

Does Green Supply Chain Management Influence to Suppliers' Performance? Mediating Role of Social Capital

Aimi Zulhazmi Abdul Rashid¹, Adel Ali Yassin Alzyoud², Fayeze Hamed Abdo Al Shdaifat³, Khairi Mohamed Omar⁴

¹Universiti Kuala Lumpur Business School, Malaysia

^{2,4}College of Administrative Sciences, Applied Science University, Kingdom of Bahrain

³College of Business, Al Ain University of Science and Technology, UAE

¹aimizulhazmi@unikl.edu.my

²adel.alzyoud@asu.edu.bh

³fayeze.alshdaifat@aau.ac.ae

⁴khairi.omar@asu.edu.bh

Abstract--- Present study is ascertain to elaborate the role of green supply chain management towards the suppliers' performance. Further, the role of social capital as a potential mediator is also explored in the Thai business to business (B2B) context. Data was collected by using the survey questionnaires. Different statistical tests for measurement model and hypothesis testing respectively. Findings highlighted that suppliers' performance both in environmental and operational terms improves due to the GSCM practices. Furthermore, it also appeared to be the major interpreter for the social capital (rationale and structural). In addition, results also supported the multidimensional impact of social capital on suppliers' performance. Lastly, both dimensions of the social capital proved to be significant mediator for the relationship between green supply chain management practices and suppliers' performance. This study comes with the valuable insights to develop understanding about the key role of green supply chain practice and social capital to enhance the suppliers' performance.

Keywords: Green supply chain, relational social capital, structural social capital, suppliers' performance.

1. Introduction

Organizations are now encountering various environmental issues such as climate change, green consumerism, and environmental regulations and they need to critically examine their supply chain routes. Moreover, firms have broad range of environmental risks that are related to supply chain

process [1]. Therefore, they have focused on green supply chain with more concentration on environmental audits and provide environmental support to their suppliers with environmental collaborations [2, 3].

Green practices have broadly adopted in all industries, hence, recent studies critically explored the crucial role of GSC practices to evaluate the performance outcomes [4]. Moreover, previous studies tested the direct link between green supply chain and performance [5] and ignored the mediating constructs that may intervene this association in an explaining way. Most of the previous studies focused to investigate the effect of GSCM practices on organizational overall performance while giving more concentration to the environmental performance. Thus, ignored to discuss the suppliers' performance that is also directly linked to green supply chain processes. Therefore, present study covers this gap as it attempts to explore the key role of green supply chain management towards suppliers' performance while concentrating on the mediating effect social capital at B2B firms in Thailand. Following research questions that are addressed in this study:

- What is the association between GSCM and suppliers' performance (environmental performance and operational performance)?

- What is the association between green supply chain management and social capital?
- What is the association between social capital (relational social capital and structural social capital) and suppliers' performance (environmental performance and operational performance)?
- Does social capital significantly mediate the association between GSCM and suppliers' performance (environmental performance and operational performance)?

Theoretical framework of this study is based on social capital theory [6] because this theory has been extensively used in previous studies of supply chain management [7, 8].

This study comes up with valuable contributions in theory and implications for practitioners as well. Firstly, it utilized social capital theory in explicit manners to check the association between GSCM practices and suppliers' performance. Secondly, it also enrich the body of knowledge regarding social capital as it is less studied topic in green supply chain literature [2]. Thus, it makes this study one of the first attempts which investigates the GSCM practices with social capital perspective. Furthermore, social capital is deemed as a key factor to connect and explain the association between green supply chain practices with performance. In addition, it further contributes in green supply chain by concentrating on the collaboration and monitoring aspects of green supply chain practices. It gives insight understanding about the crucial role of social capital to enhance the suppliers' performance.

