspective (INT) 4) Perspective Learning and Growth (LEA) when considering standard coefficients Indirect influence (IE) of the Key Success Factor For Transport Operators (KSF) of truck transport operators, In conclusion, the congruence of the assumptions was found that the transportation efficiency (Transportation Efficiency: TRE) has a positive

indirect effect on business success (Key Success Factor For Transport Operators: KSF) with the quality of logistics services (Logistics Service Quality: LSQ) is a variable. Intersect There is a path of influence between transport efficiency (Transportation Efficiency: TRE) and Logistics Service Quality (LSQ) The route coefficient was 0.888 and the route influence between Logistics Service Quality (LSQ) and Key Success Factor For Transport Operators (KSF) has a route coefficient of 0.816, so the indirect effect is  $(0.888) (0.816) = 0.725$  transport efficiency (Transportation Efficiency: TRE) has a positive indirect effect on business success (Key Success Factor For Transport Operators: KSF) with the quality of logistics services (Logistics Service Quality: LSQ) is a variable. Intersect This is consistent with hypothesis 4, which is the findings of this research.

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## DISCUSSION AND CONCLUSION

The next research study should focus on entrepreneurs in reading the questions in the questionnaire that should be short, concise, easy to understand, and not too many questions. On the other hand, this will result in operators becoming bored and uncooperative in answering questions and providing information. Moreover, the language used should be a language that is easy to understand and that is commonly used or close to everyday life. It may not be a language that adheres to academics. statistics or from documents too much textbook Including the sample used in the research must be the person who is responsible or who has knowledge directly involved in answering the questionnaire. and following group assignments Examples used in research that hurt providing accurate information affect credibility Therefore, data collection is a very important step in controlling the process effectively, so that reliable and usable data can be obtained.

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