

The Casual Model Of Green Supply Chain Management Practices, Policy Implementation, And Sustainable Supply Chain Performance To Improve Business Performance Of Thailand Transportation Service Providers

Chalat Wongsanguan¹, Chattrarat Hotrawaisaya², Komson Sommanawat³

College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, Thailand
Email: chattrarat.ho@ssru.ac.th

ABSTRACT

The objectives of this research, therefore, are to 1) study the levels of green supply chain management practices (GSCMP), policy implementation (POI) sustainable supply chain performance (SSCP) and business performance (BUSP) of the transportation service business in Thailand, 2) Analyze the effect of GSCMP, POI, SSCP on BUSP, and 3) to study the guidelines to improve BUSP of Transportation Service Providers (TSPs) in Thailand. The study used quantitative method research. The sample was 340 TSPs in Thailand based on the sample size of not less than 20 times the variables in the research model, arisen from stratified sampling by area. The instruments used in the research were questionnaires and interview form. The statistics used for data analysis were frequency, percentage, mean, standard deviation, confirmative factor analysis and structural equation modeling, while content analysis was used for qualitative data. The findings revealed that the levels of GSCMP, POI, SSCP, and BUSP were at a high level. In addition, GSCMP and POI had a direct positive effect on SSCP and a positive indirect effect on BUSP. Besides, SSCP had a positive direct effect on BUSP. Such findings can be a guideline for TSPs to improve the operational performance. Government agencies, furthermore, can use the study results to formulate a policy for helping entrepreneurs. Academicians and interested people, moreover, can bring the research results to study and conduct further research.

Keywords: Green Supply Chain Management Practices, Policy Implementation, Sustainable Supply Chain Performance, Business Performance

INTRODUCTION

Now efficient logistics management is the basis for the continuous business growth (Berman, 2017). As a result, entrepreneurs have turned to employ more logistics service providers over the past decade, especially in the Asia-Pacific countries for effective transportation of goods (ChinaGoAboard, 2020). In addition, as the world enters the 21st century, there is a huge change in technology and economy. Accordingly, organizations start to create strengths and competitive advantages (Correia et al., 2020), for example, realizing the importance of environmental issues (Xu et al., 2020), especially transportation service providers (TSPs). They have begun to pay attention to

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environmentally friendly practices at every stage, starting from supplier selection, procurement, delivery, and reverse processes (Zhang, Zhang, & Cao, 2020), in line with a policy that focuses on preserving and restoring natural resource bases according to the 12th National Economic Development Plan (Office of the National Economic and Social Development Council, 2020).

Green supply chain management is of interest to both the public and private sectors in many countries, whether Thailand, trading partners or economic competitors. This can be seen in the application of Green supply chain management practices (GSCMP) and government policy implementation (POI) to reduce costs and increase sustainable supply chain performance (SSCP). When considering the way to promote and drive green logistics and supply chain management at the macro level, it found that countries have different strategies and forms of promotion and pushing (Department of Primary Industries and Mines, 2020). This reflects that Thai business entrepreneurs, especially TSPs, must be paid attention to green supply chain management and support for government environmental policies to meet the demand of current users and compete with competitors from foreign countries. This leads to SSCP and business performance (BUSP) improved, as revealed by Hotrawaisaya and Jermstittiparsert (2020). Such factors will help transport operators in Thailand to survive under the COVID-19 outbreak that has negatively impacted the growth of the global and Thailand logistics markets (The Customs Broker and Transportation Association of Thailand, 2020) and to sustain both social and environmental aspects (Department of Business Development, 2020).

