International Business Management 10 (2): 129-133, 2016
ISSN: 1993-5250


# The Logistics Freely Moving of International Road Freight Transport Services Provider Impact to Quality Efficiency in Manufacturing Industries in Thailand

Siriraks Khawchaimaha and Jarun Bootdachi
Faculty of Management Science, Khon Kaen University, Muang, 40260 Khonkaen, Thailand

**Abstract:** This study investigates the logistics freely moving of international road freight transport services provider impact to quality efficiency in manufacturing industries in Thailand. The analysis process had taken multiple regression analysis to assessment the impact from the liberalization of international road freight transport services provider to quality efficiency. Then, the results show that the liberalization of international road freight transport services provider positive impact to quality efficiency. Next, the finding suggests that the liberalization of international road freight transport services provider improve quality efficiency which greatly reduces in material losses, reworking losses and defective losses. Finally, this is an opportunity for international road freight transport services provider should extremely build up the transfer service in to assurance the height quality of intermediates goods supplying for which remarkably improve quality efficiency in manufacturing industries in Thailand.

**Key words:** Liberalization of international road freight transport services provider, quality efficiency, manufacturing industries in Thailand, reworking losses, defective losses

## INTRODUCTION

Associate of Southeast Asian Nation (ASEAN) have a policy to freely moving of international road freight transport services provider to boost up the production intra ASEAN. Primarily as EAN Economic Community: AEC has a strategy of Roadmap for the Integration of Logistics Services (RILS) which open trade area for international road freight transport services provider in ASEAN. Next, the movement of material and resources from the point of origin to the point of manufacture is inbound logistics or the logistics of production (Gonzalez, 2002). Mainly, AEC has massaged "free movement of goods and establish ASEAN single production base" (ASEAN, 2008); also it can be implied that AEC supports freely moving of international road freight transport services provider to civilizing the manufacturing intra ASEAN.

Liberalization of international road freight transport is a strategic which might be trusted to promote an effectively transferring of intermediated goods from supplier to point of production. Mostly, if logistics service providers failure the production schedule, manufacturers can't make the final goods to delivery and selling on time (Florian *et al*., 2011). So that the study in liberalization of international road freight transport services provider for industries is very important.

Generally, the customers consume in the qualified product (OSMEP, 2013). Noticeably, manufactures usually focus on Quality Efficiency (QE) to control the capability of production such as carbonated soft drink, alcoholic drink and milk (DIWT, 2012). Academically, quality efficiency is quality rate which is the ratio of unaccepted amount per total produced amount (Bamber *et al*., 2003). So that the school work study in quality efficiency is very significant to manufacturing industries in Thailand.

The raised question is "Do freely moving of international road freight transport services provider improves quality efficiency in manufacturing industries in Thailand?" which have not been examined. So that this research intends to discover the impact from the liberalization of international road freight transport services provider to quality efficiency in manufacturing industries in Thailand and which could be made a considerably to manufacturing firms in Thailand in the future.

## MATERIALS AND METHODS

**Liberalization of international road freight transport services provider:** International road freight transport ser vices provider mean mediator to move the physical goods from terminal to destination by vehicle mode on road line. Then, road freight is the middle cost which has been used

**Corresponding Author:** Siriraks Khawchaimaha, Faculty of Management Science, Khon Kaen University, Muang, 40260 Khonkaen, Thailand

for bringing the product from transit point direct to the manufacturing site. The transport time is valued for service buyers because time saving relevant the scheduling. It influences an eliminated waiting time interchange time and provide the rapid access to destination at the manufacturing site (Pourakbar *et al*., 2009).

Road transportation mode have a many network and cross road linkage on land which implication of road freight transport service can be served in front of manufacturing factory as the delivery destination. Then, the road transportation mode has been used for short distance to access the point of inventory and manufacturing site in contrast, they take rail freight transportation mode for long distance journey on land (Yamada *et al*., 2011).

The road freight transport services are traditional transport mode to access the urban region and it is flexible of transport as the speed adjustment in order serving (Cherrett *et al*., 2012). They have to respond to vehicle load standard, vehicle road safety, fee charge of cross border road distance. Road freight transport characteristic is contained with ton-weight per times follow state or government regulation only. So that the road freight transport services provider need to improve and saving their energy of vehicle and optimize vehicle energy with the delivery speed.

International road freight transport services provider moves the physical goods from point of origin to the point of manufacturing site by vehicle on road line. The maximum of container utilization of fully loaded at 1 times which object to reduce road transport times and transport cost. The most effective of this service are short transport time and low of transport services cost. The opinion of the customer to intend to use is very important to measuring and it's meaningful for the transport services provider.