2. Literature Review

2.1 Green Supply Chain Management (GSCM)

GSCM is referred as "a set of managerial practices that integrate environmental issues into supply chain management to ensure environmental compliance and to foster environmental capability of the entire supply chain" [3, 9, 10]. Previous studies characterized GSCM as green supply chain practices [11] and green purchasing [12]. Moreover, another study identified that GRCM included a broader perspective of practices such as internal environmental

management, environment friendly design practices, green purchasing and eco-friendly assistance in the domain of supply chain [13]. Furthermore, these practices are categorized in two complementary and distinctive approaches such as collaborative approach and monitoring approach [14]. Collaborative approach ask for the buyers' participation in their suppliers to boost up their green performance. This approach mainly focused to build suppliers' capabilities rather than to attain short-term goals [14]. It is inclusive of broad range of activities such as financial and technical assistance, experience and information sharing, education and training programs [13, 14]. Furthermore, monitoring approach encompasses the assessment of environmental performance of products delivered by suppliers, collecting and handling of suppliers' information, and designing the evaluation criteria for suppliers.

Meanwhile, another study conceptualized green supply chain as "green supply chain is a concept that combines green procurement, environmental management of manufacturing materials, environmental circulation, marketing, and reverse logistics" [15]. Similarly, another study by Zsidisin and Hendrick [16] defined it as "a set of SCM policies held, actions taken and relationships formed in response to concerns related to the natural environment with regard to the design, acquisition, production, distribution, use, re-use and disposal of the firm's goods and services".

2.2 Social Capital

Social capital has been considered as worthy asset that stems by easy access to available resources by utilizing social relationships [17]. Structural, cognitive and relational social capital were argued to be the three constituents of social capital [18]. Present study focused on two of them. Structural social capital is defined as network arrangement between actors to ensure them that who and how you have to reach to peoples. Likewise, relational social capital majorly emphasized partnership-based and long-lasting relationships that further translates into alliance, trust, reciprocity and respect over the time that eventually facilitates the organizational behaviors [4]. Relational social capital denotes

friendship, obligations, respect and trust in personal relations between actors [18].

2.3 GSCM and Social Capital

The management of green supply chain is basically a reciprocal and mutual program that need joint recognition and gratitude by all partners involved in supply chain processes. Meanwhile, partners of GSCM can share social and environmental goals with each other. As, GSCM always focus on frequent communication and sharing due to which partners have better and mutual understandings that ultimately strengthen the relationship between supply chain parties [19-21].

Furthermore, GSCM practices mainly concentrate on developing future capabilities with respect to management, product improvement and technology rather than developing current environment, cost, and quality [22, 23]. Due to these joint venture activities a broader scope of support, firms treat their suppliers as partners rather than as contractors or suppliers [24] hence, both parties more towards closer relationship. Moreover, suppliers perceive the organizational direct involvement and mutual activities such as technical guidelines, education and training programs as a source of long term bonding and commitment [24], thus, GSCM practices are the key source to enhance the social capital. In along with the above arguments, following hypotheses were proposed:

H1: Green supply chain management significantly and positively influence the relational social capital.

H2: Green supply chain management significantly and positively influence the structural social capital.

2.4 Social Capital and Suppliers' Performance

Present study proposed that social capital is a key predictor which influence the suppliers' performance (environmental and operational performance). The direction of the influence is positive. A study by Lee [4] also examined how do the relational and structural social capital influence suppliers' environmental and operational performance. Data were collected by 850 supplying firms located on Korea. Results enlightened that relational and

structural social capital both are significantly related to suppliers' performance. Moreover, when there is quality of long-term relationship with trust, suppliers seems to be involved in new idea generation to resolve challenges that will ultimately lead towards the improved environmental and operational performance [4]. Similarly, another study also identified social capital is a key driver to adopt green supply chain practices. This study might be helpful to further examine the role of social capital to influence suppliers' performance [2, 25]. Furthermore, in social capital, firms have long term and quality of trust-based relationship with suppliers. These long term and trust worthy relationships with suppliers are able to enhance the suppliers' environmental capabilities, performance, and their commitment [26].

