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Supply Chain through Contract Farming in Indonesian Poultry Industry

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Abstract: The objective of the present study is to examine the role of contract farming in supply chain business performance among poultry industry of Indonesia. Contract farming is becoming the important element of business, particularly in the poultry industry. It is based on the integration of producers (growers) and integrator (buyers of the products). Five hypotheses were proposed by concerning the relationship between grower, integrator, supply chain business performance and supply chain management capabilities. Population of this study is based on the poultry companies in Indonesia. Employees of poultry companies were selected as the respondents. Structural equation modeling is used to test the hypotheses. Data were collected through simple random sampling and self-visit to the poultry companies. Findings shows that contract farming has significant positive effect on supply chain business performance. Integration between grower and integrator has significant role to enhance supply chain business performance. Moreover, supply chain managerial capabilities enhance the positive effect of integrator involvement on supply chain business performance.

Keywords: Supply chain, grower involvement, integrator involvement, management capabilities, poultry industry.

1. INTRODUCTION

Contract farming is like a future contract between the producers (growers) and integrator (buyers of the products), generally this contract is in line with the business direction and business welfare which specifies the quantity as well as quality of the growers, and also, in few cases, transferring the resources of production (Singh, 2008). It can be defined as, it is the prior agreement between produces and buyers, in which as buyers committed to purchase and producer committed to produce certain products with certain quality at specified time (Minot, 2018). There are many definitions of contract farming and descriptions that how the system works by the type of various responsibilities that are shared by grower and integrator. For instance, in case of poultry industry, the grower must preserve the broiler farm that is on his own land, and to confirm that he harvests and delivers a specific amount, while an integrator or buyer of product is liable for providing the producer with the mandatory equipment as well as inputs(Azam, Haseeb, binti Samsi, & Raji, 2016; Azam, Haseeb, & Samsudin, 2016; Haseeb &

Azam, 2015; Haseeb, Bakar, Azam, Hassan, & Hartani, 2014).

Contract farming is becoming the important element of business. It has significant positive effect on welfare (Bellemare & Bloem, 2018). In this type of agreements, both buyer and produces are secured as it is based on prior agreement to production. This concept is growing in supply chain practices. It has significant influence on the supply chain activities and supply chain performance, particularly in poultry industry. Poultry industry is much important for the economy. This industry has significant contribution in gross-domestic product of each country (Islam, 2014). In Pakistan, this industry is one of the source of poverty alleviation by employing 1.7 million people on jobs and reasonable contribution in GDP of country (Abbas et al., 2018). In case of India, this industry is valued at about 350 billion rupees having a biggest market worldwide with 4% contribution to GDP and 27% contribution to the to agriculture GDP (Sharma et al., 2018). In case of Nigeria, this industry contributing 25% to the agriculture GDP (Fasanmi et al., 2018). Thus, poultry industry has vital importance for each country.

In case of Indonesia, no doubt poultry industry is one of the dominant industry and growing rapidly, however, this industry is facing various issues related to supply Chain. The journey of the expansion
of poultry industry in Indonesia has
experienced ups and downs. In the era of 1997, the monetary crisis in Indonesia had caused the poultry industry particularly broiler chicken farms crashed (Nurtini, Muzayyanah, Haryadi, & Hakim, 2017). Now this industry is growing with a high speed. Figure 1 shows the growth of Indonesian poultry industry. It is evident that this industry growing in each year with constant growth.