From the above information, it can be seen that the Thailand TSPs are important to the country's economy. However, TSPs need to adapt themselves to cope with today's violent competition. Past studies have found that GSCMP (Golpîra et al., 2017; Martínez and Mathiyazhagan, 2020) and POI (Ostapenko, 2016; Yang et al., 2019; Rokonuzzaman, 2020) plays an important role in improving BUSP. Therefore, this research focuses on GSCMP and POI that can develop SSCP and lead to the improvement of BUSP of Thailand TSPs. The results of the research reflect effective corporate management based on environmental protection at all stages and activities within the supply chain, by which increasing a transportation management efficiency, building a business image, and improving good environmental performance will help the business grow, gain more profits, and increase market share. The above results can also create a competitive opportunity in the transport service business or other similar businesses in Thailand to be more effective.

LITERATURE REVIEW

Green Supply Chain Management Practices

Green Supply Chain Management Practices (GSCMP) refers to the practices that combine the concept of supply chain management with the concept of environmental management, involving in the relationship since the design process, raw material sourcing, production, packaging, storage, transportation, distribution, consumption, reuse, and disposal of goods. All processes must show awareness of environmental friendliness throughout the product lifecycle and focus on building green supply chain integration among suppliers, internal departments, and customers to create added value for efficient operations, obtain a competitive advantage, and reduce the environmental impact of the business in a sustainable way (Green et al., 2012; Teixeira et al., 2016). Namagembe (2019), Cousins et al. (2019), and Prachayapipat et al. (2020) found that the critical components of business enterprise GSCMP comprises internal environmental management, green purchasing, cooperation with customers, and eco-design.

Companies implementing GSCMP can build a good image of the business organization to society and increase the financial efficiency of the company, including maximizing social, economic, and environmental benefits (Martínez & Mathiyazhagan, 2020), while Zhang et al. (2020) found that GSCMP will result in the improvement of overall enterprises' performance throughout the supply chain, especially the environmental performance. In addition, Acquah et al. (2020) found that the enterprise's focus on GSCMP will result in operational improvements in marketing, financial, social, economic, and environmental operations. It is, therefore, hypothesized that:

Hypothesis 1: Green supply chain management practices have a positive direct effect on sustainable supply chain performance.

Policy Implementation

Perceived policy effectiveness is a perception of circumstances or external factors which leads to the assumption (Wan et al., 2014) on the ability of governments or other entities to carry out activities in accordance with policies (Wan et al., 2015), where effective government policy plays an important role in effective resource management. A study by Shaharudin et al. (2020) found that perceived policy effectiveness leads to policy implementation (POI) which is firm or individual performing various activities according to government policies, such as economic, social, environmental policies, etc. Hutahaen et al. (2017), Joo et al. (2018), Zhou and Cao (2019), Shaharudin et al. (2020) found that POI depends on three elements: public regulatory compliance (RC), use of public facility usage (FU), and public encouragement compliance (EC).

Rokonuzzaman (2020) demonstrates the influence of POI on non-profit market operations and financial performance in the short-term. However, these guidelines will help businesses to generate good long-term economic and social performance. In addition, Yang et al. (2019) found that the implementation of environmental policies will reflect that a business has social and environmental responsibility along with profitability and market expansion, while Ostapenko (2016) explains that POI influences business development, especially government policies related to supporting the quality of commercial services and infrastructure. It is, thus, hypothesized that:

Hypothesis 2: Policy implementation has a positive direct effect on sustainable supply chain performance.

Sustainable Supply Chain Performance

Sustainable Supply Chain Performance (SSCP) means that a business profits from the flow of a product or service from suppliers to end customers through all central entities along with the emphasis on environmental conservation (Mitra and Datta, 2014; Ahi and Searcy, 2015). Paulraj et al. (2017) and Baliga et al. (2019) depict that SSCP can be measured by economic performance (ECP), social performance (SOP), and Environmental Performance (ENP).

SSCP allows businesses to survive due to the sale growth and the continuous development of products and services plus it leads to more market shares and profits than competitors (Agyabeng-Mensah et al., 2020). In addition, Tran et al. (2020) found that sustainable transport management is very important since such factors positively influence a business performance in terms of finance and customer loyalty, while Weber (2017) found that sustainable business organization performance results in business plan accomplishment by helping the firm to serve customers quickly and efficiently. It is, hence, hypothesized that:

Hypothesis 3: Sustainable supply chain performance has a positive direct effect on business performance.