Besides this, previous studies found that social capital is the key factor for the operational performance [8]. Moreover, social exchange and relational social capital also facilitates to enhance the performance of supply chain [27] and improve overall performance in supplier and buyer relationship. In addition, relational social capital makes sure that buyers and their suppliers are engaged in value added activities and to increase their willingness to dig the new ideas and opportunities [28]. Previous studies highlighted that relational social capital is helpful to improve productivity, costing, quality, flexibility and performance [8].

Likewise, reciprocity, friendship, trust and respect between both parties (buyers and suppliers) also facilitates to improve the performance [29]. Additionally, social capital is fostered by trust, familiarities, shared information, joint problem solving, frequent communications and partnership that is helpful for supply chain partners for improved/extraordinary performance [30, 31]. A study by Lee [4] examined the effect of GSCM on suppliers' performance with mediating effect social capital. He collected data by supplying firms and his findings revealed that relational and structural social capital is significant mediator between relationship of green supply chain practices and suppliers' performance. Hence, based on the above arguments, it is proposed that relational social capital and structural social capital may influence the suppliers'

performance, thus, following hypotheses are proposed:

H3: Relational social capital significantly and positively related to suppliers' performance

H4: Structural social capital is significantly and positively related to suppliers' performance

H5: Relational social capital is significant mediator between association of GSCM and suppliers' performance

H6: Structural social capital is significant mediator between association of GSCM and supplier's performance

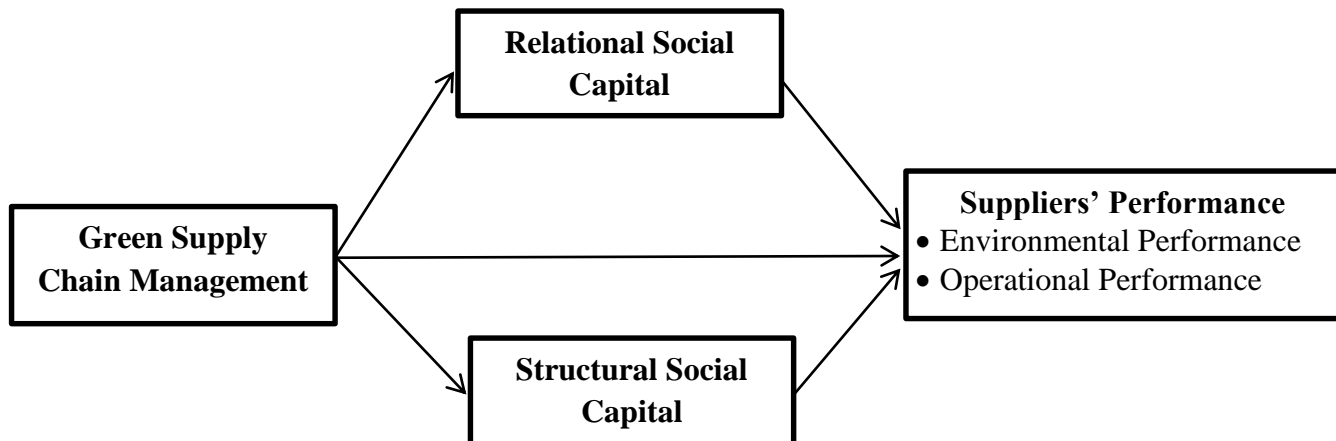


Figure 1: Theoretical Framework

3. Methodology

This section facilitates in describing the steps adopted to response the research questions. This section presents the roadmap to achieve study objectives. All methodological particulars such as target population, the sampling frame, research instruments, and data collection procedure are presented in this section. It is undertaken to investigate the role of GSCM on suppliers' performance with the mediating effect of relational and structural social capital. It is descriptive, quantitative and cross-section in nature. Survey method was employed for data collection. It is descriptive and quantitative. Questionnaire survey research procedure has been adopted to obtain responses.

3.1 Sample

The selected population of this study was B2B supplying firms located in Thailand. Sample size for this was 384 and 500 questionnaires distributed in selected firms. Data were collected by employing random sampling and by using personal administrated and postal survey.

