The Relationship Among the Green Supply Chain Management, Collaborative Capability and Organizational Performance

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Abstract

The study purpose is to investigate the mediating effect of collaborative capability (COC) in the relationship of supply chain management practices (SCMP) and organizational performance (OP) of food and beverages industry in Thailand. The data had collected from the 300 senior managers of food and beverages of Thailand. The Structural Equation Modeling (SEM) had shown that eco design (ECD) and investment recovery (IR) have positive and significant relationship with the environmental and financial performance. On the other hand, the indirect effect relationship had shown that COC is significantly and positive mediating in the association of the ECD and both organizational performance indicators. While COC had not significant mediating variable within the relationship of IR and both of OP indicators. These findings have shown that SCMP practices are important indicators for increasing their performance. Therefore, this study added empirical literature in the extant literature that could become a foundation for new research.

Introduction

Usually practices aimed for advancement of the environment related performance along the supply chain are regarded as green supply chain management (GSCM) inclusive of designing of products, operational management and relationships with customers (Srivastava, 2007; Chienwattanasook & Onputtha, 2022). Numerous studies have examined either the GSCM lead towards the improved firm performance or not (Fahimnia et al., 2015). Notably, Zhu et al. (2005) contended that the studies present mixed results which ranged from a minor to major progress. To elaborate the contradictory results, number of research scholars have examined factors which influence the relationships (Sarkis et al., 2011). As per previously inconsistent empirical evidence the present study intends to investigate the mediating effect of collaborative capability. Here, as per the previous studies (Zhu et al., 2012) collaborative capacity can be regarded as capability of an organization to influence other actors' knowledge and resources (Rai et al., 2006).

Collaboration associations facilitated the organizations in reducing their transactional costs. Further it facilitated creation of a sustained competitive position in unstable business environment (Sarkis et al., 2011). In recent times, numerous big organizations have started to grasp benefits of supply chain collaboration to implement the green strategies. Accordingly, Mishra et al. (2017) reported that Coca-Cola initiated widely ranged collaborative green practices such as Community Water Partnership. By ensuring the collaborative work with the bottling partners and environmental charities it has gained success in development of 1st decomposable plastic drink bottle plant. Besides, it also went into partnering with H.J. Heinz which utilizes Plant Bottle for its ketchup.

Green collaborative strategies are admired but little research evidence is available regarding the contribution of GSCM towards performance of an organization. Therefore, the study entertains the following research questions: a) is adoption of GSCM boots the firm performance? b) Do the collaboration level mediates

the association between GSCM and firm performance? These questions are answered by survey data collection from food and beverages industries Thailand. Reset of the research study is organized as follows: literature review presents a detailed literature on GSCM practices, collaborative capability in line with the natural resource based view (NRBV). Later on, conceptual framework, hypothesis, methods adopted, and results are presented. Finally, the last section of this research study contains the discussion, conclusion, and study limitations.

Literature Review

The natural resource based view (NRBV) and GSCM practices

Influence of GSCM on firms' performance is widely explained under resource-based view (RBV) (Balon et al., 2012). According to the theory organizations are asked to enhance their strategic resources and invest in them for sustained competitiveness (Cucciella et al., 2012). They may be tangible or intangible i.e., human, technology, and knowledge. According to theory resource must be exceptional, valued, and imperfectly imitable and cannot be substituted. Organizations with distinguishing competence with rare combinations of strategic assets can significantly accomplish the competitiveness over their competitors and enjoy the abnormal profits (Choi & Hwang, 2015).

Previously, a study (Hervani et al., 2005) made an attempt to extend the RBV scope by considering the limitations and prospects which are offered naturally by an environment. They presented a typology which later called as natural resource-based view (NRBV). It states that organizations can become competitive by implementing the green strategies i.e., pollution preventive measures, product stewardship, and sustained advancement. Preventing the pollution is aimed at to reduce the waste and radiations at start instead at end of pipe. Product stewardship makes sure the shared responsibility for reduction of environment related activities in a life cycle. Whereas sustainable development is not only the reduction of environmental damage rather it is also inclusive of social and economic concerns as well. Considerable research has investigated the competitive advantage of these strategies and their influence on pollution prevention (Hart & Dowell, 2011). For instance, a previous study reported

that technologies to prevent the pollution as compared to the controlling technologies are linked with increased firm performance (Vachon & Klassen, 2006). Accordingly, number of researchers have worked to elaborate NRBV and also presented evidence regarding its influence on the environmental practices which makes significant contribution towards performance of company (Cucciella et al., 2012).