This industry can be supported with contract farming which can also resolve the issues in supply chain. Integrator involvement has significant influence on business. According to Ahmad Shabudin (2014), integrator involvement in internal coordination and innovativeness has significant influence on supply chain which has contribution in business performance. Communication with integrator provides helps to generate various ideas which promote supply chain by resolving various supply chain related issues. Integration between grower and integrator has important role for supply chain in poultry industry (Ahmad Shabudin, 2014). Additionally, management involved in supply chain activities has significant effect on business performance. As the management capabilities always have positive contribution in business performance (Purnama, 2014; Castorena, et.al. 2014; Solomon, et.al. 2014; Jaya & Verawaty 2015; Niesten & Jolink, 2015; Cohen & Olsen, 2015; Dim & Ezeabasili, 2015; Wang & Lu, 2016; Ferraris, Santoro, & Dezi, 2017; Nazal, 2017; W.-U. Hameed, Mohammad, Shahar, Aljumah, & Azizan, 2018; Taqi., Ajmal & Ansari, 2018).

Thus, the objective of the present study is to examine the role of contract farming in supply chain business performance among poultry industry of Indonesia. The other objectives are given below;

1. To examine the effect of integrator involvement on supply chain business performance.
2. To examine the effect of grower involvement on supply chain business performance.
3. To examine the moderating effect of supply chain management capabilities.

Figure 2 shows the theoretical framework of the present study. This study is important because it examined the neglected area in supply chain management. As the contract farming is not well acknowledged by researchers in

literature. Moreover, it is important because this is the pioneer study which investigated the role of contract farming in Indonesian poultry industry.

2. LITERATURE REVIEW

2.1 Supply Chain in Poultry Industry

In the poultry industry, the fundamental element inside the supply chain structure is called as an integrator. This integrator has a vertically integrated supply chain, being the proprietor of a large portion of the breeding, slaughtering and handling offices. It makes utilization of the most recent technology and keeps up stringent hygienic guidelines in all its forms. It works together with different appropriation systems, from supermarkets to merchants. Figure 3 shows the broiler production supply chain process.

A vertical production chain is comprised of a solitary organization dealing with each part of production stage. In this manner, feed companies, farms, various processing plants, dispersion channels, and markets would all be able to be integrated into a solitary comparing supply framework. Because of unsteady conditions in neighbourhood markets, numerous makers are exchanging much more into these sorts of vertical frameworks. Besides, the majority of the market is under the control of a couple of extensive organizations, and this can represent a peril to the poultry industry.

Thus, the increasing demand of poultry products can be manage through various supply chain strategies (Mountney, 2017). The current study is one of the attempt to highlight grower and integrator integration to enhance supply chain in poultry industry. It will automatically increase the contribution in nation's GDP.

2.2. Integrator Involvement and Supply Chain Business Performance

Effective product development must be attained if the firm can proficiently join internal units, comprising marketing, assembling, R&D, as well as purchasing (Gerwin & Barrowman, 2002). An arrangement of internal combination systems for instance cross-functional teams, worker inclusion, employee participation, engineering, committed groups, engaged groups have been proposed for various stages of product development (Griffin, 2002; Hargadon & Eisenhardt, 2000). Subsequently, in this investigation, integrator involvement is characterized as the level of communication among deals and marketing, innovative work, and production as well as inventory administration completely through the product development procedure. Therefore, the coordination of integrator is important in supply chain management. It is also important for investment decision making (Duru & Chibo, 2014: Angbre, 2016; Nze, et.al. 2016; Tanoos, 2017; Kimengsi & Gwan, 2017; Wireko-Manu & Amamoo, 2017 ; Chowdhury, et.al. 2018; W.-U. Hameed, Sabir, Razzaq, & Humanyon, 2018) and to tackle the various pollical influences (Maqbool, Hameed, & Habib, 2018) because integrator provides valuable information's from market.

As per Song and Benedetto (2008) recommendations, integrator is seen as a critical course for the achievement of new product. Van Echtelt, Wynstra, Van Weele, and Duysters (2008) described that immediate cooperation of the integrator is required among the product development forms and innovativeness. Fliess and Becker (2006) propose that it includes the joined product configuration, process building and production tasks with real integrators. Integrator like supplier helps in acquiring assets which has impact on product advancement through innovation (Grant, 1996).