3.2 Measures

All variables were measured using adapted instruments. This study used 5-point liker scale to measure all the constructs. A 7-items scale for GSCM is adapted that encompasses environmental performance and operational performance. Moreover, this study used two scales to measure relational and structural social capital. A 4-items scale was used to assess the relational social capital [8]. These four items represents to the joint problem solving, frequent information interactions and knowledge transfer. Moreover, four items scale was used to measure the structural social capital and that scale includes long term partnership, mutual trust, family atmosphere and mutual respect [28].

3.3 Data Collection Procedure

As unit of analysis for this was organization and data were collected by selected firms. Firstly, 500 supplying firms (B2B) were selected randomly and after that, questionnaires were sent to the selected organizations by using postal service and personal

administrated survey method was also used for data collection. A representative of firm from each organization as invited to participate in this survey. Out of 500 distributed questionnaires, only 471

questionnaires were sent back by that firms. After that, few questionnaire contained missing values and were incomplete, so total 374 questionnaire were used for data analysis.

Table 1. *Respondents' Profile*

Demographic Variables	Categories	Frequency	Percentage
Gender	Male	207	55.3
	Female	167	44.7
Age	Up to 25	93	24.9
	26-45	251	67.1
	46-55	30	8.0
	56+	---	---
Qualification	Bachelor's	279	74.6
	Master's	80	21.4
	others	9	2.4
Nature of Employment	Contractual	150	40.1
	Permanent	212	56.7
	Internee	12	3.2
Length of Service	Up to 1 Year	79	21.1
	2-5 Years	179	47.9
	5-10 Years	72	19.3
	10+ Years	44	11.8

4. Results

This study used SPSS for preliminary analysis and Smart PLS 3 for main findings.

4.1 Demographic Analysis

Demographic analysis encompasses the description of the characteristics of respondents. Table 1 revealed that out of 374 respondents, 55.3% (207) were male and 44.7% (167) were female. Survey reported that 24.9% (93) participants had their age up to 25 years. Moreover 67.1% (251) participants have age group of 26 to 45, and remaining 8% (30) respondents were between age group 46 to 55. Moreover, Table 1 also demonstrates demographic characteristics of survey participants in terms of their educational level. It is evident that 74.6% (279) of the respondents possessed the bachelor degree, 21.4% (80) participants hold the master's degree, and remaining

2.4% (9) of the respondents fall in 'others' category. Furthermore, Table 1 also showed that 40.1% (150) respondents enjoying their jobs with contractual nature while 56.7% (212) of participants have permanent jobs, and remaining 3.2% (12) respondents were internees. As shown in Table 1, analysis clarifies that 21.1% (79) participants carried up to 1 year length of service, 47.9% (179) participants had 2 to 5 years job experience, and 19.3% (72) participants had 5 to 10 years length of service and remaining 11.8% (44) participants showed more than 10 years' experience in selected organizations.

4.2 Descriptive Analysis

Table 2 highlighted the descriptive analysis and data normality. Mean of suppliers' performance, relational social capital, structural social capital and green supply chain management are 3.35, 3.37, 3.57, and

3.45 respectively. Moreover, data normality was assessed by using “skewness, kurtosis and histograms” (Munro, 2005). Scores of all under-study

constructs have normal distribution because all values of skewness and kurtosis were between -2 to +2.

Table 2: *Descriptive*

Variables	Mean	S.D	Skewness	Kurtosis
Suppliers' Performance	3.35	1.00	.90	-.51
Relational Social Capital	3.37	1.15	-.57	-1.18
Structural Social Capital	3.57	1.00	-.71	-.58
Green Supply Chain Management	3.45	1.25	-.65	-1.20

4.3 Measurement Model Assessment (CFA)

This study used PLS-SEM approach [32] that permits to estimate the measurement model and the structural model assessment (hypotheses testing). It used Smart PLS 3 [33] to perform these analysis. Table 3 signifies the results related to convergent validity. As recommended by Hair, et al. [32], this study used average variance extract (AVE), loadings, and composite reliability (CR) to evaluate the convergent validity. As recommended, $AVE > 0.50$, $CR > 0.70$ and loadings > 0.50 . As shown in Table 3 and Figure 2, results of measurement model are exceeded the recommended thresholds, that indicated that there is no issue of convergent validity.