Relation view and collaborative capability as a mediator

RBV is regarded as static in nature as it adopts the inward-looking view and makes assumption that organizations should acknowledge or have full control over their strategic resources aimed at to accomplish the sustained competitiveness. It further asserts that organizations are needed to build the barriers for the protection of their basic resources from being copied by their competitors. However, studies are increasingly questioning this assumption and also contending that SC resources do influence the performance of firm (Lee, 2008). Moreover, Priem and Butler (2001) contended that studies have not appraised RBV for remaining stuck in an internal environmental perspective. For addressing the theory related challenges, various academicians have attempted to reformulate RBV and argued that firm's competitiveness is outcome of resources but it is also dependent on the collaboration between the firms as well (Diabat & Govindan, 2011; Fang & Zhang, 2018). Similar, philosophy has also been applied by researchers in sustained environmental context (Dubey et al., 2015). Previously, Vachon and Klassen (2008) in their study reported that collective environment related practices with the suppliers lead towards the improved performance by employing the green oriented collaborative activities are associated with product based performance. Moreover, authors (Ibrahim et al., 2011) in their study put forward that knowledge creation through collaboration significantly play an important role in elimination of harmful material. Sharfman et al. (2009) in their study revealed that trust between the firms is among the leading factors influencing the degree to which an organization gets involved in cooperative GSCM. Considering the collaborative environment related activities and their influence on different actors revealed that collaborations which are widely spread prove to be beneficial for environmental performance of firms (Ahi & Searcy, 2013).

Previously conducted studies have made valuable contribution to advance the understanding about the significance of collaborations particularly in context of GSCM. Despite the valuable contribution, the differentiation between GSCM and collaborative practices of firm ability is not presented. Researchers are increasingly interested in studying the collaborative ability of firm and it is now regarded as a distinctive aspect (Balasubramanian, 2012). Numerous original equipment manufacturers employed asset recovery program for their end-of-life products (Toffel & Marshall, 2004). In line with NRBV, GSCM practices may be considered as strategic resources which directly improving the performance of firm. Notably, when it is talked about OEMs and their link SC, it emerges as a separate issue. It is to be noted that after starting the asset recovery program, there are only few OEMs which are not willing to collaborate with other actors of an organization (Toffel & Marshall, 2004). These can potentially lessen the loss happening at market and brand image. More importantly, such practice is not advised because it becomes difficult for an organization to hold all of the resources needed to implement GSCM (Choi & Hwang, 2015). Because, it is inclusive extensive activities which ask all SC participants to have know-how (Nakano & Hirao, 2011). Thus, the current study differentiates between collaborative capability of firm and GSCM. Further it also suggests that organizations having higher collaborative capability tend to outperform and better implement GSCM. Additionally, the study also emphasizes on organizational collaboration and partnership with actors such as suppliers, customers, public and private firms since working with such actors does not influence the performance of firm (Ahi & Searcy, 2013).

Hypotheses development

Conceptual framework is presented in figure 1 below. Based on NRBV, the study holds that GSCM, and firm performance have a positive relationship. Additionally, it also holds that collaborative capability is a mediator between the association of GSCM and firm performance. Previous studies have considered the GSCM around the firm-centered paradigm, particularly emphasizing on the activities related to environment lying within the organizational boundaries (Monczka et al., 2005). It is acknowledged that internal GSCM practices contribute towards the

improvement of firm performance. However, fully capturing GSCM practices ask for the consider commitment for the development of collaborative relations with external actors as well (Ahi & Searcy, 2013). Therefore, the present study emphasize on practices which are to be impacted by the collaborative capability of an organization: eco-design and asset repossession (Ort et al., 2011). According to Jia and Wang (2019) eco-design aims at reducing the harmful influence of environment of a product from its life cycle. Whereas later one is focused on the recovery of value from outdated, EOL and spare articles (Çankaya & Sezen, 2019).

