

# Uncertain Supply Chain Management

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## The corporate governance, supplier network and firm supply performance

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### ABSTRACT

Corporate governance has emerged as a sine-qua of corporate success. The stakeholder theory of corporate governance consists of various factors, other than the economy and finance and considers corporate governance as an important determinant of the supply chain performance and the supplier relationship. Following the stakeholder theory, the current study studies the impact of the corporate governance, and supplier diversification network on the firm supply performance. In addition, the current study investigates the moderating role of supplier diversification in the relationship between three corporate governance characteristics; namely board size, board independence, and board competency and firm supply performance. The study is carried out on a sample of the industrial firm in Indonesia. To achieve the research objectives PLS-SEM technique is employed. The findings of the study provide a great deal of agreement with the proposed hypotheses. The findings of the current study are helpful for the policymakers, researchers and practitioner in examining and understanding the link between corporate governance, supplier network and firm supply performance.

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## 1. Introduction

The code of corporate governance is the set of regulations, usually formulated by capital market regulatory authorities such as security and exchange commission to control and govern the organizations (Jiang & Zhang, 2018). The recent episode of the subprime crisis has made it realized to the world that, transparency in corporate management is one of the most important factors of the smoothly functioning capital market (Allen, 2017; Mudambi & Pedersen, 2007). Corporate governance comprises of two sub governance mechanisms known as external and internal control mechanisms. The external governance mechanism of the corporate governance is the external control offered on the firm through the board of directors. Whereas the internal control mechanism consists of functions such as internal audit committee, risk market committee and HR committee. Here a question arises: what is basic purpose of corporate governance? Is it only meant to solve and economic and financial problems or its scope is beyond them? The answer is yes as the organization has a deliberate structure (Allen, 2017) which means it consists of many departments and the performance of each department is heavily dependent on the others. Meanwhile, the stakeholders and their aligned interest may vary from

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department to department, and the opportunity to expropriate the shareholder's wealth may be different in every department. Therefore, in the current study, following the stakeholder theory of corporate governance we try to highlight the role of effective corporate governance, on supplier diversification and firm supply performance.

In recent decades, the supply chain manager has gained increasing attention from both academicians and researchers (Stevens & Johnson, 2016). The supply chain is a chain type structure which connects all the first-tier suppliers (Johnson et al., 1996; Crainic & Laporte, 2016). The supply chain management (SCM) is a vast area, which covers almost everything related to the product, production delivery and the value addition at every step of the product development. The effective supply chain management ensures the minimum exploitation of the resources by getting the optimum output. The SCM follows a system perspective by considering the organizational functions in a systemic pattern. Meanwhile, the structural collaboration may include vendor-controlled inventory, outsourcing, collocating factories and just-in-time (Co & Barro, 2009).

The strategic choices made by the organization executives have a significant impact on the organizational performance (Stevens & Johnson, 2016). According to agency theory, the executive strategic choices are largely shaped by the control and check mechanism by the board of directors (Jiang & Zhang, 2018). Agency theory views the manager as an agent hired to maximize the shareholders or owners wealth (Jiang & Zhang, 2018). However, agency theory argues that there is cost, which arises from the conflict of the interest between owners and managers which are known as agency cost has a significant impact on firm performance. Agency theory view that the risk-taking segment (management) is subject to the self-interest and expropriate the wealth of the risk-bearing segment (owners). This view considers the i) technical competency of directors and management ii) the alignment of interest of management and ownership iii) the effectiveness of internal corporate governance mechanism iv) The effective supplier management.

The majority of the studies on the issue of corporate governance effectiveness is in the field of accounting, finance and economics. However, little has been accomplished to explore the impact of the effective corporate governance mechanism on them. Therefore, following the stakeholder theory and the agency theory the current study is being carried out to fill this gap, by studying the relationship between corporate governance, supplier diversification and firms supply performance of Indonesian manufacturing firms.