4.4 Discriminant Validity

Discriminant validity means that predictors should not be highly correlated with each other. This study

used two methods to assess the discriminant validity: Fornell and Larcker, criterion and HTMT ratio. As stated by Fornell and Larcker [34], square root of AVE in diagonals should be higher than off-diagonal values (values in rows and columns). As shown in Table 4 and Table 5 that values of square root of AVE is higher than the rest of the values in rows and columns for 1st order constructs and 2nd order constructs respectively. These results proved that discriminant validity is established. Moreover, cross loadings were also shown in table 6 that also indicate that there is no issue regarding the discriminant validity of constructs.

“GSCM- Green Supply Chain Management; RSC- Relational Social Capital; SSC- Structural Social Capital; SP- Suppliers Performance”

Table 3. *Measurement Model Assessment*

1st Order Constructs	2nd Order Constructs	Items	Loadings	Alpha	CR	AVE
“Environmental Performance”		EP1	0.773	0.70	0.813	0.522
		EP2	0.741			
		EP3	0.683			
		EP4	0.689			
“Operational Performance”		OP1	0.756	0.701	0.810	0.517
		OP2	0.675			
		OP3	0.740			
		OP4	0.703			
	Suppliers' Performance	EP	0.801	0.721	0.756	0.607
		OP	0.757			

“Green Supply Chain Management”	GSCM1	0.669	0.773	0.837	0.424
	GSCM2	0.617			
	GSCM3	0.636			
	GSCM4	0.604			
	GSCM5	0.597			
	GSCM6	0.696			
	GSCM7	0.726			
“Relational Social Capital”	RSC1	0.782	0.728	0.829	0.549
	RSC2	0.751			
	RSC3	0.717			
“Structural Social Capital”	RSC4	0.711			
	SSC1	0.7	0.695	0.813	0.521
	SSC2	0.749			
	SSC3	0.723			
	SSC4	0.715			

Table 4. Discriminant Validity with Fornel Lacrker (1st Order Constructs)

	EP	GSCM	OP	RSC	SSC
EP	0.723				
GSCM	0.252	0.651			
OP	0.215	0.246	0.719		
RSC	0.307	0.130	0.206	0.741	
SSC	0.372	0.222	0.262	0.389	0.722

Note: “Diagonals (in bold) represent the square root of AVE while the other entries (off-diagonal) represent the correlation.”

Table 5. Discriminant Validity with Fornel Lacrker (2nd Order Constructs)

	GSCM	RSC	SSC	SP
GSCM	0.651			
RSC	0.130	0.741		
SSC	0.222	0.389	0.722	
SP	0.319	0.333	0.410	0.561

Note: “Diagonals (in bold) represent the square root of AVE while the other entries (off-diagonal) represent the correlation.”

Cross Loadings

Table 6. *Cross Loadings*

	EP	GSCM	OP	RSC	SSC
EP1	0.773	0.287	0.198	0.23	0.285
EP2	0.741	0.104	0.182	0.255	0.305
EP3	0.683	0.199	0.094	0.174	0.195
EP4	0.689	0.131	0.136	0.225	0.283
GSCM1	0.212	0.669	0.163	0.076	0.107
GSCM2	0.113	0.617	0.122	0.095	0.154
GSCM3	0.185	0.636	0.143	0.087	0.176
GSCM4	0.16	0.604	0.157	0.001	0.101
GSCM5	0.102	0.597	0.166	0.083	0.119
GSCM6	0.168	0.696	0.185	0.11	0.157
GSCM7	0.19	0.726	0.182	0.119	0.184
OP1	0.197	0.159	0.756	0.168	0.241
OP2	0.132	0.231	0.675	0.133	0.122
OP3	0.174	0.148	0.74	0.235	0.241
OP4	0.107	0.178	0.703	0.04	0.133
RSC1	0.193	0.108	0.222	0.782	0.253
RSC2	0.289	0.102	0.121	0.751	0.352
RSC3	0.24	0.066	0.162	0.717	0.288
RSC4	0.178	0.113	0.089	0.711	0.251
SSC1	0.23	0.193	0.132	0.279	0.70
SSC2	0.306	0.135	0.226	0.307	0.749
SSC3	0.273	0.143	0.228	0.293	0.723
SSC4	0.259	0.18	0.16	0.241	0.715