**Quality Efficiency (QE):** Quality efficiency is the ratio of the amount of good product per processed amount (Mathur *et al*., 2011). This definition leads to find the quality fault and reduce defect numbers (Bamber *et al*., 2003). Then, manufacturing firm has been considering in quality rate which take action in quality problem reduction; hence, they look useable productive, reduce failure to improve quality, provide additional capacity, quick change and design product. The losses in quality mode are following:

Firstly, defect and work in process is defined of losses in reason of failure in defected product and product reworking (Nachiappan and Anantharaman, 2006; Jeong and Phillip, 2001). Defective product was produced during the production period; also, their passed production to final goods which can't use as scrap (Anvari and Edwards, 2011).

Secondly, reworking is the final goods that miss specification but it may be usable which is required to reparation; quality caused by the malfunctioning production equipment as well (Nachiappan and Anantharaman, 2006; Jeong and Phillip, 2001). Firms expect to reduce defective defect to turn to excellent product (Tsarouhas, 2007).

Secondly, material losses are definitely of losses in reason of material weight difference between input and output (Nachiappan and Anantharaman, 2006; Jeong and Phillip, 2001). There can explain as waste of material during the production, poor preparation and occur from machine start-up to stabilization (Anvari and Edwards, 2011).

Quality efficiency is the ratio of the amount of good product per processed amount. Then, the importance of quality efficiency indicates the proportion of defect products per total production volume. Especially, quality efficiency calculation represents the good part of total production. The losses in quality efficiency mode include defect and work in process and material losses (Fig. 1).

**Manufacturing industries in Thailand:** Manufacturing industries in Thailand plays an important role for nation economic. Manufactures in Thailand had exported overall 15.97 billion USD in 2014; however, they import the goods and intermediated goods 12.03 15.97 billion USD in 2014 (Bank of Thailand, 2015). The Manufacturing sector has highly played the stability for economics in Thailand but their critical problem can be explained as follows:

Firstly, manufacturing industries face the problems of global standardization. The industrial standard have numbers of authorize of certifying agencies such as Department of Livestock, Department of Fisheries, Department of Agriculture and Thai Industrial Standards Institute; moreover, many of them are adopt from International Standard Organization (ISO). There increase the operation which relates cost and investment; therefore, the unit of product cost is being increased.

Secondly, high excise tax is problematic for some manufacturing firms. The some of sector have to pay excise tax 60%, since the state rule controls the product

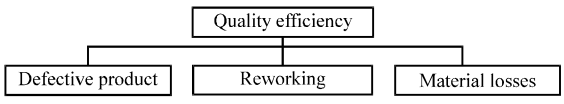


Fig. 1: Quality efficiency and important variable to measure

consumption (ETDT, 2012) which will effect to the high retail price and hardly to sell as well. Then, manufacturing firms in Thailand face to cost of input factors increasing.

Manufacturing industries is forced to increase quality efficiency with intention the industrial standard and production cost of input factor. So that, manufacturing industries in Thailand have to reduce losses in quality mode; they have to produce the goods with a maximum output by least unit cost for sustaining the profit. This means the manufacturing firms in Thailand are needed to improve quality efficiency level.

**Method:** The population in this research was top management or company representative in manufacturing industries in Thailand that had registered with Department of Industrial work of Thailand. Then, they had to operate until the year 2015 which accepted to survey 293 firms. The registered mail had been sent to manufacturing industries in Thailand. The queries base on literature review.

The first section of survey questions aims to collect the demographic data of manufacturing industries in Thailand. That included manufacturing product type, year of entry to the market; also the instrument questions were 4 items.

The second section collected the company representative's opinion as a user in various view follows hypotheses. The questions were comprised 2 groups were rate using 5 point Likert scale ranging from 1: strongly disagree to 5: strongly agree. Normally, a 5 point Likert scale has been surveyed to achieve higher statistical variability among response (Tsai *et al*., 2012). Next, Likert-scale had been extended of agreement the statement and interpretation. This section has 4 items.

The first element was an instrument the manager opinions in "The trusted point of the liberalization of international road freight transport services provider improve quality efficiency" which had been developed from literature reviews in RILS.

The second element collected the opinions in "The impact from the liberalization of International road freight transport services provider to quality efficiency". The instrument questions based on literature reviews 3 items.

After that, Multiple Regression Analysis (MRA) has been taken to test hypotheses. MRA is a statistical technique to analyze the relationship between a single dependent variable and several independent variables. The result of MRA will tell how well of independent variable explains dependent variable with $R^2$, the direction and size of the effect (Hair *et al*., 2010; Gujarati, 2003). It had been taken to analyze the relationship between international road freight transport provider and quality efficiency.