## **2. Literature review**

### *2.1. Corporate governance supply chain performance*

In emerging economies, the sound corporate governance in the form of an effective code of corporate governance is the pre-condition of increasing investment from the institutional investors (Basheer, 2014). The level of compliance a firm shows with the code of corporate governance shows its governance quality (Munisi et al., 2014; Reddy et al., 2015). According to Jensen and Meckling (1976), there is a separation of the risk-bearing and risk-taking function, because of this separation there exists a conflict of interest between owners and managers. According to Basheer (2014), this conflict of interest is known as the agency conflict. The dispersed ownership of corporation offers the managers more incentive in the expropriation of the wealth of the minority shareholders. This dispersed ownership also made the management more autonomous and powerful. The corporate governance literature has provided the solution of the above problem by installing an external control mechanism in the form of a board of directors. The board of director competencies, independence and the board size have been discussed as key determinants of agency conflict (Javed & Basheer, 2017). Thus, it is evident from the literature that there exists a conflict of interest between owners and managers and board of directors offers effective control mechanism to bridge the gap (Munisi et al., 2014; Reddy et al., 2015; Basheer, 2014).

Apart from agency theory, there exists a stakeholder theory, which considers the organization as a set of interconnected systems known as its stakeholders (Jensen, 2017). According to the stakeholder theory, every stakeholder contributes to the success of the organization (Jensen, 2017). This theory considers the organization as a set of multiple relationships and is not limited to the principal-agent relationship of the agency theory (Stout & Blair, 2017). The stakeholders are suppliers, buyers, community, government, employees and creditors are the stakeholders of the organizations (Muller, 2017). The stakeholder theory views that the contribution of all these stakeholders is critical for the success or failure of the organization and unlike the agency theory is not the subject of managers and owners (Stout & Blair, 2017). The two-tier board system which is prevalent in Germany and Japan, the board composition is based on the stakeholder theory (Stout & Blair, 2017). The stakeholder view of the corporate governance was broached by Senbet (1998). He claimed that the owners are not alone to bear the cost, nor are they only to enjoy the profit rather the stakeholders who are either attached with the company or product financially or emotionally also influence the managerial decision and influenced by the managerial decision.

Hillman and Dalziel (2003) argue that both monitoring and advisory roles of the board are functions of the board capital (experience, reputation, expertise, and network ties) since outside directors are heterogeneous. In integrating the agency and resource dependence perspectives as suggested by Hillman and Dalziel (2003), Dalziel et al. (2011) examined different effects of inside and outside directors. They conclude that director independence affects the extent that directors use their human capital to influence R&D spending. Directors that must be admitted to the board must have the above-required qualifications that will make them add value to the company. Such value adding services include attracting resources to the firm from outside through their network ties, building political linkages for the firm, introducing new customers and suppliers, and through their wealth of experience and knowledge providing sound advisory services to the executives for the enhancement of firm value (Haniffa & Cooke, 2002; Hillman et al., 2000; Basheer, 2014).

## *2.2. Supplier diversification and supply chain performance*

Supply chain performance is defined as the result of systematic, strategic, and efficient coordination of the conventional business functions within and across the organization which include actions as well as procedures related with transforming material into complete goods (Bharati & Chaudhury, 2006; Romli & Ismail, 2014; Ekpung, 2014; Sarwar & Mubarik, 2014; Okon & Monday, 2017; Kimengsi & Gwan, 2017; Bollazzi & Risalvato, 2018; Basheer et al., 2019). Asset management is excluded in the measurement list of supply chain operational performance variable. This is because operational performance does not emphasize financial performance since asset management in the definitions of the SCOR model is more to return on investment. In this study, supply chain reliability is defined as the quality of the supply chain in performing and maintaining perfect order fulfilment, which delivers needs as per stated requirements. Besides, supply chain responsiveness is defined as the speed of a supply chain provides products, services, or information to members of the supply chain.

Furthermore, supply chain agility is defined as the ability to quickly adjust the tactics and operations of the supply chain in responses to market changes. Moreover, supply chain costs are defined as the costs associated with operating the supply chain. Inventory holding period (inventory turnover period or stock holding period or days of inventory or inventory conversion period) is one of the major items of working capital. It is the number of days on average that a business takes to turn inventories or stock into cash or debtors in a year (inventory turnover per annum). The goal of inventory management is to maintain an optimal level of inventory that ensures continuous and uninterrupted business operations at minimum cost (Koumanakos, 2008; Yusuf & Idowu, 2012; Ali et al., 2016; Omodero & Ogbonnaya, 2018). The supply chain is an organization network, which associates corporate activities and coordination within and between organizations to create value for the customer. An effective SCM enables firms to make informed decisions in supply chain function, which start from procurement of materials for manufacture to become products and then distribute the products to the final customer