Moreover, according to W. Hameed, Basheer, Iqbal, Anwar, and Ahmad (2018), the collaboration between integrators such as customer, supplier and partners is required to innovate something new. It increases the accuracy in supply chain

performance. New ideas from integrators enhances the innovation in supply chain which ultimately increases the business performance. Thus, it is hypothesized that;

H1: Integrators involvement has positive effect on supply chain business performance.

2.3 Grower Involvement and Supply Chain Business Performance

Feng, Sun, and Zhang (2010), defined grower involvement as the direct contribution of the grower in the design as well as growth phases of product or service development in which the grower is participated in problem-solving activities and works with the producers to develop the end product. It includes a joined product configuration, process building, and production tasks with real growers. As indicated by Fujimoto and Clark (1991) the early investment of growers or starting grower input is essential in the creation of latest products and supply chain activities. It helps the venture groups to distinguish thoughts and share new ideas for new development of product or services (Ittner & Larcker, 1997).

External communication with real growers has been stressed just like a key achievement factor for service development ventures (Von Hippel, 2005). As Browne and Allen (1998) propose, the thinking behind external communication builds the decent variety of data, along these lines bringing about an expansion in the nature of the development procedure. The exclusive capacity of informal communication facilitates transfer of complex, ambiguous and novel ideas, and also help to provide the likelihood to capitalize on surprising as well as unexpected answers (Salomo, Steinhoff, & Trommsdorff, 2003). Therefore, from the discussion below hypothesis is proposed;

H2: Grower involvement has positive effect on supply chain business performance.

2.4 Supply Chain Management Capabilities

Economic theory identifies numerous procedures by means of which capabilities contributes to business performance. Despite the significance of capabilities in economic theory (Loasby, 2002), it appears that inadequate preference has been given up to this point to capability creation in the sector of poultry as well as agri-food. It perceives that capability building portrays agri-food frameworks at the level of whole chains and gatherings of agents (Fritz & Schiefer, 2008), and keeps up that ability is a powerful source of competitive advantage (Schroeder, Bates, & Junttila, 2002) which increases the business performance (Abidin, Bakar, & Haseeb, 2015; Abidin, Bakar, & Haseeb, 2014; Haseeb, Hartani, Bakar, Azam, & Hassan, 2014; Haseeb, Hassan, & Azam, 2017). It appears that a particular characteristic for the agri-food segment, which offers vital precedents on how selections positively affect the level of capabilities which is connected to the delivery of the sources of codified knowledge (Nonaka & Takeuchi, 1995).

A number of previous studies are available in literature which demonstrates that management capabilities is key to the business success. With regards to the current study, in poultry industry, management capabilities encourage the integration of integrator and grower which is beneficial for supply chain business performance. Therefore, management capabilities are playing the role of moderator.

H3: Supply chain management capabilities has significant positive effect on supply chain business performance.

H4: Supply chain management capabilities moderates the relationship between integrator involvement and supply chain business performance.

H5: Supply chain management capabilities moderates the relationship between grower

involvement and supply chain business performance.

3. RESEARCH METHOD

Primary data were collected in order to find the role of contract farming in supply chain business performance. According to Polit Denise and Hungler Bernadette (1999), information obtained during the investigation or study is called data. In the present study, the information was gathered by suing survey questionnaires. The respondents of the study were the employees of poultry companies from Indonesia. All the questionnaires were distributed through self-visit to the poultry companies. Therefore, by examine the nature, objective and problem of the study (Ul-Hameed, Mohammad, & Shahar, 2018), quantitative approach was adopted.

According to Comrey and Lee (1992), sample which is less than 50 members will be a weaker sample; sample size of 100 participants will be weak; 200 will be adequate; 300 will be considered as good; 500 very good and 1000 will be outstanding. Therefore, keeping in view the above Comrey and Lee (1992) findings the 300 sample size has selected which is good.

