

# Role of Pressures and Green Supply Chain Management Practices in Enhancing the Operational Efficiency of Firms: Evidence from Thailand

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**Abstract-** The environmental challenges for business are on rise. Bearing this fact in mind current has explored the relationship between different pressures and green supply chain management practices (GSCMP). In addition, current study has considered the GSCMP as a mediator. 220 respondents participated in the study and Smart-PLS was used for data analysis. Results revealed positive link between coercive, normative, mimetic pressure and GSCMP. Furthermore, the study also revealed that GSCMP significantly and positively mediates the relationship between coercive, normative, mimetic pressure and operational efficiency. The study concluded that when an organization is forced through the external sources such as legislation, environment protection agencies and customers they tend to follow the GSCMP. These practices in turn lead towards the operational efficiency of the firms. The limitations and future research areas are provided in the study.

**Keywords:** External pressure, coercive, normative, customer pressure, supply chain, green, efficiency, production efficiency, operational efficiency

## 1. INTRODUCTION

Supply chain fundamental and important functions of any organization. Over the years it has went beyond from its primary and sole focus on increasing the financial and operational performance only. Now it has started to consider the organizational sustainability as an important facet to be covered in organizational operations. Nowadays supply chain management has shifted its focus towards integration among environmental economic and social performance. Thus leading towards the green supply chain management (GSCM). Over the years the sustainability has emerged to be an important direction among the supply chain practices. Ref. [1] refers a greater

attention has been given to this phenomenon in the recent 20 years [1]. Regarding the emergence of green supply chain management Mumtaz, et al. [2] argued that as the environmental challenges are increasing, pressure to deal with them and having optimal financial performance shifted the focus from supply chain management (SCM) to GSCM. It has emerged to a strategic orientation, which can contribute towards the sustainability.

Sustainability in supply chain management (SCM) has become a widely researched topic in the recent decade. It also serves as a major challenge for the organizations [3]. Organizations are pressured to adopt the GSCMP in different ways such as customer awareness and regulatory institutions. ISO 14001 is an example of institutional pressure for adopting the practices, which contribute towards the environment sustainability. Empirical evidence is available on the environmental sustainability, which states that the firms, society and government all are the key interested party regarding the firm's impact on the environment. Which affirms that they can put pressure on the firm to improve its performance. Besides this fact that greater attention has been by organizations to improve their performance and reduce their impact on the environment, there are only few studies which have considered the external pressures as a key predictor for the supply chain management practices [4]. Therefore, this study will address this theoretical gap and provide valuable contribution in the literature on the relationship between external pressure and GSCMP.

The environmental issues are rising and one of them is the depleting resources, which has challenged the firms in the recent years. There are significant risks associated with the organizational processes which results in CO<sup>2</sup> emissions etc. Industrial sector is significant contributor in

pollutants and toxic materials [5]. These issues have resulted in increased focus on the GSCMP. These practices which are adopted in an answer to meet with the environmental challenges can lead towards the increased market share and profits [6]. There is public and government pressure to adopt the GSCMP to reduce the impact of an organization on the environment [7].

Organizations are facing the challenge to meet the environmental needs and they want their profits to be maximum as well. So there is need to integrate the green concept with the profits maximization. Thus, this study will provide insights how the organizations are pressured to implement the green concept in their processes. Further, it will also highlight that how the GSCMP do contribute towards the operational efficiency of an organization. Present study will point the different pressures, which lead towards the adoption of sustainable practices in business doings. The following sections of the study will provide details about the literature, methods adopted for the study, findings and conclusion.

## 2. Literature Review

This section shows the literature regarding the under study variables and literature on the links between the variables.

### 2.1. Operational Efficiency

Operational efficiency denotes the overall how much the processes of the organization are efficient. It is an important factor, which can be used to assess and evaluate the firm performance in multiple contexts. A firm may be efficient in its service delivery, production process, marketing and customer grievance handling etc. Present study has operationalized the operational efficiency in the context of total quality management which is primarily focused on improving the product quality [8]. Which asserts that more the organizational processes are smooth and refined the more will the improved product quality. The other context for the operational efficiency measurement is the just-in-time approach, which is focused on the wastes reduction. Thai and Jie [9], in their study reported a significant positive association between total quality management and SCM. Therefore, it establish that there are different forms and perspective to measure and assess the operational efficiency of a firm.