(Boubekri, 2001). SCM grows within and across organizations by the information flow to truly support the real-time communication (Boubekri, 2001). IT applications such as the internet, intranet, and extranet-based tools are becoming essential for firms to optimize the materials flow and information flow in the entire supply chain (Boubekri, 2001). The extended supply chain network moves beyond the individual firm to inter-organization functions, including suppliers, customers, trading partners, service providers, retailers, manufacturers, and transporters.

SCM is a critically significant strategy for today's highly competitive, turbulent, unpredictability, and dynamic business environments (Rabelo et al., 2004; Chidoko & Mashavira, 2014; Salvioni & Gennari, 2014; Razek, 2014; Eshiet, 2017; Mejdoub & Arab, 2017; Oitsile et al., 2018; Chang'ach, 2018; Şener et al., 2011). Organizations are now extremely exploring the potential of SCM concept to get their products to market in minimum time and to lower the total cost and enhance the total quality, increase customer service, and reach greater profitability (Boubekri, 2001). It enables coordinating and controlling of material flow and information flows throughout the business process from sources to customers wherein gets the correct product to the right place at the minimum cost with minimum inventory while offering greater customer service and shortens lead times (Boubekri, 2001). Thus, in the twenty-first century, SCM is a crucial and significant strategy for success in the global markets (Zahra & Pearce, 1989).

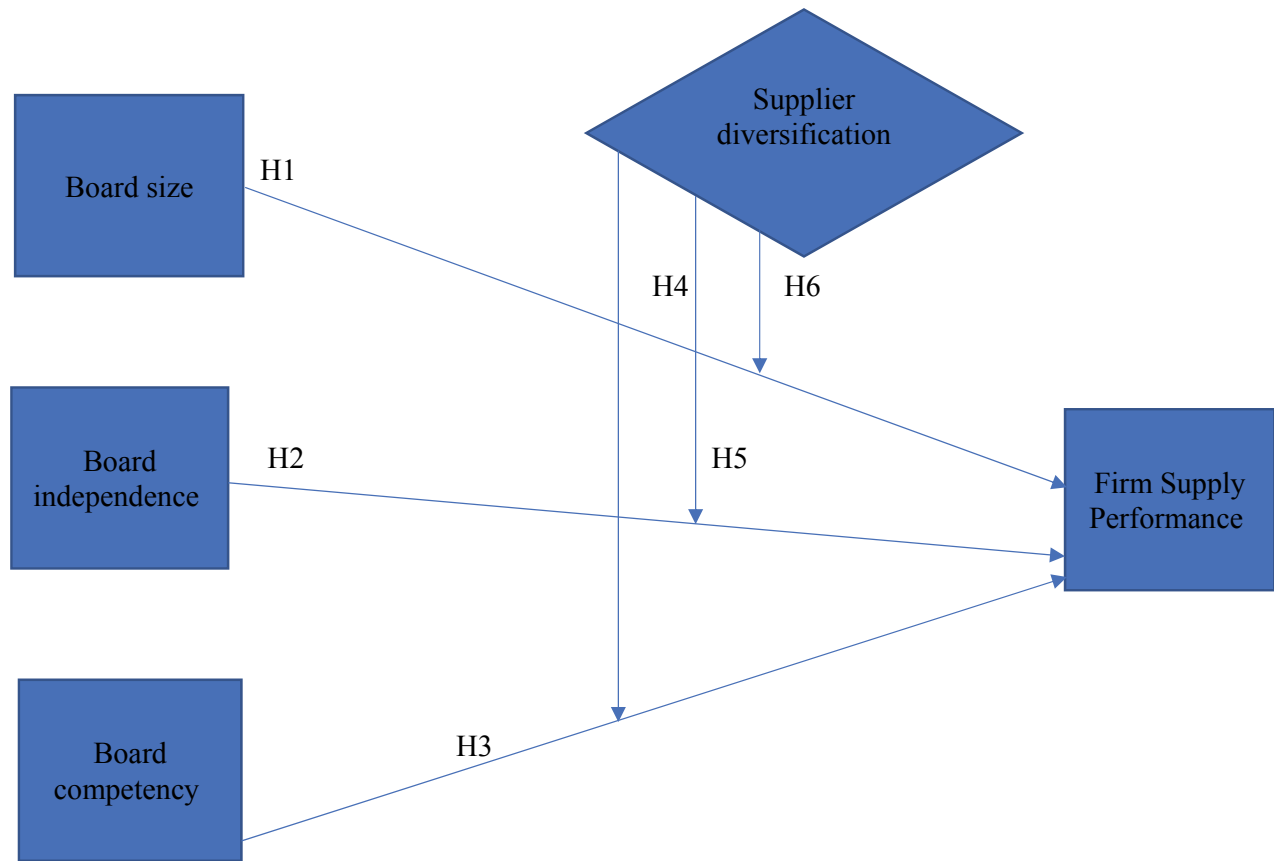
According to Koumanakos (2008), efficient inventory management is one of the key factors that influence the firm's profitability (Koumanakos, 2008). Thus, efficient working capital management ensures optimal inventory level that minimizes cost and maximizes profitability while satisfying customers' demands. Inventories represent a firm's short-term investment which requires efficient management to maximize shareholders value (Savita, 2011). According to Horne and Wachowicz (2004), inventory constitutes the major portion of current assets where a firm holds in the form of either raw materials, work-in-process and finished goods. However, this depends on the nature of the business for a manufacturing firms inventory which can be in all the three forms, (raw materials, work-in-process and finished goods); while for non-manufacturing firms, inventory can only be stock of finished goods. Efficient inventory management involves balancing between the benefits and cost of holding inventory. The question of how much inventory a firm should hold has been extensively discussed in the operational management literature. For example, Koumanakos (2008) elucidates that holding too much inventory involves cash tied up funds in stock which generates no return, increases holding cost and increases the possibility of spoilage, damage and stock loss. However, Baños-Caballero et al. (2012) argue that larger inventories can prevent interruptions in the production process due to stock-outs and loss of business as a result of the scarcity of products and can also reduce supply cost and price fluctuation.