Business Performance

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Wu et al. (2015) defined Business Performance (BUSP) as an outcome measure of success, comprising productivity, profit, service quality, and customer or employee satisfaction. BUSP indicators, in addition, include employee safety, suitable rewarding, fair compensation, appropriate working environment, quality of work life in order to maintain motivation and build employee engagement with the organization (Lee et al., 2015). Kurniawan et al. (2020) has divided BUSP into two dimensions: Financial performance and non-financial performance, while this study divides BUSP into 3 dimensions based on the concepts of Simon et al. (2015), Al Issa (2020), Kurniawan et al. (2020), and Ilmudeen et al. (2020), consisting of financial achievement (FA), operational excellence (OE), and marketing performance (MP).

The relationships of GSCMP and POI on SSCP, including SSCP on BUSP, allow the study to consider mediation effects, as suggested by Hayes (2017), Phrapratanporn et al. (2019), and Aunyawong et al. (2020). The following hypotheses, therefore, are proposed:

Hypothesis 4: Sustainable supply chain performance positively mediates the effect of green supply chain management practices on business performance.

Hypothesis 5: Sustainable supply chain performance positively mediates the effect of policy implementation on business performance

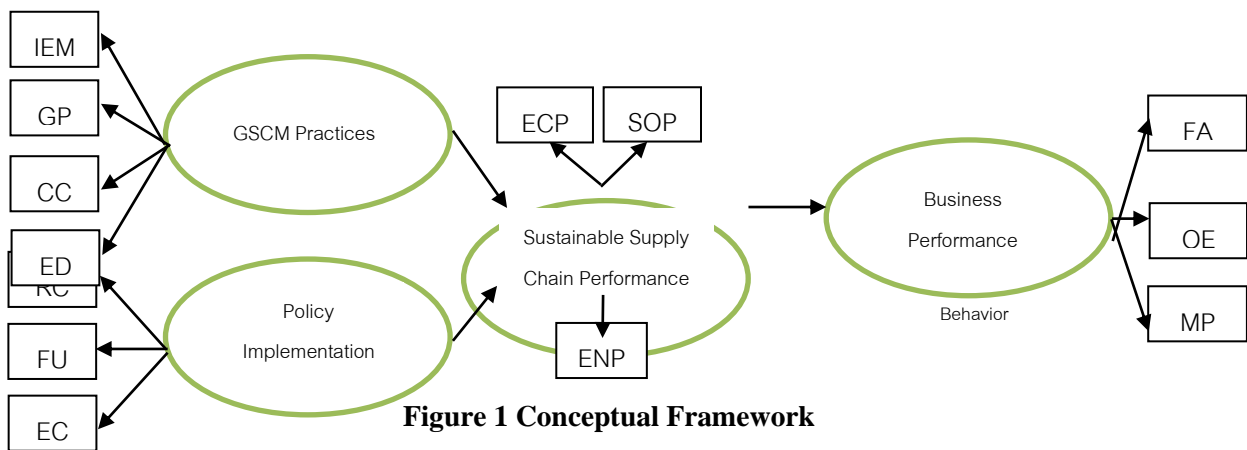


Figure 1 Conceptual Framework

METHODOLOGY

Population and Sample

The population was 20,285 TSPs in Thailand registered with the Ministry of Commerce (Trade Policy and Strategy Office, 2020). The sample consisted of 340 TSPs in Thailand, calculated from the sample size calculation according to the condition for using statistical analysis of the Structural Equation Modeling (SEM) was that the sample size was not less than 20 times the variables in the model (17x20) for greater reliability (Angsuchot et al., 2009). The sampling was done by stratified sampling by provincial areas.

