

The Effect of Trust Supplier on Firm Performance through Information Sharing and Collaboration in Manufacturing Companies

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Abstract

Information technology enables companies to build good communication and coordination with external partners. The information system owned by the company can provide fast information for management in determining the company's direction. This research proposed a model to investigate the effect of trust suppliers on firm performance through the mediation of information sharing and collaboration. For this purpose, this study postulates nine hypotheses to be examined. Eighty-five (85) manufacturing companies have been surveyed as the sample in this study. Data collection used a questionnaire designed with a five-point Likert scale. Data analysis used smartPLS software to examine the hypotheses. The result indicated that all hypotheses were supported as follows. Trust supplier, information sharing, and collaboration directly affect firm performance. Interestingly, information sharing and collaboration mediate the influence of trust in suppliers on firm performance. These findings provide a managerial implication on how to improve the firm performance by establishing trust in the supplier, sharing information, and developing collaboration between partners. This study also contributes to the current research in supply chain management.

Keywords: Trust Supplier; Information Sharing; Collaboration; Firm Performance.

1. Introduction

The development of information and communication technology provides positive benefits for human welfare, where everyone can take advantage of information and communication technology to improve their quality of life. Information technology used in communicating and coordinating with other partners assists in the decision-making, sharing information, and obtaining the information (Sutabri, 2014). The use of information technology generally consists of hardware containing computer hardware, networking devices, and software that is usually installed in the computer. Information technology is continuously advancing in response to the need to increase security and accuracy in accessing data (Zeng & Koutny, 2019).

The study indicated that information technology supports innovations to strengthen the company's competitiveness (Chen et al., 2019). The company's decision to adopt information technology enables it to integrate internal business functions and external parties, especially suppliers and customers. The company's ability to manage the information benefits the company in determining tactical steps and company strategies in the future (Gunasekaran et al., 2017). The ability of the company's management to understand

the external needs and internal conditions allows the management to benefit from the opportunities.

Moreover, companies can also involve customers in determining new product needs. The company's ability to share information with suppliers according to company needs will build and improve the company's operational excellence in producing efficient and effective products. The company's ability to build relationships with suppliers by sharing information related to its production schedule, orders from company customers, and production capacity will make it easier for suppliers to provide raw and supporting materials with the correct quantity and quality. The working relationship between the company and suppliers impacts the execution of the strategy set by the company's management (Panahifar et al., 2018). Information sharing is expected to have more interaction between companies and suppliers so that companies can also determine strategic decisions and their investment direction (Huang et al., 2020).

The information sharing between the company and suppliers will improve communication and the involvement of both parties in product design. The information-sharing also enables the coordination and building of trust between the two parties. The company's trust with partners is essential to keep the agreed contract, not mislead

partners, and try to overcome their problems together (Kulangara et al., 2016). The trust built by both parties will provide opportunities to collaborate to create competitiveness and create added value for both parties (Arvidsson & Melander, 2020). The trust built by both parties will be able to maintain price and product balance following market demand. Kim et al. (2016) stated that the trust that is built in a relationship between buyers and sellers with a high level of trust. The trust can maintain a balance of product prices and availability for company customers because of the continuity of the supply of materials according to the company's wishes which are adapted to finished products based on customer requests. The trust that the company builds with the suppliers will provide good collaboration. The company will provide the resources and submitted to the supplier to be managed according to the company's needs. Trust between suppliers and buyers will provide business continuity in carrying out daily activities and increase the level of collaboration and company performance (Şahin et al., 2017). The company's collaboration with suppliers must rely on trust with one another to ensure long-term cooperation. Research conducted by Fang et al. (2015) states that the involvement of suppliers, the contribution suppliers in contributing and actively collaborating with companies will provide rapid new product development according to the company's market needs. Tarigan's research (2009) states that the trust the company builds with suppliers will improve communication between the two parties to strengthen the company and suppliers to collaborate effectively.

The company's trust in the supplier will benefit both parties, especially in increasing mutual value. Research conducted by Botwe et al. (2016) stated that the trust built by both parties will be able to provide company performance in reducing the amount of company inventory and accuracy in procuring raw materials. The trust will allow both parties to communicate and be responsible for their respective authorities and duties. The trust given by the company to suppliers by building continuous interaction with both parties can provide the company's supply chain performance in providing products (Capaldo & Giannoccaro, 2015).