Also, the benefit of holding a stock is that it allows a firm to sell a range of goods which are immediately available to customers at low production costs. There are three motives for holding inventory as follows:

- i) Transactional motive: under this motive, a firm holds inventory to guard against any interruption in the production process and sales operations.
- ii) Precautionary motive: this is to take care of any unforeseen changes in processing rate and delivery time.
- iii) Speculative motive: this is to take advantage of price instability. Similarly, empirical studies on inventory management and the firm's performance relationship have produced mixed results. This indicates the need for more research to be carried out to revalidate and contribute to the existing literature. For example, Deloof (2003) reports that there is a significantly negative relationship between inventory holding period and firm's profitability and suggests that firms can create value for the shareholders by shortening the inventory holding period.

### 3. Conceptual framework

The stakeholder theory of corporate governance, the agency theory, and the resource-based view are used as underpinning theory for the development of the following research model shown in Fig. 1.



**Fig. 1.** Conceptual framework

H<sub>1</sub>: Board Size has a significant impact on the firm supply performance.

H<sub>2</sub>: Board Independence has a significant impact on the firm supply performance.

H<sub>3</sub>: Board Size competency has a significant impact on the firm supply performance.

H<sub>4</sub>: Supplier diversification has a significant impact on the firm supply performance.

H<sub>5</sub>: Supplier diversification moderates the relationship between board size and firm supply performance.

H<sub>6</sub>: Supplier diversification moderates the relationship between Independence and firm supply performance.

H<sub>7</sub>: Supplier diversification moderates the relationship between board competency and firm supply performance.