### 2.2. Green Supply Chain Management Practices

GSCMP have been defined by various researchers. It is basically the extension of the SCM which considers environmental issues in the

organizations' operations [10]. Similarly it has been argued that SCM "links operations to source and provide goods and services to the end users" [11]. GSCMP can be described as "the practice of improving environmental performance along the supply chain, including product design, operations management, and customer relationships" [12]. Further, it was argued that GSCM consists of different approaches and activities, which can be used by an organization to improve and maintain the performance of its processes or products/services. It is multi-focus technique which deals integrates the environment and financial concerns between suppliers and end-users [13]. Many of the studies that are conducted on GSCM which reflects the importance and greater attention being paid to this topic [14]. Furthermore Jia and Wang [15] argued that it can be regarded as a modern tool for environmental management which incorporates the awareness about the environment and pin point the wise resource usage by the organizations in their supply chain. It's a process in which environment friendly practices are incorporated within the domain of the supply chains of the firms.

### 2.3. Institutional Pressures

Nowadays organizations take different steps in order to reduce their negative impact on the environment due to the production of goods or delivery of services. In this regard, actions at personal level cannot help to accomplish the desired objectives. It affirms the need for collective efforts. According to the institutional theory an organization go for the sustainable practices in supply chain due to the following reasons: law enforcement, levies and penalties which are entitled under the industrial bodies; by provision of inducement for the adoption of best practices regarding the environment and society [4]. From the above-mentioned reasons, it is evident that the pressure by the institutions acts significantly in adoption of GSCMP. Present study has considered coercive, normative and mimetic pressure as a predictor for the GSCMP.

*Coercive pressure* "stems from the political influences in both the formal and informal pressures and the problem of legitimacy. Coercive forces result from other organizations on which the institution is dependent (e.g. governmental agencies, headquarters, and important clients) and cultural expectations in the society where it functions (e.g. legislation and societal norms on corporate governance, stakeholder management and the imposition of standard operating practices)" [16]. It is also termed as regulation and incentive, which is defined as law, benchmarks and regulation. These are also inclusive of compulsion and stimulus elements, which are usually put

forward by the governments, companies' headquarters, external governments or organizations working at international level. These can force a firm to go for the GSCMP [4].

*Normative pressure* "stems from professionalism and expectations regarding how work should be conducted professionally. Some occupations have established organizations that control or affect their profession by defining entry to the field and setting enforceable norms to which professionals must comply" [16].

*Mimetic pressure* "stems from uncertainty. It is a power that encourages imitation. Under conditions of uncertainty, managers look towards other organizations when designing their structures and processes. It occurs when organizations are uncertain about business prospects, goal ambiguity or a poor understanding of organizational technologies, environment creates symbolic uncertainty" [16].

Institutional pressures are significant predictors for the GSCMP as when an organization wants to save itself from the statutory actions it must have to obey the directives and policies formed for environment protection. Thus resulting in adoption of GSCMP in their business operations. These steps include the reduction of wastes, disposals of wastes, treatment of contaminated water and CO<sub>2</sub> emission etc. [10].

#### 2.4. Coercive Pressure and Green Supply Chain Management Practices

Coercive pressure acts significantly in the process to take decisions which involves the utilization of raw material for production of products, from whom these will be purchased as there are certain regulatory restrictions in developed countries [17]. Moreover, Hanim, et al. [4] conducted a study by collecting data from 132 firms in Malaysia which are EMS ISO 14001 certified. The results enlightened that the regulations lead towards the improved environmental performance of firms. According to regulations usually serves and regarded as a source of pressure from the external organizational environment, which contribute towards the implementation of GSCMP. It is regarded as a vital factor, which can drive the positive practices in an organizational operations and practices to manage the environment. Interest in environment protection is increasing rapidly. In this regard regulatory institutions such as United Nations and European Union etc. are establishing many directives for environment protection. When the organizations fail to implement/follow the special directives for environment management they can face the penalties established [18]. Hence, it is hypothesized that:

**H1:** *Coercive pressure and green supply chain management practices are significantly related.*

#### 2.5. Normative Pressure and Green Supply Chain Management Practices

Normative pressures also lead towards the GSCMP adoption. Such pressures can be built by the company end-users, civil society and non-profit organizations as well [19]. Further, it was also argued that these pressures regarded as the key predictor for the GSCMP adoption especially in developing countries. These normally put upon the organization by the end-users and dealers as they have good interpersonal relationships in the developed countries [20]. In this regard Hanim, et al. [4] collected data from 132 manufacturing firms in Malaysia and reported that customers pressure on the firm lead it towards the eco-design and improved environmental performance. Hence, it is hypothesized that:

**H2:** *Normative pressure and green supply chain management practices are significantly related.*

#### 2.6. Memetic Pressure and Green Supply Chain Management Practices

Memetic pressures involves the repetition of the successful practices in the industry. The benchmarked organizations as source for the practices adoption. The firms can borrow the benchmarked organizations' practices for their own application purpose. It is not a forced rather it is the self-step of any manager running in an organization. When someone sees the other organizations are doing well, it generates a desire to follow that particular successful practices for the success of the organization [18]. Therefore, when a manager finds some good practices of GSCM in any firm he/she will tend to apply those practices in his/her organization. Thus, it is hypothesized that (Hussain, Salem, Rashid, & Kamarudin, 2019):

**H3:** *Mimetic pressure and green supply chain management practices are significantly related.*

#### 2.7. Green Supply Chain Management Practices and Operational Efficiency

GSCMP are inclusive of using products, their production and their delivery to end-user as well. Similarly, the environmental awareness is a vital aspect in the GSCMP adoption, which also lead towards the effective and efficient purchase of goods and raw material. In addition it was argued that GSCMP lead towards the improved organizational performance [21].

Implementing the sustainable practices in supply chain reduces the wastes, results in better procurement and integrates all the members of supply chain on one agenda, which is environmental protection. Studies have revealed that these practices lead towards the better performance by improving the operational

efficiency of the firms [22]. These practices not only improve the environment performance but also do contribute significantly towards the high financial performance and sales growth as well [15]. Furthermore Ali, et al. [10] argued that organizations want to improve their performance and they depend on certain resources in supply chain relationships between units and organizations. In this regard it was argued that total quality management and just-in-time etc. are the techniques which do improve the organizational performance [23]. TQM ensures the optimal resource usage while JIT ensures the less waste and combined both of them adds to the green supply chain performance, which ultimately improves the operational efficiency: Therefore, it is hypothesized that:

**H4:** *Green supply chain management practices are significantly related to the operational efficiency.*

## 2.8. Green Supply Chain Management Practices as a Mediator

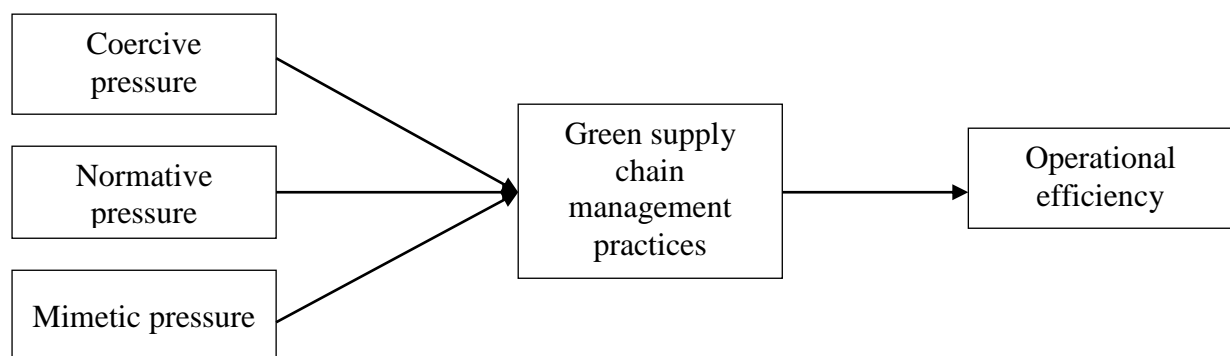
The above-mentioned literature has clearly stated that there is relationship between the institutional pressures and GSCMP. Hanim, et al. [4], reported a positive relationship between coercive, normative pressure and green supply chain management

practices. Furthermore, Yang [18], contended that when organizations are bound to the national and international environmental directives they are pressured to go for adopting the green supply chain management practices. Similarly, Saed, et al. [20], contended that the customers' awareness on the environment puts pressure on the organization to adopt the green practices in its operations which lead towards the GSCMP. Yang [18], also contended that when there is a successful benchmark regarding the business process other will follow it get success. The resources depletion pin points that organizations must use the GSCMP to better utilize the resources. According to Albino, et al. [21], when organizations develops concerns regarding their impact on the environment in terms of wastes etc. their operational efficiency tends to increase. Therefore, following are the hypothesis and theoretical framework for the study:

**H1a:** *Green supply chain management practices are significant mediator between coercive pressure and operational efficiency.*

**H2a:** *Green supply chain management practices are significant mediator between normative pressure and operational efficiency.*

**H3a:** *Green supply chain management practices are significant mediator between mimetic pressure and operational efficiency.*



**Figure 2.** Research Framework

## 3. Methodology

The purpose of current study is to examine how the external pressures influence the GSCMP which in turn lead towards the operational efficiency of a firm. The study was conducted in the auto parts manufacturing industry in Thailand. It is one of the major sector in Thailand with 12% contribution in GDP which makes it an important sector to be studied. There are different techniques available to select sample size namely; Krejcie and Morgan [24] table for sample size, Barlett, et al. [25] suggested that the sample size should be at least 20% of the population, Oke, et al. [26] proposed that sample size should be 200 to 400 for developing structural equation modeling. Almost

according to all the criteria 300 is the appropriate sample size for the present study (LeRoy, 2018).