Hence, 300 survey questionnaires were distributed among the employees of poultry related companies. Total 180 valid responses were collected and analysed through PLS structural equational modeling techniques. Version 3 of PLS was used to analyse the data. PLS-SEM is one of the prominent techniques to test the hypothesis (Henseler, Ringle, & Sinkovics, 2009; Reinartz, Haenlein, & Henseler, 2009).

Moreover, a 5-point Likert scale was utilized to get the data. All the questionnaires were distributed through simple random sampling techniques. Survey instrument was divided into two major sections. First section was covering the profile of respondents and second was covering the items related to the major variables.

4. FINDINGS

The analysis of the present study is based on structural equation modeling. It is one of the suitable techniques to handle the complex model. It is also suitable while handing the data with small sample size. According to Reinartz et al. (2009), PLS-SEM requires to fulfil the criteria of factor loadings, composite reliability and AVE. According to the prior studies F. Hair Jr, Sarstedt, Hopkins, and G. Kuppelwieser (2014) and Henseler et al. (2009), value of factor loadings, composite reliability and AVE should be above 0.7, 0.7 and 0.5, respectively. Figure 4, Table 1 and Table 2 shows that all the value attain the satisfactory level.

Discriminant validity was studied with the help of square root of AVE. Table 3 shows that the square root of average variance extracted(AVE) in bold format is higher than the other values. Moreover, convergent validity was examined by investigating the AVE value. AVE value more than 0.5 is the clear indication of convergent validity achievement.

Furthermore, hypotheses testing is shown in Table 4. It is carried out with the help of PLS bootstrapping technique. Figure 5 shows the PLS bootstrapping. According to the literature, for acceptance of relationship, t-value should be above 1.96 and p value should be less than 0.05. From the current study, it is clear that H1, H2 and H3 has have t-value above 1.96. Thus, all these hypotheses are accepted.

Furthermore, Table 5 shows the moderation effect. According to the results, the moderation effect is significant in one case. In case of integrator involvement, the moderation effect is significant as the t-value is above 1.96. However, in case of grower involvement, the moderation effect is insignificant. Hence, H4 is accepted and H5 is rejected.

Nevertheless, Figure 4 shows the R^2 value which is 0.864. According to Chin (1998), this is substantial value. It means that all the independent variables are expected to bring 86.4% change in dependent variable, namely; supply chain business performance. Additionally, predictive relevance (Q^2) is shown in Table 6 which shows the quality of model. It should be higher than zero (Henseler et al., 2009).

5. DISCUSSION AND CONCLUSION

This study was carried out to examine the role of contract farming in supply chain business performance among poultry industry of Indonesia. Contract farming includes the integrator involvement and grower involvement. Moreover, the moderating role of supply chain management capabilities was also examined. The respondents of the study were the employees of poultry companies from Indonesia.

Findings of the study shows that integrator involvement has significant positive effect on supply chain business performance with t-value 2.547 and p-value 0.007. It shows that the increases in integrator involvement increases the supply chain business performance. Moreover, it is found that grower involvement also has positive effect on supply chain business performance with t-value 3.323 and p-value 0.001. Better involvement of grower has positive contribution in supply chain business performance.

Thus, a well-organized involvement of integrator and grower always shows vital contribution in supply chain business performance among Indonesian poultry companies. According to Chesbrough (2006), supplier provides valuable ideas as well as external knowledge which promotes innovation and business performance. Consistent with current findings, Navasiri, Kumar, Garza-Reyes, Lim, and Kumari (2016) found a significant effect between supplier selection and business performance.

Furthermore, supply chain management capabilities also have significant contribution in supply chain business performance. As the relationship of supply chain business performance and supply chain management capabilities found t-value 17.125 and beta value 0.980. It demonstrates that supply chain management capabilities increase the supply chain business performance. The results of the current study is consistent with Tracey, Lim, and Vonderembse (2005); Wu, Yeniyurt, Kim, and Cavusgil (2006) and Bowen, Cousins, Lamming, and Farukt (2001). Moreover, the moderation effect is shown in Figure 6.