### 4. Research method

The research method for the current study is cross-sectional design and uses questionnaire technique to collect data from employees on a sample of the industrial firm in Indonesia. In the current study, a quantitative approach has been used, and sample was selected using simple random sampling

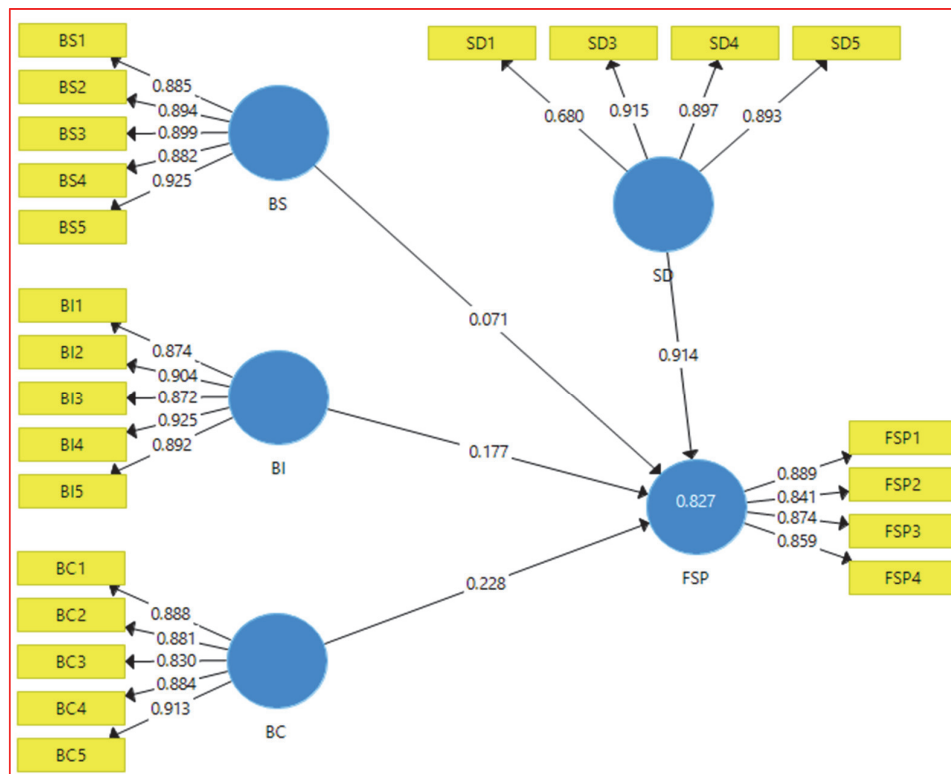
technique. Hair et al. (2012) recommended that usually, sample size should be within 30 to 500 samples. In multiple regression analysis, most of the researchers also recommended that the sample size should be at least ten times as large as the number of variables of the research. Therefore, two hundred fifty 250 sample size was selected to examine the proposed study of this paper.

Data were collected using the 5-point Likert scale. In the current study, respondents are employees of industrial firms in Indonesia by using simple random sampling. Two hundred fifty questionnaires were distributed among employees, and all questionnaires were returned back. All the measures were adopted from prior studies as discussed in the literature. Data were analyzed through SPSS version 23.0 and as well as SEM-PLS 3.0 software.

## 5. Analysis and results

PLS structural equation modelling (SEM) is used in this paper to compute approximately its theoretical model based on Smart PLS 3.0. SEM depends on two very important multivariate techniques such as multiple regression and factor analysis. PLS software uses to analyze the main as well as mediating results of the current study. Moreover, in the analysis of PLS first step is to evaluate the measurement model and this model tells the goodness of measure. Therefore, in PLS two basic criteria are used to evaluate the measurement model, e.g. reliability and validity.

Validity refers to how well results attained from the use of a measure that fits with the theories around which test designed. The validity of the measure confirms using of factor loading analysis. In addition, all items related to a specific variable should load extremely on construct/variable designed to measure that variable. In this study, all items should be 0.5 or above to be considered significant.



**Fig. 2.** Confirmatory Factor Analysis

The measurement model of the current study is shown in Fig. 2. According to factor loading construct value should be greater than 0.7, CR value be greater 0.8, and AVE value should be greater than 0.5. In the current study, all the above three criteria are met. Hence, it shows that our scale convergent is reliable and proves discriminant validity. The factor loading of items of constructs is shown in Table 1.