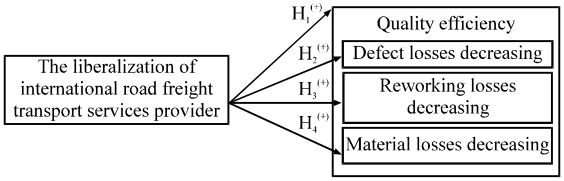


Fig. 2: Hypotheses model

**Hypotheses model:** The main research Hypothesis ($H_1$) was the liberalization of international road freight transport services provider positive impact to quality efficiency in manufacturing firms which had been shown in Fig. 2. The subordinated hypotheses can be shown as go behind:

- $H_2$: the liberalization of International road freight transport services provider positive impact to defect losses decreasing
- $H_3$: the liberalization of international road freight transport services provider positive impact to reworking losses decreasing
- $H_4$: the liberalization of international road freight transport services provider positive impact to material losses decreasing during production

## RESULTS AND DISCUSSION

**Respondent of sampling and firm characteristics:** Invitations to this survey participation were lettered to 293 firms in Thailand. Many of survey invitation were undeliverable because they went out of business and had an unfounded address, since this study surveyed during the political problem. A total come back 84 participants to rate of 28.66%; nonetheless, the responses 6 (2.04%) were uncompleted and removed. Then, the completed responses totaled 78 (26.62%) which were used to data analysis. Normally, the research study manufactures have a low response rate such as 24.24% is accepted (Biloslavo *et al*., 2013). The largest groups of industrial size were medium enterprises 66.6%, small enterprises 24.3% and large enterprises 8.9%. The largest groups of years of manufacturing were equal and <10 years 47.4%, 11-20 years 29.4% and >20 years 23%.

**Hypothesis testing by Multiple Regression Analysis (MRA):** Initially, hypothesis $H_1$ was the primary hypothesis for this study; however, it had been had to proof by $H_2$, $H_3$ and $H_4$ which were tested by MRA as pursue.

The testing results of $H_2$ infer that the liberalization of international road freight transport services provider is a significant predictorof increasing the defect losses decreasing (Adjusted $R^2$ = 0.096, t = 3.022, $\beta$ = 0.319,

$p<0.003$). It explains 9.6% of change in defect losses decreasing based on these results, the null hypothesis $H_{02}$ was rejected and the alternative hypothesis $H_2$ was accepted.

The testing results of $H_3$ infer that the liberalization of international road freight transport services provider is a significant predictor of increasing the reworking losses decreasing (Adjusted $R^2 = 0.089$, $t = 2.924$, $\beta = 0.337$, $p<0.005$). It explains 8.9% of change in reworking losses decreasing based on these results, the null hypothesis $H_{03}$ was rejected and the alternative hypothesis $H_3$ was accepted.

The testing results of $H_4$ infer that the liberalization of international road freight transport services provider is a significant predictor of increasing the material losses decreasing during production (Adjusted $R^2 = 0.116$, $t = 3.336$, $\beta = 0.383$, $p<0.001$). It explains 11.6% of change in material losses decreasing during production based on these results, the null hypothesis $H_{04}$ was rejected and the alternative hypothesis $H_4$ was accepted.

With the intention that the alternative hypothesis $H_2$, the alternative hypothesis $H_3$ and the alternative hypothesis $H_4$ were accepted. Based on these result, the null hypothesis $H_{01}$ was rejected and alternative hypothesis $H_1$ was accepted, plus it could be shown in Fig. 3.

Firstly, the liberalization of international road freight transport services provider positive impact to defect losses decreasing in manufacturing industries in Thailand. Secondly, the liberalization of international road freight transport services provider positive impact to reworking losses decreasing in manufacturing industries in Thailand. Thirdly, the liberalization of international road freight transport services provider positive impact to material losses decreasing during production decreasing in manufacturing industries in Thailand. As a final point, the liberalization of international road freight transport services provider positive impact to quality efficiency in manufacturing industries in Thailand.

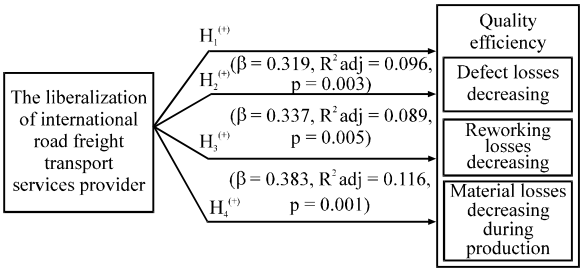


Fig. 3: Hypotheses tested result

## CONCLUSION

This school work is first investigating the liberalization of international road freight transport services provider impact to quality efficiency in manufacturing industries in Thailand. The finding results support the literature reviews that the liberalization of international road freight transport services provider positive impact to quality efficiency in manufacturing industries ($H_1$). The study suggests strategy to improve the operation both of manufacturing firms and logistics provider as lower.