The present study did not consider the internal environment related GSCM practices such as managerial commitment towards GSCM, and ISO 14001 certification because of less benefits of collaborators. Additionally, the study attempts to distinguish organizational collaborative ability from its GSCM. So, some of the external practices such as the collaboration with external partners for accomplishing the environment related goals are not included in the study. Notably, study utilizes two considerable indicators for firm's performance. Where the earlier indicator is environment related performance which can be termed as the ecological outcomes of an organization-wide devotion for the preservation and improvement of the natural environment (Nawrocka & Parker, 2009). Firms are increasing, who are devoted to the create value for society and environment. Therefore, the assessment of performance related to environment is becoming more popular and significant (Testa & Iraldo, 2010). Financial performance is the other indicator and numerous studies have shown that organizations who have good environmental performance tend to have good financial performance as well (Hu & Hsu, 2010).

GSCM practices and organizational performance

Various terms are used to define eco-design namely; green design, design for environment, and sustainable design, etc. (Luttropp & Lagerstedt, 2006). Regardless of term dispute, it is to be noted that eco-design strive for the creation of sustainable product by incorporation of environment related concerns along its life cycle starting from acquisition of raw material for production to disposing off (Çankaya & Sezen, 2019). Following are the few eco-design strategies:

- Utilizing the materials which can be renewed and recycled.
- Utilizing the materials which produces less energy and water.
- Minimal use of packaging to get the products ready to distribute.
- Reduction in greenhouse gas emissions.

This approach is systematic integration of environment related aspects into product design. Meanwhile also upholding all operational and safety needs for of consumers. Further, it focuses on significance of early product designing decisions as almost 80% of products' environment related influences can be highlighted at designing stage (Mumtaz et al., 2018). Research scholars put forwards numerous tools for eco-design to make the product more environment oriented (Bovea & Pérez-Belis, 2018). Life cycle (LCA) is among the famous tools which assess the concerned resources and consumption of emissions at each stage of product life cycle (Le, 2020). Notably, eco-design is extensively regarded as a beneficial tool for the improvement of the performance with regard to environment and previously number of studies have also presented evidence in this regard such as electronics (Gill et al., 2020) and disposable diapers (Çankaya & Sezen, 2019). Despite the fact that it is beneficial, often it is reported to be associated with poor performance financially (Pagell & Wu, 2009).

Consumer awareness is growing regarding the environment and traditional operational views are challenged now (Masudin et al., 2018) and notably, the consumers in number are increasing who are expected to pay for the products with superior environment related performance (Akehurst et al., 2012). Persistent innovations in eco-design have improved the image of an organization as a green champion along with it also served as a competitiveness point for them ultimately leading towards high sales volume (Chen & Silverthorne, 2008). Toyota Motor Corporation (TMC) has presented Eco-VAS for the improvement of environment related performance of its cars (Nakao et al., 2007). In this regard, Toyota Prius is regarded as 1st hybrid car and resulted in admissible growth since it is introduced in 1997. Thus, it is justifiable to anticipate that the eco-design lead towards higher financial and environmental performance.

H1: Environmental performance is significantly influenced by Eco-design.

H2: Financial performance is significantly influenced by Eco-design.

Eco-design emphasizes on the sustained development of products or processes, and recovery of investment emphasizes on outdated, EOL, and left-over asset recovery (Alloway & Ayres, 1997). Additionally, recovering invested amount is different from eco-design because the later one focuses on to accomplish a higher from of recycling or reutilization of products by value addition (Guide Jr, 2000). It is worthy to note that the investment recovery is focused on the integration of old-fashioned, EOL and left-over assets back into reverse logistics processes for their appropriate disposal (Wang et al., 2015). Hence, it facilitates the organizations to save their maximum costs and recover the value. It is extensively used across the industries i.e. computers (Heiskanen & Jalas, 2003) and automobiles (Gerrard & Kandlikar, 2007). Following are the few strategies:

- Combining returns of the products from various locations at collection stage
- Ensuring the recovery of the parts from utilized material while recycling
- Production of renovated products to be offered for sales.