Moderation effect of supply chain management capabilities between integrator involvement and supply chain business performance is significant with t-value 6.399 and p-value 0.000. Figure 6 shows that supply chain management capabilities enhance the positive effect of integrator involvement on supply chain business performance. Thus, improvement in supply chain management capabilities increases the supply chain business performance.

Finally, it is concluded that contract farming has positive contribution in supply chain business performance and supply chain management capabilities enhance the positive effect of contract farming among poultry companies in Indonesia. Thus, it is recommended to the Indonesian poultry

companies to encourage contract farming. Future research is required to introduce various open-innovation strategies in contract farming.

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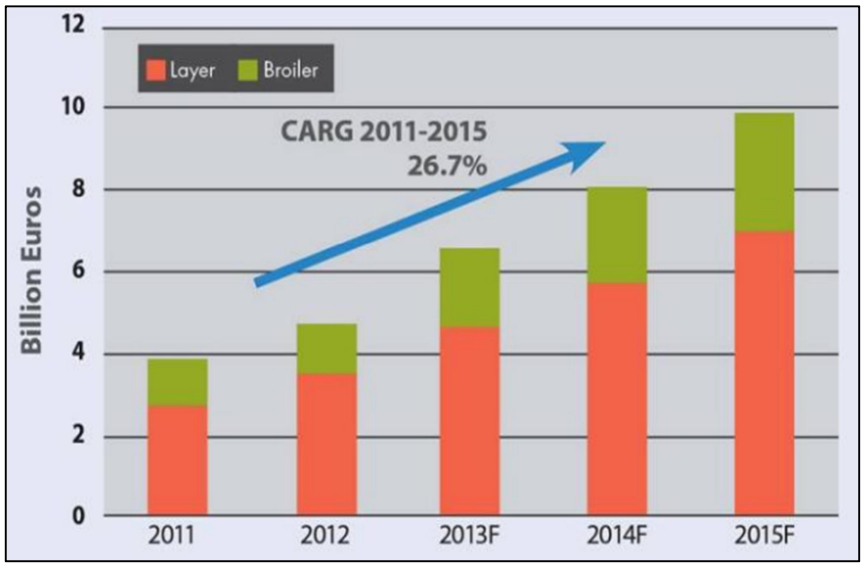

Figure 1. Growth of Indonesian Poultry Market (2011-2015).

Source: PT clarity Research Indonesia (2014)