**Table 1**  
Factor Loadings

	BC	BI	BS	FSP	SD
BC1	0.888				
BC2	0.881				
BC3	0.830				
BC4	0.884				
BC5	0.913				
BI1		0.874			
BI2		0.904			
BI3		0.872			
BI4		0.925			
BI5		0.892			
BS1			0.885		
BS2			0.894		
BS3			0.899		
BS4			0.882		
BS5			0.925		
FSP1				0.889	
FSP2				0.841	
FSP3				0.874	
FSP4				0.859	
SD1					0.680
SD3					0.915
SD4					0.897
SD5					0.893

In the current study, following the partial least square approach, three values; namely composite reliability, convergent validity, Cronbach Alpha, and average variance extracted are used to confirm the reliability and validity issue. The values of Cronbach's Alpha, composite reliability, and average variance extracted (AVE) are shown in Table 2. The results highlight that all values are above the threshold values suggested by the notable literature of Hair et al. (2011)

**Table 2**  
Reliability and Convergent Validity

	$\alpha$	rho A	CR	AVE
BC	0.927	0.93	0.945	0.774
BI	0.937	0.94	0.952	0.799
BS	0.939	0.942	0.954	0.805
FSP	0.889	0.89	0.923	0.75
SD	0.87	0.898	0.912	0.725

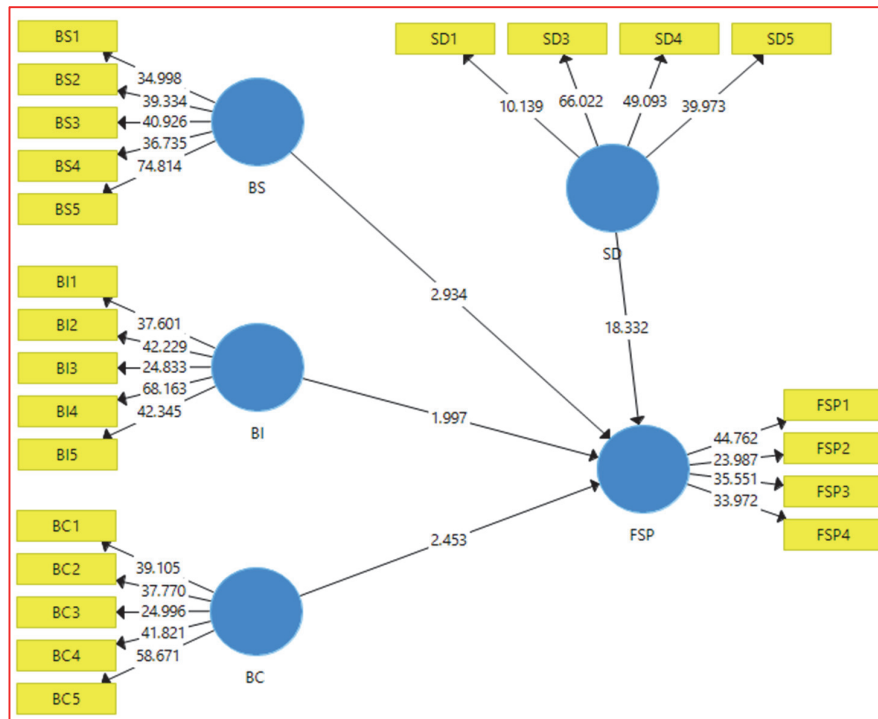
The internal consistency of the framework is accessed by the convergent validity. According to Hair et al. (2011), the internal consistency can be determined by the cross loading. The results of the study are shown in Table 3. The reliability and validity analysis show that there was no serious issue of reliability and validity in the current framework.

**Table 3**  
Cross Loadings

	BC	BI	BS	FSP	SD
BC1	0.888	0.877	0.801	0.583	0.669
BC2	0.881	0.790	0.755	0.584	0.616
BC3	0.830	0.752	0.777	0.528	0.575
BC4	0.884	0.789	0.788	0.617	0.655
BC5	0.913	0.803	0.825	0.636	0.701
BI1	0.789	0.874	0.823	0.562	0.625
BI2	0.849	0.904	0.822	0.566	0.666
BI3	0.763	0.872	0.746	0.470	0.555
BI4	0.836	0.925	0.794	0.581	0.652
BI5	0.833	0.892	0.804	0.529	0.631
BS1	0.812	0.822	0.885	0.536	0.635
BS2	0.773	0.785	0.894	0.585	0.664
BS3	0.810	0.812	0.899	0.536	0.625
BS4	0.777	0.768	0.882	0.569	0.624
BS5	0.850	0.825	0.925	0.629	0.704
FSP1	0.622	0.58	0.600	0.889	0.818
FSP2	0.530	0.487	0.549	0.841	0.743
FSP3	0.610	0.541	0.540	0.874	0.782
FSP4	0.564	0.498	0.522	0.859	0.789
SD1	0.814	0.838	0.790	0.546	0.980
SD3	0.582	0.552	0.609	0.842	0.915
SD4	0.607	0.565	0.586	0.853	0.897
SD5	0.586	0.545	0.575	0.796	0.893