Research Instrument

A questionnaire was an instrument used to collect data. The instrument accuracy was checked for validity and reliability. The validity consisted of content validity using IOC >0.5 (Petchrot & Chamniprasat, 2004) and construct validity using confirmatory factor analysis (CFA), while the reliability was checked for Cronbach's alpha coefficient >0.8 (Cronbach, 1990). For data interpretation, the researchers used 5-level Likert scale to interpret the meaning of the average score. The criteria for determining the weight of the assessment used a formula recommended by (Best and Kahn, 2006).

Data analysis

First, demographic characteristics survey and the level of variables in the research were analyzed using descriptive statistics, including percentage, mean, standard deviation, Skewness (Sk), and Kurtosis (Ku) to measure the normal distribution of data in the analysis of SEM. Second, discriminant validity was tested based on Maximum Shared Variance (MSV) < Average Variance Extracted (AVE) and Average Squared Shared Variance (ASV) < AVE; Also, the latent variable's AVE should be greater than the squared correlation between the latent variable and all other variables. In addition, the convergent validity was tested taking into account that the composite reliability value must be greater than 0.7 and AVE > 0.5 (Fornell & Larcker, 1981). Third, CFA was used to check the construct validity of the questionnaire. Forth, direct and indirect effects between latent variables used path analysis to examine the research hypotheses. Fifth, SEM used model fit indicators as proposed by Diamantopoulos and Siguaw (2000).

RESULTS

Testing Results of Measurement Model

The results showed that the observed variables averaged between 4.00 – 4.45, which was at a high level and had a standard deviation between .53 and .72, by considering the skewness with values between -3 and +3 and kurtosis of < 8 indicating a normal distribution (Kline, 2005). The factor loadings of all variables were positive and significantly different from zero at the .001 level. The variable with the most factor loading was marketing performance (MP) with a factor loading of .94 and the variable with the least factor loading was cooperation with customers (CC) with a factor loading of .673. In addition, R² was from .453 to .873, as shown in Table 1.

Table 1 Testing Results of Measurement Model

Variable	χ^2	S.D.	Remark	Sk	Ku	b	β	S.E.	t	R ²
GSCMP	4.33	.09	High	-	-	-	-	-	-	-
IEM	4.30	.64	High	-.885	1.517	.893	.805	0.048	18.582***	.649
GP	4.23	.64	High	-.874	1.366	1.000	.891	<- ->	<- ->	.793
CC	4.45	.55	High	-.903	.493	.640	.673	0.046	13.976***	.453
ED	4.32	.59	High	-.634	.332	.792	.762	0.051	15.446***	.580
POI	4.18	.08	High	-	-	-	-	-	-	-
RC	4.27	.53	High	-.395	.338	.733	.867	0.037	19.724***	.751
FU	4.14	.68	High	-1.168	2.727	.926	.842	0.040	23.217***	.708
EC	4.13	.72	High	-.952	1.278	1.000	.864	<- ->	<- ->	.747
SSCP	4.22	.01	High	-	-	-	-	-	-	-
ECP	4.22	.66	High	-.742	.551	.987	.754	0.061	15.908***	.568
SOP	4.22	.57	High	-.525	.174	.812	.712	0.049	16.551***	.507
ENP	4.23	.60	High	-.828	.738	1.000	.838	<- ->	<- ->	.702
BUSP	4.12	.11	High	-	-	-	-	-	-	-
FA	4.22	.60	High	-.400	.676	.940	.878	0.044	21.490***	.771
OE	4.00	.63	High	-.454	.467	.977	.854	0.043	22.975***	.729
MP	4.14	.60	High	-.580	.711	1.000	.934	<- ->	<- ->	.873