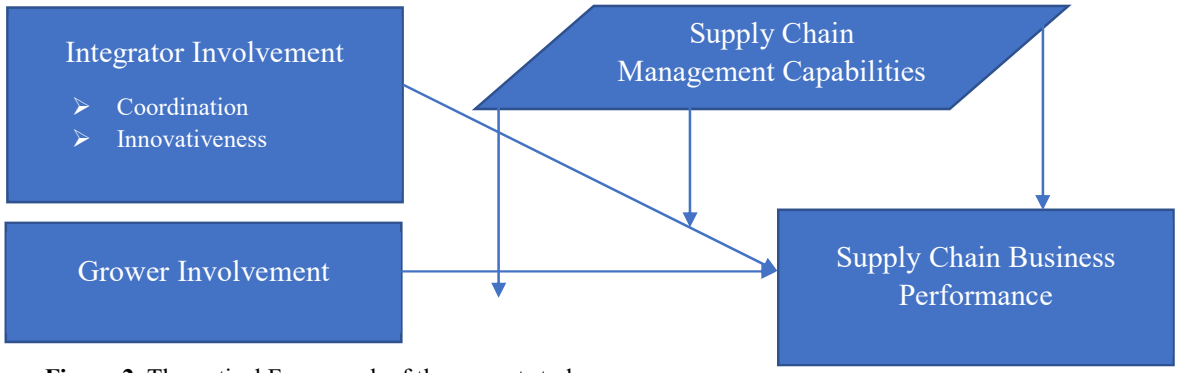

Figure 2. Theoretical Framework of the current study

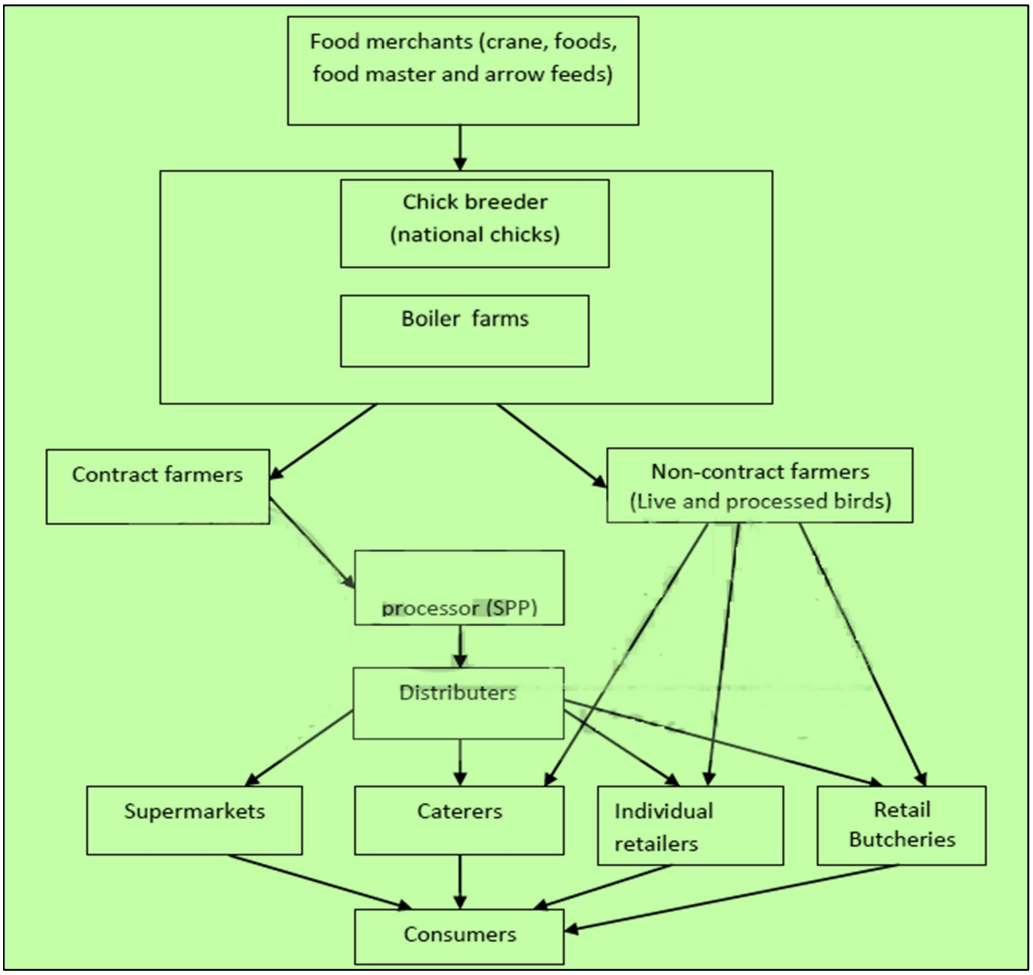

Figure 3. The Broiler Production Supply Chain

Source: Ahmad Shabudin (2014)