Besides this, a study by Henseler, et al. [35] presented another criterion to assess the discriminant validity and they claimed that Fornell Larcker approach did not spot the lack of discriminant validity in various research situations. Thus, they

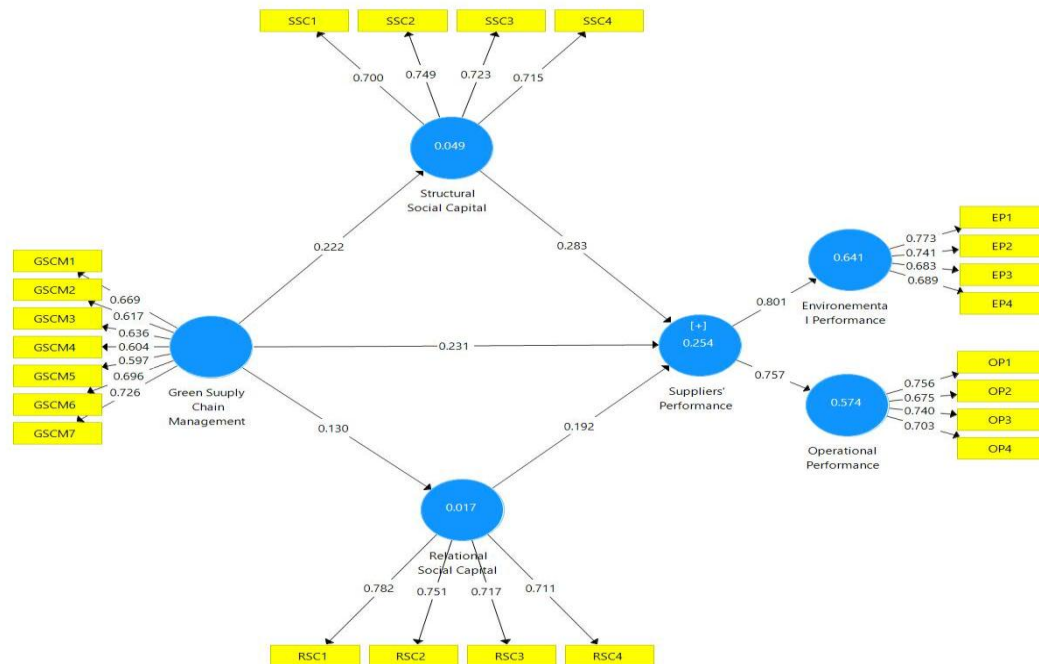
introduced an alternative approach, “the heterotrait-monotrait ratio of correlations”. Table 7 and Table 8 showed that all values of HTMT ratio are less than 0.85 that indicated that there is no issues of discriminant validity.