It has gained much attention over the years particularly in the recent ones and emerged as a necessary aspect of organizations in presence of ever increasing environmental regulations which put greater obligations on OEMs (Brantingham et al., 2020; Spicer & Johnson, 2004). Despite of simply banning EOL products from landfills, these products take back regulations provide the manufacturers with certain financial benefits which motivates them for the development of effective asset recovery strategies (Dwivedi & Madaan, 2020). Additionally, number of drives are boosting which lead towards the product returns (Minnema et al., 2018). Recently, a survey has revealed that 150 to 200 billion USD worth products are returned by the consumers in United States. Moreover, it is anticipated that such trend will grow with more liberal return procedures (Liu & Jayaraman, 2019). Traditionally, returning the products was regarded as difficult and they were shipped in huge quantity aimed at to reduce the cost which resulted in delayed process to recover (Organization, 2018). But now trend has changed and organizations are now acknowledging the value of

retuned products since they offer them some financial benefits (Ilgin et al., 2017). For example, Xerox has a well-recognized program for recovering the assets known as Xerox Green World Alliance which is aimed at to enhance the environment related performance of EOL products (Pollock et al., 2009). Because of this program Xerox has saved millions of raw material costs over two decades. Hence, it is justifiable to assume that investment recovery significantly contributes towards the financial and environmental performance.

H3: Environmental performance is significantly influenced by investment recovery.

H4: Financial performance is significantly influenced by investment recovery.

Collaborative capability, GSCM practices and firm performance

Previously, it is stated that eco-design practices do not consider the external environment. These are inclusive of wide range of environment related activities within SC participants. It also emerged as a challenge for a single organization to possess all the information related to a product and processes for its production (Nakano & Hirao, 2011). In order to have maximum value from these activities, an organization is asked to consider SC synergistic effects (Thabrew et al., 2009). This construct is backed by Electro technical commission (IEC), which also recommends that eco-design ask for the integration and incorporation of SC members (IEC 2010). Various studies have also indicated that the organizations may anticipate more considerable environment related and finance related improvements when they also consider the designing factors which are not controlled by them (González-Benito & González-Benito, 2005). Traditionally, it was not an easy task to collect data for assessment of these activities particularly in case of globally spread business (Nakano & Hirao, 2011).

Recently happening advancements in ICTs (Information communication technologies) has forced the organizations to adopt them also made easy the adoption of eco-design. Different software packages are available in this regard i.e. SimaPro. This software can facilitate the organizations to quantitatively measure their designing activities and objectives which enables them to precisely assess the anticipated environment and finance related outcomes of the products (Henton &

Held, 2013). Undeniably, collaboration has become a need and compulsory for everyone, and it has also become a fundamental prerequisite for eco-design. For instance, L'Oreal's eco design initiative is primarily based on the collaborative assessment of the environment (Fayolle et al., 2008). Particularly, it enables the close working with the suppliers to assess the environment related influence of raw materials via using the life cycle. It is inclusive of long-run environment related plan which is aimed at sourcing of completely renewable raw materials from sources which are sustainable by 2020. According to Choi and Hwang (2015) integrations and incorporations are also required for Levi Strauss & Co. initiatives for less water consumption in life cycle of its new BWater as it is known that the water is utilized process to produce. Notably, since the introduction of collection in 2011 it resulted in saving 770 million liters of water and sold 13 million BWater jeans. Such initiatives taken by organizations reveal that having the collaborative activities aimed at improvement are important to grasp the benefits of eco-design.

Recovery of investment is focused on the handling of the excessive items within the organizational boundaries (Sinding, 2000). Moreover, Guide Jr et al. (2005) the managers considered the reverse logistics activities as activities which do not create any value for the organization which later on forced them to entertain every aspect of reverse logistics. Resultantly, majority of strategies to recover investment was focused on to accomplish a maximum level of local productivity and long run profits.