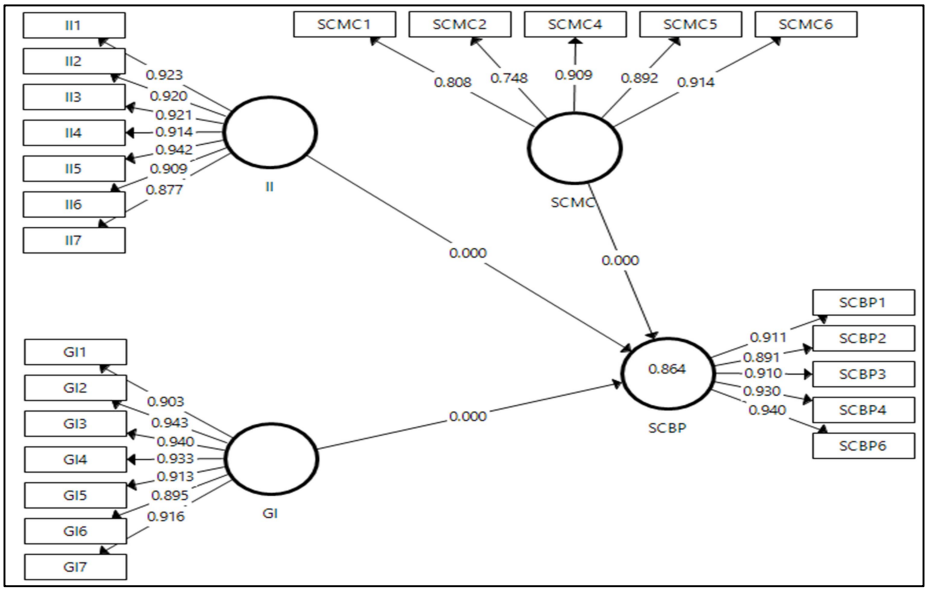

Figure 4. Factor Analysis

Table 1. Loadings

	GI	**II**	**SCBP**	**SCMC**
GI1	0.903			
GI2	0.943			
GI3	0.940			
GI4	0.933			
GI5	0.913			
GI6	0.895			
GI7	0.916			
II1		0.923		
II2		0.920		
II3		0.921		
II4		0.914		
II5		0.942		
II6		0.909		
II7		0.877		
SCBP1			0.911	
SCBP2			0.891	
SCBP3			0.910	
SCBP4			0.930	
SCBP6			0.940	
SCMC1				0.808
SCMC2				0.748
SCMC4				0.909
SCMC5				0.892
SCMC6				0.914

Table 2. Cronbach's Alpha, Composite Reliability and Average Variance Extracted (AVE)

	α	**rho_A**	**CR**	**(AVE)**
GI	0.970	0.971	0.975	0.847
II	0.968	0.969	0.973	0.838
SCBP	0.952	0.953	0.963	0.840
SCMC	0.909	0.926	0.932	0.734