Table 7. *HTMT Ratio (1st Order Constructs)*

	EP	GSCM	OP	RSC	SSC
EP					
GSCM	0.336				
OP	0.301	0.34			
RSC	0.424	0.179	0.289		
SSC	0.527	0.302	0.365	0.54	

Table 8. *HHTT Ratio (2nd Order Constructs)*

	GSCM	RSC	SSC	SP
GSCM				
RSC	0.179			
SSC	0.302	0.54		
SP	0.436	0.461	0.576	

Figure 2: *Measurement Model Assessment*

4.5 Structural Equation Modeling

SEM was used to check the hypotheses. Table 8 showed the path analysis and findings proved that GSCM is positively related to relational social capital ($\beta = 0.130$, $t = 3.076$; $LL = 0.057$, $UL = 0.198$), thus H1 is supported. Moreover, it was found that GSCM has positive association with structural social capital ($\beta = 0.222$, $t = 5.210$; $LL = 0.138$, $UL = 0.285$), thereby H2 is also supported. Furthermore, results also depicted that relational social capital is positively related to suppliers' performance ($\beta = 0.192$, $t = 4.665$; $LL = 0.122$, $UL = 0.255$) and H3 is empirically supported. Refer to Table 8, structural social capital has significant and positive relationship with suppliers' performance ($\beta = 0.283$, $t = 6.208$; $LL = 0.198$, $UL = 0.351$) and H4 is also supported.

Moreover, table 9 indicated that indirect effects and results enlightened that relational social capital significantly mediated the link between GSCM and

suppliers' performance ($\beta = 0.025$, $t = 2.554$; $LL = 0.011$, $UL = 0.043$) and H5 is supported.

Table 8. *Path Analysis*

H	Relationships	B	S.D	t	LL	UL	Decision	R2	f2	Effect	VIF
H1	GSCM -> Relational Social Capital	0.130	0.042	3.076	0.057	0.198	Supported		0.017	Very Small	
H2	GSCM -> Structural Social Capital	0.222	0.043	5.210	0.138	0.285	Supported		0.052	Small	
H3	Relational Social Capital -> Suppliers' Performance	0.192	0.041	4.665	0.122	0.255	Supported	0.254	0.042	Small	1.181
H4	Structural Social Capital -> Suppliers' Performance	0.283	0.046	6.208	0.198	0.351	Supported		0.088	Small	1.221

Table 9. *Indirect Effects*

H	Relationships	B	S.D	t	LL	UL	Decision
H5	GSCM -> Relational Social Capital-> Suppliers' Performance	0.025	0.01	2.554	0.011	0.043	Supported
H6	GSCM -> Structural Social Capital-> Suppliers' Performance	0.063	0.017	3.67	0.035	0.089	Supported