Earlier it is mentioned that the EOL handling is become a responsibility for management of manufacturers. Because of increasing importance, now supply chain is inclusive of forward and reverse logistics (Olorunniwo & Li, 2010). Closed-loop supply chain consists of both the forward and backward SC activities (Savaskan et al., 2004). Resultantly, organizations can get benefits from having collaborative investment recovery strategies; for instance, manufacturing organizations may confront the time issues who deal in time-sensitive products. Organizations dealing in laptops can enter partnership with the retailers aimed at to reduce the loss in product value resulting because of bottle necks. According to Blackburn et al. (2004) retailers of such companies assess the condition of the product at early stage. Additionally, number of organizations have made an attempt to increase the

investment recovery value by integrating the forward and backward supply chain (Toffel, 2004). In recent years, Nissan Motor Corporation in Japan has partnered with number of SC members to fasten the recovery of EOL vehicles (McKeown et al., 2014). It is dependent on its dealers responsible for the collection of bumpers. It crushes the damaged or wasted bumpers so the same material can be used to make a new one. Additionally, it also went into partnering with Sumitomo Corporation for the assessment of reprocessing of Nissan LEAF battery to be used for commercial activities. By doing this, it has successfully recovered more than 100 thousand tons of auto shredder remains gathered from vehicle in Japan resulting in 8 million USD plus profit. The above discussion and examples are perfectly explaining that collaborative improvement efforts are required for the investment recovery. Hence, it is hypothesized that:

H5: Collaborative capability significantly associated with the environmental performance.

H6: Collaborative capability significantly associated with the financial performance.

H7: Collaborative capability is a significant mediator between the association of eco-design and environmental performance.

H8: Collaborative capability is a significant mediator between the association of eco-design and financial performance.

H9: Collaborative capability mediates the relationship between investment recovery and environmental performance.

H10: Collaborative capability mediates the relationship between investment recovery and financial performance.

Research Methodology

The quantitative research approach had been applied in the current study. Moreover, the study had been adopted cross sectional research design. As, the variables correlational is seeking in this study, therefore the study is correlational. The researcher asked the questions from the respondents by using self-administered questionnaire. The respondents of the study were supply chain

managers of chemical industry. The supply chain mangers were selected as a respondent because they know better about the SCM activities. The 609 questionnaires were distributed among the supply chain mangers through using a simple random sampling technique. The researcher had received a 251 responses from the respondents that is consist of 41.2 percent total response. During the survey, 29 employees were eliminated as they accomplished only a few questions (Jharkharia & Shankar, 2006) and also failed to provide the demographic data. The questionnaire was adopted from the previous studies and the questionnaire was rated on five point Likert scale that was ranged from 1 which shows strongly disagree and 5 for strongly agree.

Data Analysis and Interpretation

The data was analyzed by using a Smart PLS 3 and applied Partial Least Square (PLS)-Structural Equation Modeling (SEM) technique. This software has unique function as compare to other software for running the moderation and mediation in the model (J. F. Hair et al., 2016, 2017). Moreover, this is also a suitable software for the small sample size and for non-normal data (Hair et al., 2014; J. F. Hair et al., 2016, 2017). There are various studies that had also used this software (Ahmad et al., 2019). The analysis had done by using measurement and structural model.

Measurement Model

For testing the hypothesis, the reliability and validity of the construct is important which shows that construct is valid for further analysis. For this purpose, the convergent and discriminant validity has used in the present study by using a Smart PLS 3. The convergent validity was tested by using a factor loading, composite reliability and average variance extracted (AVE). In the convergent validity, the factor loading value always should be a greater than 0.5, composite reliability value should be a greater than 0.7 and AVE value should be a greater than 0.5 (Hair et al., 2014; J. F. Hair et al., 2016, 2017). The Table 1 predicted values had shown that construct had fulfilled all the convergent validity requirements.

Table 1: Reliability and validity results

Construct	Item	Loadings	Cronbach's Alpha	AVE	CR
Eco design	ECD1	0.877	**0.745**	**0.66**	**0.854**
	ECD2	0.823			
	ECD3	0.735			
Collaborative capability	COC1	0.629	**0.796**	**0.54**	**0.851**
	COC2	0.611			
	COC3	0.696			
	COC4	0.656			
	COC5	0.726			
	COC6	0.725			
	COC8	0.645			
Environmental performance	ENP1	0.764	**0.749**	**0.50**	**0.833**
	ENP2	0.754			
	ENP3	0.685			
	ENP4	0.748			
Financial performance	FP1	0.617	**0.706**	**0.53**	**0.821**
	FP2	0.784			
	FP3	0.757			
	FP4	0.758			
Investment recovery	IR1	0.67	**0.717**	**0.54**	**0.823**
	IR2	0.771			
	IR3	0.713			

Note: ECD-eco-design, COC-collaborative capability, ENP-environmental performance, FP-financial performance, IR-investment recovery.