### 5.1. Hypotheses Testing

The structural equation modelling is used to test the hypotheses of the current study. The structural equation model is shown in Fig. 3 below.



**Fig. 3.** Structural Model Assessment

The results of the direct hypotheses of the study are shown in Table 4. The hypotheses of the study are one-tailed, so according to Hair et al. (2012) t-value, more than 1.93 is considered as accepted. In our case, the p-value of all the relations is below 0.5 as well as the t value which is above 1.93. Therefore, all the direct hypothesis is accepted significantly.

**Table 4**

Hypotheses Results without Moderation Effect

	(O)	(M)	(STDEV)	T Statistics	P Values
BC → FSP	0.228	0.228	0.093	2.453	0.015
BI → FSP	0.177	0.165	0.089	1.997	0.046
BS → FSP	0.071	0.071	0.024	2.934	0.007
SD → FSP	0.914	0.906	0.050	18.332	0.000

The results of the moderating effect are shown the Table 5. The t-statistics and p-value are used as a benchmark to claim the significance of the determined relations. The results of the study indicate that the supplier diversification offers positive moderation between board composition and firm supply performance, and between board independence and firm supply performance. Whereas it offers no moderation between the board size and firm supply performance. Hence the H<sub>6</sub> and H<sub>7</sub> are accepted significantly, whereas the H<sub>5</sub> is rejected.

**Table 5**

Moderation Effect

	(O)	(STDEV)	T Statistics	P Values	Decision
BC × SD → FSP	0.121	0.019	6.299	0.000	Moderation
BI × SD → FSP	0.107	0.025	4.275	0.000	Moderation
BS × SD → FSP	0.271	0.194	1.316	0.107	No Moderation



The R-Square value is one of the most important elements of PLS-SEM, which determines the coefficients of the determination of the model. The 0.67 is considered as the substantial value of R-Square value. In our case, the R-square value is 82.7 percent which is very desirable.

**Table 6**

R-Square

	Variance Explained
Firm Supply Performance	0.827

Overall, the results of the current study have provided a great deal of agreement with the hypothesised results of the current study.

## 6. Conclusion

The inventory cost is identified as one of the key factors responsible for the higher production cost. In industrial firms which are the sample of the current study, the inventory is a major portion of working capital. Inventory is defined as any valuable thing which can be sold either directly or indirectly by adding value. The current study has tried to understand the relationship between corporate governance and firm supply performance with supplier diversification as a moderator variable. The supplier diversification is a categorical variable in our case study, which received the value one if the firm has multiple sources and 0, otherwise. It has been argued that the firm with a limited number of suppliers has performed better than the firms with multiple sourcing. However, it is discussed in the literature that single sourcing may lead to excessive cost because of the existing competition among the suppliers. Therefore, the second group of studies argued that any firm to promote healthy competition among suppliers must diversify its supplier network.

In our survey, all the hypotheses  $H_1$ ,  $H_2$ ,  $H_3$  and  $H_4$  were accepted significantly showing that the corporate governance had a significant impact on the firm supply performance. The supplier diversification is in significant direct relationship with firm supply performance, which indicates that the firms with the diversified supplier network outperform the firm with concentrated supplier network. The results of the moderating effect of supplier diversification in the relationship between corporate governance characteristics and firm supply performance are also significant except the effect of the board size.

The current study is contributing in the body of knowledge by many ways; firstly it is among pioneering studies carried out to explore the impact of the corporate governance on the firm supply performance. Secondly, it is also among very few studies, investigating the impact of supplier diversification network on the firm supply performance. Finally, it is among very earlier studies exploring the moderating effect of supplier diversification on the relationship between corporate governance and firm supply performance.

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