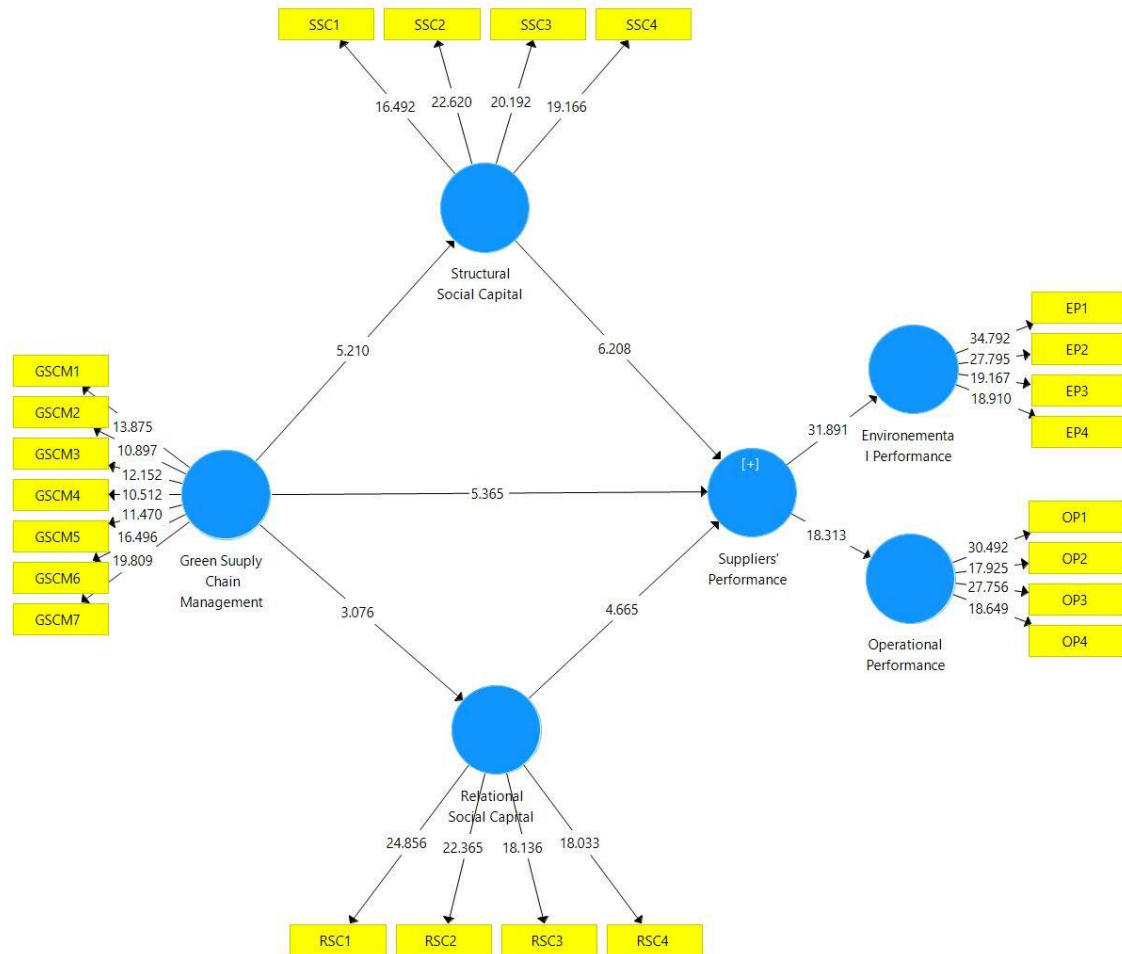


Figure 3: Structural Equation Modeling (SEM)

Furthermore, findings also depicted that structural social capital also significantly mediated the association between GSCM and suppliers' performance ($\beta = 0.0063$, $t = 3.670$; $LL = 0.035$, $UL = 0.089$) and H6 is supported.

5. Discussion and Conclusion

Present study was undertaken to check the effect of GSCM on supplier' performance through relational and structural social capital in supplying firms of Thailand. It was proved that GSCM is significantly related to relational and structural social capital, thereby H1 and H2 are supported. These findings are aligned with previous literature [4, 19, 22, 24]. Moreover, results of this study also highlighted that relational social capital and structural social capital are significantly related to suppliers' performance, thus, H3 and H4 were also empirically supported. These results are also aligned with previous studies. As a study by Lee [4] also reported that

social capital is considered as a key predictor for suppliers' performance.

Additionally, present study proved that relational and structural social capital significantly mediated the association between GSCM and suppliers' performance. This study gives insight understanding regarding the crucial role of GSCM and social capital to boost up the suppliers' performance. Moreover, social capital gives explanation that how GSCM can contribute in effective suppliers' performance (environmental and operational).

5.1 Theoretical Contribution

Present study has many contributions with theoretical perspectives. It enriched the body of knowledge regarding social capital as dearth of research was available on social capital in green supply chain literature [2]. This study is one of the first attempts to [36-38] investigate the GSCM with social capital perspective. Social capital is deemed as a key factor to connect and explain the

relationship between GSCM with performance. It gives insight understanding regarding the crucial part of social capital to enhance the suppliers' performance. Moreover, this study used social capital theory in explicit manners to investigate the relationship between GSCM and suppliers' performance. It further contributes in green supply chain by concentrating on the collaboration and monitoring aspects of GSC practices.

5.2 Limitations

Although present study has numerous contributes but few limitation are here that needs to be discussed in future studies. This study only focused on the suppliers' performance and ignored other aspects of performance. Further studies may integrate green supply chain practices with other dimensions of performance. Furthermore, this study only focused on the mediating role of social capital and ignored other factors that may explain the association between green supply chain and performance. Future studies may add different factors to explain this association in a clear way.

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