Table 3. Discriminant Validity

	GI	II	SCBP	SCMC
GI	0.921			
II	0.908	0.915		
SCBP	0.682	0.676	0.917	
SCMC	0.808	0.809	0.902	0.857

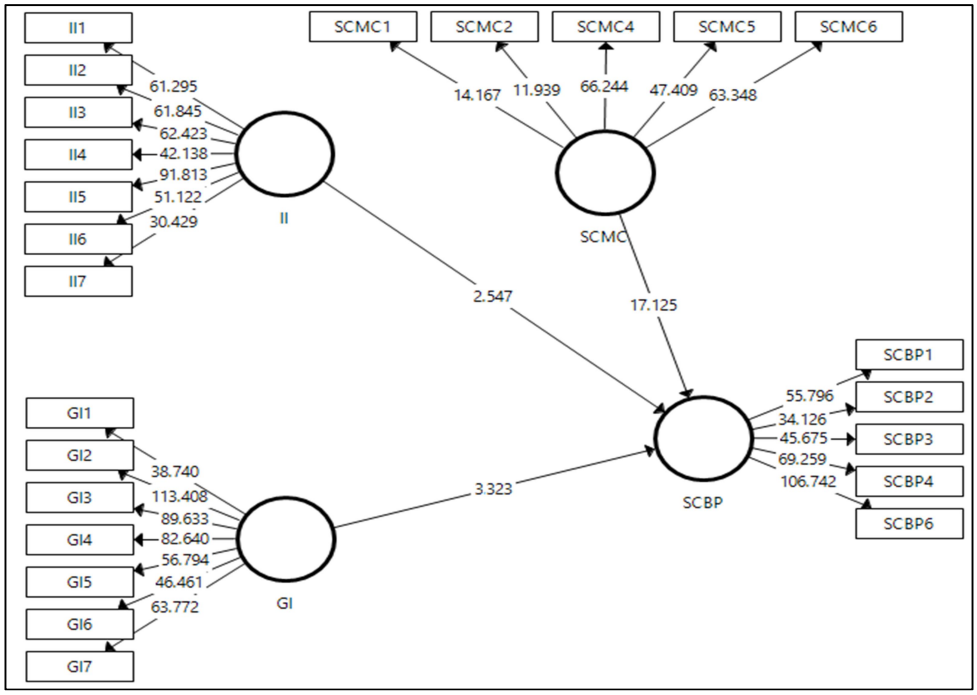

Figure 5. PLS Bootstrapping

Table 4. Hypotheses Results (excluding moderation)

		(O)	(STDEV)	T Statistics	P Values	Decision
H2	GI -> SCBP	0.332	0.099	3.323	0.001	Accepted
H1	II -> SCBP	0.116	0.046	2.547	0.007	Accepted
H3	SCMC -> SCBP	0.980	0.057	17.125	0.000	Accepted

Table 5. Hypotheses Results (moderation results)

		(O)	(STDEV)	T Statistics	P Values	
H5	GI* SCMC					No
	-> SCBP	0.121	0.086	1.4031	0.101	Moderation
H4	II* SCMC					
	-> SCBP	0.263	0.041	6.399	0.000	Moderation

Table 6. Predictive Relevance (Q^2)

	SSO	SSE	Q^2 (=1-SSE/SSO)
SCBP	900.000	292.792	0.675

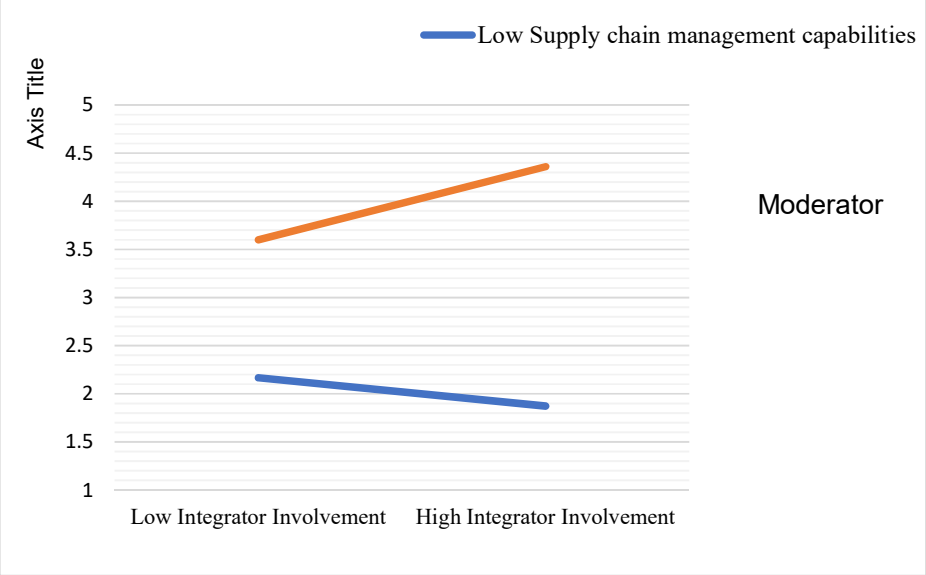

Figure 6. Moderation effect of supply chain business performance