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Path Analysis Results

The results of checking the structural validity of the model by analyzing the structural equation revealed that the model was consistent with the empirical data since it depicted that Chi-Square (CMIN) = 69.532, df = 44, p-value = .058, $\chi^2/df = 1.580$, GFI = .972, AGFI = .942, TLI = .989, CFI = .994. , RMSEA = .007, RMR = .041, so it indicated that the model had construct validity. As a result, H1-H5 was accepted with statistical significance at the .001 level, by which GSCMP had a positive direct effect on SSCP, with the effect size of .624, POI had a direct effect on SSCP, with the effect size of 358, SSCP had a positive direct effect on BUSP, with the effect size of .945, GSCMP had an indirect effect on BUSP, with a SSCP mediation effect size of .590, and POI had an indirect effect on BUSP SSCP mediation effect size of .338. Moreover, GSCMP and POI predicted SSCP together by 90.4 percent and SSCP predicted BUSP by 89.3%, as shown in Figure 2 and Table 2.

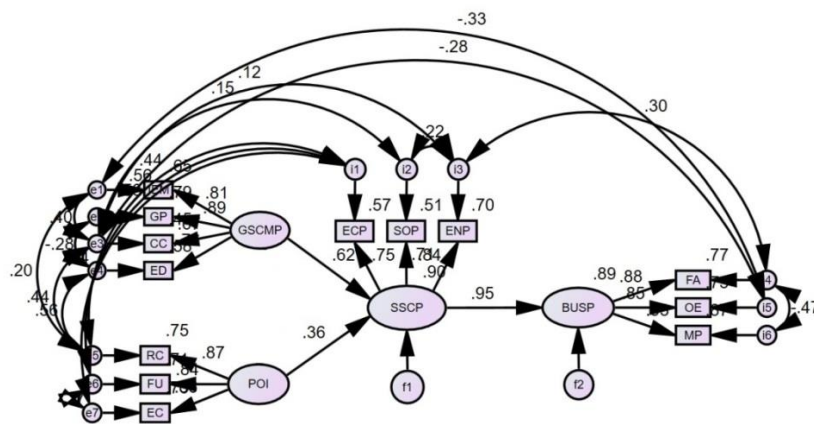


Figure 2 Structural Equation Modeling

Table 2 Path analysis results

H	Independent Variable	Mediating Variable	Dependent Variable	β	p-value	S.E.	t-value (C.R.)	R ²
H1	GSCMP	-	SSCP	.624	.000	.076	7.158	.904
H2	POI	-	SSCP	.358	.000	.066	4.375	.904
H3	SSCP	-	BUSP	.945	.000	.051	20.592	.893
H4	GSCMP	SSCP	BUSP	.590	.000	-	-	-
H5	POI	SSCP	BUSP	.338	.000	-	-	-

CONCLUSION AND DISCUSSION

The findings reveal that first, green supply chain management practices have a positive direct effect on the sustainable supply chain performance, consistent with Martínez and Mathiyazhagan (2020), Zhang et al. (2020), Acquah et al., (2020). Second, policy implementation has a positive direct effect on sustainable supply chain performance, in accordance with the Rokonuzzaman (2020), Yang et al. (2019), and Ostapenko (2016). Third, sustainable supply chain performance has a positive direct effect on business performance, compliant with the Agyabeng-Mensah et al. (2020), Tran et al. (2020), and Weber (2017). Forth, green supply chain management practices and policy implementation have a positive indirect effect on business performance through the mediation effect of sustainable supply chain performance, in line Hayes (2017), Phrapratanporn et al. (2019), and Aunyawong et al. (2020).

The study recommends that government or relevant government agencies should jointly provide training to transport service providers on green supply chain management and implementation of government policies because when entrepreneurs have more such knowledge, it will lead to improvements in sustainable supply chain performance and better business performance. The public sector, besides, should co-invest with private entrepreneurs who need capital assistance. This will also promote the stable country's economy. The further research should study other factors affecting green supply chain management practices, for example, stakeholder pressure and corporate green resources.

ACKNOWLEDGEMENT

Chattrarat Hotrawaisaya, the researcher of Suan Sunandha Rajabhat Univeristy, Thailand is the corresponding author.

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