On the other hand, the discriminant validity could be assessed by using a Fornell and Lacker and Heterotrait-Monotrait ratio (HTMT) (Henseler et al., 2015). In the Fornell and Lacker, all the diagonal values square root of AVE should be greater than from other below values that shows construct had the discriminant validity (Henseler

et al., 2015). On the other hand, in the HTMT the constructs correlation should be a less than 0.85 that shows construct had a discriminant validity (Henseler et al., 2015). The Table 2 and Table 3 had shown that construct had a discriminant validity.

Table 2: Fornell and Larcker Criterion for Discriminant Validity

	ECD	COC	ENP	FP	IR
ECD	0.717				
COC	0.336	0.671			
ENP	0.280	0.611	0.709		
FP	0.405	0.579	0.445	0.732	
IR	0.238	0.447	0.446	0.384	0.733

Note: ECD-eco-design, COC-collaborative capability, ENP-environmental performance, FP-financial performance, IR-investment recovery.

Table 3: HTMT Analysis for Discriminant Validity

	ECD	COC	ENP	FP	IR
ECD					
COC	0.472				
ENP	0.375	0.78			
FP	0.577	0.76	0.608		
IR	0.379	0.569	0.593	0.541	

Note: ECD-eco-design, COC-collaborative capability, ENP-environmental performance, FP-financial performance, IR-investment recovery.

Structural Model

When the being assessed that construct fulfilled the requirements of the measurement model, then the structural model assessment had done by using a 500-resampling bootstrap through using a Smart PLS 3.0 for the hypothesis testing. The SEM analysis had shown that eco-design (ECD) had a positive and significant relationship with the environmental performance (ENP). Therefore, hypothesis 1 is accepted. In the same vein, ECD had a significant relationship with the financial

performance (FP). In this regard, the hypothesis 2 is accepted. The SEM analysis further shown that investment recovery (IR) had also a positive and significant relationship with the environmental performance (ENP). Therefore, hypothesis 3 is accepted. In the same vein, IR had also a significant relationship with the financial performance (FP). In this regard, the hypothesis 4 is accepted. The direct effect further shown that collaborative capability (COC) had a significant relationship with the environmental performance (ENP). Consequently, hypothesis 5 is accepted. In the same vein, COC had a significant relationship with the financial performance (FP). In these respects, the hypothesis 6 is accepted. These findings had shown that all of the above following indicators are considered to be an important indicator for increasing the performance of food and beverages industry. The direct effect all results are predicted in the following Table 4 below.

Table 4: Direct Hypothesis results

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Results
ECD -> ENP	0.175	0.175	0.059	2.956	0.003	Accepted
ECD -> FP	0.157	0.155	0.059	2.654	0.008	Accepted
IR -> ENP	0.502	0.501	0.044	11.318	0.000	Accepted
IR -> ENP	0.497	0.494	0.041	12.023	0.000	Accepted
COC -> ENP	0.701	0.699	0.047	15.061	0.000	Accepted
COC-> FP	0.201	0.208	0.061	3.2940	0.001	Accepted

Note: ECD-eco-design, COC-collaborative capability, ENP-environmental performance, FP-financial performance, IR-investment recovery.

While indirect SEM analysis had shown that COC had a mediating effect in the relationship of ECD and ENP which is supporting to hypothesis 7. In addition, indirect SEM analysis further shown that COC had a mediating effect in the relationship of ECD and FP which is supporting to hypothesis 8. Therefore, these results had shown that ECD did not only effect directly to the Performance but also effect indirectly to performance. On the other hand, indirect SEM analysis further shown that COC had

not a mediating effect in the relationship of IR and ENP which is not supporting to hypothesis 9. In the same vein, indirect SEM analysis further shown that COC had not a mediating effect in the relationship of IR and FP which is not supporting to hypothesis 10. This shows that COC is not an important mediating variable among the IR and Performance indictors relationship. A possible reason for this relationship is that there could be an overlapping of various other variables in model. Therefore, there is a need of time to restructure this model in future. The indirect effect all results are predicted in the following Table 5 below.