The next step was to design a measuring instrument which contained two sections one is demographic section and other one is the variables questions related section. Demographic section consisted upon the questions related to the personal profile of respondents such as gender, age, education, and experience. The later section consisted upon the questions related to the variables namely; coercive, normative and mimetic pressure, GSCMP and operational efficiency [31]. All the measures were adopted from the previous studies the details of which are as follows: GSCMP was measured by 23 items, operational efficiency was measured with 6 items scale [27], coercive pressure, normative pressure and mimetic pressure was measured by

adopting 6, 7 and 3 items scale respectively [28]. After data collection 220 questionnaires were found to be valid and used for data analysis.

#### 4. Results

Smart-PLS has been used for data analysis in this study. Following section will present the results of the study. Convergent validity was assessed with the PLS-algorithm. Convergent validity makes sure that each item in the measure is measuring its own

variable and not the other variables. There are four parameters for the convergent validity namely; factor loadings, average variance extracted (AVE), composite reliability (CR) and Cronbach's Alpha (Hair et al., 2010). If these four criteria are full filled then no problem with convergent validity of the items used in the study. The thumb rules is the value of factor loading and AVE should be greater than 0.50 while the value of Cronbach's Alpha and CR should be greater than 0.70.

**Table 1.** Confirmatory factor analysis

Constructs	Items	Loadings	Alpha	AVE	CR
Coercive Pressure	CP1	0.778	0.868	0.655	0.904
	CP2	0.806			
	CP3	0.814			
	CP4	0.841			
	CP5	0.805			
Normative Pressure	NP2	0.828	0.885	0.503	0.908
	NP3	0.853			
	NP5	0.726			
	NP6	0.759			
Mimetic Pressure	MP1	0.829	0.84	0.676	0.893
	MP2	0.797			
	MP3	0.838			
	MP4	0.836			
	NP1	0.818			
Green Supply Chain Management Practices	GSCMP1	0.696	0.861	0.641	0.899
	GSCMP3	0.667			
	GSCMP7	0.373			
	GSCMP8	0.744			
	GSCMP10	0.756			
	GSCMP11	0.800			
	GSCMP12	0.790			
	GSCMP13	0.759			
	GSCMP15	0.722			
GSCMP16	0.686				
Operational Efficiency	OE1	0.802	0.849	0.688	0.898
	OE2	0.840			
	OE3	0.846			
	OE4	0.831			

Table 1 is representing the values for 'factor loadings, average variance extracted and composite reliability'. The values for all the factors loadings are greater than 0.5, which ensures that one parameter has been satisfied. The value for average variance extracted for all the variables is more than 0.5 and the value for composite reliability for all

the variables is more than 0.8. Barclay, et al. [29], reported that the values for composite reliability and average variance extracted must be greater than 0.8 and 0.5. All the values are denoting that the parameters for the convergent validity has been satisfied. Below figure 3 is showing the factor loadings for the research model.

#### 4.1. Discriminant Validity

The next test for validity is to measure the discriminant validity. It measure that to what degree measure as a whole do not reflect the other variables. "Fornell-Larcker Criterion" is the old technique for discriminant validity according to which the correlation of variable with itself must be

greater than other variables. Whereas a latest technique is being used by researchers "HTMT (Hetrotrait-Monotrait Ration)". According to this technique all the correlation values must be less than 0.85. Below table 2 is denoting the values for discriminant validity and as per the table values are below 0.85 it establishes discriminant validity.

**Table 2.** Discriminant validity

	CP	GSCMP	MP	NP	OE
CP					
GSCMP	0.687				
MP	0.632	0.840			
NP	0.509	0.674	0.630		
OE	0.666	0.804	0.737	0.631	

#### 4.2. Structural Equation Modeling

After the convergent and discriminant validity is established the structural equation modeling as

used to test the hypothesized relationships of the study.