Firstly, beverage firms will get hold of an incidence to take the better of international road freight transport services provider to develop their quality efficiency in addition which ease to reduce loss in defective product, reworking losses and material losses during production.

Secondly, this is an opportunity of international road freight transport services providers; they should particularly improve the road transferring services which are needed of quality efficiency in manufacturing industries in Thailand.

This study was only focused on manufacturing industries in Thailand; on the other hand, the manufacturing firms in another country may be different opinion. Then, the liberalization of international road freight transport services provider impact to quality efficiency in manufacturing industries in Thailand would be based to comparative with beverage firms outside Thailand.

## ACKNOWLEDGEMENT

Researchers are thankful to all of management representative of manufacturing industries in Thailand for offer the information to this research.

## REFERENCES

ASEAN, 2008. ASEAN Economic Community Blueprint. The ASEAN Secretariat, Jakarta, Indonesia, ISBN-13: 9789793496771, Pages: 56.

Anvari, F. and R. Edwards, 2011. Performance measurement based on a total quality approach. Int. J. Prod. Perform. Manage., 60: 512-528.

Bamber, C.J., P. Castka, J.M. Sharp and Y. Motara, 2003. Cross-functional team working for Overall Equipment Effectiveness (OEE). J. Qual. Mainten. Eng., 9: 223-238.

Bank of Thailand, 2015. The exporting value. Bank of Thailand.

Biloslavo, R., C. Bagnoli and R.R. Figelj, 2013. Managing dualities for efficiency and effectiveness of organisations. Ind. Ind. Manage. Data Syst., 113: 423-442.

Cherrett, T., J. Allen, F. McLeod, S. Maynard, A. Hickford and M. Browne, 2012. Understanding urban freight activity-key issues for freight planning. J. Transport Geograp., 24: 22-32.

DIWT., 2012. The factory attends the latency development project of waste utilization. http://www.induswaste.com/waste4546/download/project-2555.pdf.

Florian, M., J. Kemper, W. Sihn and B. Hellingrath, 2011. Concept of transport-oriented scheduling for reduction of inbound logistics traffic in the automotive industries. J. Manuf. Sci. Technol., 4: 252-257.

Gonzalez, A., 2002. Inbound logistics drives strong demand for transportation systems. Warehousing Manage., 9: 1-3.

Gujarati, D., 2003. Basic Econometrics. 4th Edn., McGraw-Hill, New York, USA., ISBN-10: 0072427922, pages: 192.

Hair, J.F., W.C. Black, B.J. Babin and R.E. Anderson, 2010. Multivariate Data Analysis: A Global Perspective. 7th Edn., Pearson Education Inc., Upper Saddle River, NJ., USA., ISBN-13: 9780135153093, Pages: 800.

Jeong, K. and D.T., Phillip, 2001. Operation Efficiency and Effectiveness measurement. Int. J. Oper. Prod. Manage., 21: 1404-1416.

Mathur, A., G.S. Dangayach, M.L. Mittal and M.K. Sharma, 2011. Performance measurement in automated manufacturing. Measur. Bus. Excel., 15: 77-91.

Nachiappan, R.M. and N. Anantharaman, 2006. Evaluation of Overall Line Effectiveness (OLE) in a continuous product line manufacturing system. J. Manufac. Technol. Manage., 17: 987-1008.

OSMEP., 2013. Annual report of small and medium enterprises 2011-2012. Office of Small and Medium Enterprise Enterprises Promotion of Thailand, Thailand.

Pourakbar, M., A. Sleptchenko and R. Dekker, 2009. The floating stock policy in fast moving consumer goods supply chains. Transp. Res. Part E: Log. Trans. Rev., 45: 39-49.

Tsai, M.C., K.H. Lai, A.E. Lloyd and H.J. Lin, 2012. The dark side of logistics outsourcing-Unraveling the potential risks leading to failed relationships. Trans. Res. Part E: Log. Trans. Rev., 48: 178-189.

Tsarouhas, P., 2007. Reviews and Case Studies: Implementation of total productive maintenance in food industry: A case study. J. Qual. Main. Eng., 13: 5-18.

Yamada, T., K. Imai, T. Nakamura and E. Taniguchi, 2011. A supply chain-transport supernetwork equilibrium model with the behaviour of freight carriers. Trans. Res. Part E: Log. Trans. Rev., 47: 887-907.