Table 5: Indirect Hypothesis results

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Results
ECD -> COC ->ENP	0.232	0.236	0.085	2.734	0.006	Accepted
ECD -> COC ->FP	0.146	0.152	0.047	3.109	0.002	Accepted
IR -> COC ->ENP	0.159	0.152	0.088	1.806	0.072	Rejected
IR ->COC ->FP	0.060	0.065	0.059	1.024	0.306	Rejected

Note: ECD-eco-design, COC-collaborative capability, ENP-environmental performance, FP-financial performance, IR-investment recovery.
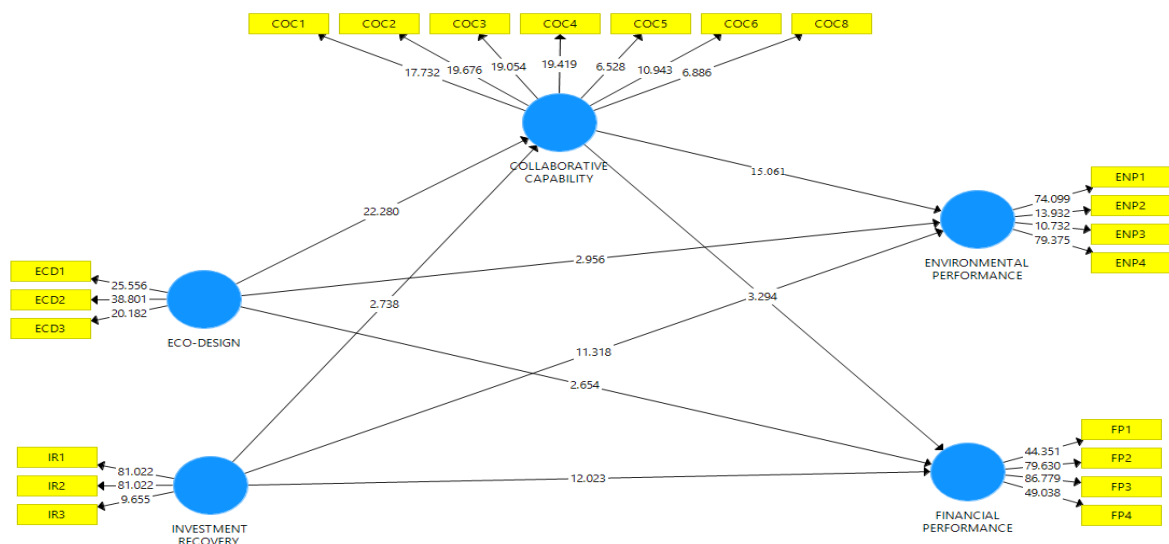

Figure 2: Structural model

Conclusion

The study purpose is to investigate the mediating effect of collaborative capability (COC) in the relationship of supply chain management practices (SCMP) and organizational performance (OP) of food and beverages industry in Thailand. The data had collected from the senior managers of food and beverages. The Structural Equation Modeling (SEM) had shown that all the following proposed direct hypothesis was accepted that is a major contribution of the study. The indirect effect relationship had shown that COC is significantly and positive mediating in the association of the ECD and both organizational performance indicators. While COC had not significant mediating variable within the relationship of IR and both of OP indicators. Therefore, this relationship had shown that there is need of time to see this relationship further. The empirical findings had a major contribution. Firstly, the study could provide help to the policy makers and owners to know about the importance of these indicators so that in future they could take help to increase their OP. Secondly, the study findings could also provide help to take a collaboration among the researchers and owners to increase their OP. Along with these contributions, the current study still had some limitations. At first, the study is limited on one sector that had not a more generalizability. Therefore, future comparative study in industries could be an established. At second, the study was limited on Thailand that is a developing country which findings could be generalized on the developed country were organization structure in different. Therefore, future research could be done on developed economy. At third, the investment recovery is not mediating by collaborative capability, in this regard, a future research could be done with the same framework in another country to know about the results variation.

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