**Table 3.** Path coefficients

Hypothesis	beta	SD	T	P Values	Decision	R2	f2	VIF
CP -> GSCMP	0.219	0.026	8.471	p<0.05	Supported	0.673	0.099	1.483
CP -> OE	0.197	0.037	5.277	p<0.05	Supported	0.557	0.053	1.63
GSCMP -> OE	0.394	0.044	8.965	p<0.05	Supported		0.115	3.057
MP -> GSCMP	0.526	0.026	20.312	p<0.05	Supported		0.498	1.698
MP -> OE	0.131	0.039	3.34	p<0.05	Supported		0.015	2.544
NP -> GSCMP	0.224	0.026	8.745	p<0.05	Supported		0.103	1.496
NP -> OE	0.152	0.036	4.237	p<0.05	Supported		0.032	1.65

Table 3 is showing the results for SEM. According to the table coercive pressure is significantly linked with green supply chain management practices and the relationship is valued at 0.219. The relationship direction is positive. It means that when there is more pressure from the regulatory bodies the organizations will tend to adopt the green supply chain management practices. Similarly, mimetic pressure and green supply chain management practices relationship is also positive and significant as well. The relationship is valued at 0.131. It means that 1% more mimetic pressure will results in 13% more adoption of green supply chain management practices. Furthermore the relationship between normative pressure and green

supply chain is 0.036. Which means that 1% change in normative pressure will bring 3% change in adoption of GSCMP. Furthermore the relationship value between green supply chain management and operational efficiency are also positively related. The positive relationship value is 0.394. It can be interpreted that with increase in adoption and application of green supply chain practices the operational efficiency also do increases significantly. All the relationships between the variable are significant and in positive direction. However the relationship between normative pressure and GSCMP was weak. All the hypothesis H1, H2, H3, H4 and H5 are supported and accepted.

**Table 4.** Specific indirect effects

	beta	SD	T	Decision
CP -> GSCMP -> OE	0.086	0.015	5.834	Supported
MP -> GSCMP -> OE	0.207	0.024	8.532	Supported
NP -> GSCMP -> OE	0.088	0.014	6.124	Supported

Table 4 is showing the mediation effects of the GSCM between relationships of the variables. Results are showing that GSCMP are a significant mediator between relationship of all pressure types (coercive pressure, normative pressure and normative pressure) and operational efficiency and the relationships are valued at 0.086, 0.207 and 0.088 respectively. All the values for beta are positive which indicates a positive mediator. All the mediation results are significant. Thus H1a, H2a and H3a are supported.

## 5. Discussion

Several global issues are present such as increasing global warming, increasing population and resource depletion, which has challenged the environment preservation. Scholar, industrialists and scientists are working together to find a solution. From business perspective, green concept integration in the supply chains is emerging in the business world. Firms are continuously asked to improve their environmental performance. With the growing importance of the pressure and the adoption of the green supply chain management practices current study was conducted to assess the impact of pressure and supply chain management practices. Further, how do the supply chain can improve the operational efficiency? The study is descriptive and quantitative in nature. The data were collected from 220 respondents and Smart-PLS used for data analysis.

Firms are adopting the environment friendly practices due to certain pressures, which come from different sources such as legislation, public, customers, suppliers and international environmental regulatory bodies. Having in mind the importance of the topic current study has hypothesized that coercive pressure and GSCMP are significantly related. These pressures stem from the law, legislation and bodies which regulate the business practices [30]. The results of the study has reported a positive relationship between coercive pressure and GSCMP. The relationship is significant. It assert that the compulsion on the adoption of green practices can lead organizations towards the adoption of green supply chain practices. Further study also hypothesized that normative pressure lead towards the green supply chain management practices. In this regard it was argued that as customers demand for the green products, the products which are made strictly in line with the environmental consideration then the organizations are forced by their end-user to follow the GSCMP [20]. The study has reported a positive significant relationship between the variables. Which establishes that the customers and society pressure can also lead an organization to adopt and follow the green practices in its operations.

Moreover the study also hypothesized that the mimetic pressure and green supply chain management practices are significant related. The study results have shown a positive significant relationship between mimetic pressure and GSCMP. Hypothesis H4 proposed that GSCMP are significantly related with the operational efficiency. The results also highlighted a significant positive relationship between variables. Thus all the direct hypothesis H1, H2, H3 and H4 are supported by the results. In addition, mediation role of green supply chain management practices has been supported by the results that asserts that green supply chain management practices carry forward the impact of external pressures towards the operational efficiency.

The study has made valuable contribution in theory. Even though still there is room for improvement. In future studies may consider the internal supply chain in relation to internal pressures. There should be a longitudinal study to measure the casual relationship at two point of times. Furthermore, a comparative study may be conducted to assess the same model in wholesales and manufacturers perspective. Conclusively this is one of the few studies that have paid attention towards the external pressures impact on the GSCMP.

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