The company's performance can increase by being influenced by the quality and accuracy of the information obtained. When the company can provide clear and precise information to the supplier, the supplier can also estimate the needs

that must be met so that the company does not lack that the supply chain is maintained correctly. When the company experiences a change in customer demand, it can be overcome, and the company can maintain a competitive advantage (Li et al., 2014). Improving the company's performance is not only about operations, but also in terms of finance, business processes, products, and the quality of services that can be provided will increase. The exchange of information can also trigger an increase in the insight of various parties and bring significant benefits for companies and suppliers (Wang et al., 2014). Collaboration between companies and suppliers can lead to innovations where this innovation can improve the company's performance, collaboration, and innovation can reduce costs if they can be trimmed (Grekova et al., 2016). The performance of the company itself is a goal that is usually observed and becomes a value for assessing a company's success—the company's ability to build partnerships with suppliers to improve company performance.

The above discussion indicated that in the perspective of supply chain management, the firm performance could be improved by establishing trust in the supplier, information sharing, and collaboration between parties. However, the studies focused only on a direct relationship between two constructs separately. This study proposes a research model which involves four constructs simultaneously. This model examines the effect of trust suppliers on firm performance through information sharing and collaboration. This model is considered new since this model, to the best knowledge of authors, did not exist before. Based on this proposed model, it raised two main groups of research questions to examine as follows. First, whether trust in the supplier, information sharing, and collaboration directly affect the firm performance. Second, whether information sharing and collaboration mediate the influence of trust suppliers on firm performance, the result of this study is expected to provide a managerial implication and theoretical contribution.

2. Literature Review

2.1. Supplier Trust

The company and its suppliers have a close relationship in providing the products needed by the company's customers. Suppliers are essential for companies in increasing competitiveness or

improving company performance. The power of suppliers in bargaining will determine the company's production power because of the ability to provide raw materials and auxiliary materials for the company's operations to produce the number of products and variations of the company's products. Companies and suppliers must build mutual trust to enhance mutual competitiveness in the supply chain. Research conducted by Botwe et al. (2016) says that trust is one of several social constructions, an element of social reality. Naturally, this is caused by the relationship between social actors, individuals, and groups. The company has also trusted key suppliers to manage warehouses owned by the company and can also access data on company needs as predictions of raw material needs can be determined independently by suppliers. Trust that is built between buyers and suppliers can keep the promises that have been agreed upon and always work collaboratively and support each other in dealing with problems (Kulangara et al., 2016). Companies build trust with suppliers to be able to provide promised materials to support supply chain agility and supply chain performance (Şahin et al., 2017). The ability of suppliers to provide raw materials for the company will increase the company's flexibility in meeting customer demands. The role of suppliers is significant for companies to increase the company's operational productivity by increasing the quantity and quality of new products because of developing companies and existing products (He et al., 2014). The indicators used in the trusted supplier are keeping promises, negotiating equally, helping each other in dealing with problems so as not to mislead and trusting each other between partners (Kulangara et al., 2016). Based on the above arguments, the following hypotheses are determined:

H₁: Trust supplier affects firm performance.

H₂: Trust supplier influence collaboration.

H₃: Trust supplier affect collaboration.

2.2. Information Sharing

Information sharing activities are often associated with supply chain activities. Information sharing itself means sharing information where individuals or groups share information to benefit from the information for business actors. Information is essential because by obtaining information quickly and accurately, business actors can make important decisions appropriately (Kaya & Azaltun, 2012). For example, sharing information with suppliers in

manufacturing schedules and procurement of materials in warehouses can coordinate well with suppliers. As a result, suppliers and companies can communicate and coordinate the needs and availability of materials and products in the supply chain flow so that they can provide when needed at an affordable cost and increase the level of service to customers (Chengalur-Smith et al., 2012). The primary purpose of sharing information with partners is to integrate data to achieve the company's operational efficiency and the effectiveness of the strategies that have been applied to the supply chain flow (Wong et al., 2020). According to research by Huang et al. (2020), when suppliers of goods and companies share information, both parties will benefit from each other. As a result, they can cut the costs needed, and the performance between suppliers and companies can be more efficient. The indicators set in this study adopted the measurement items carried out by Chengalur-Smith et al. (2012) sharing forecasting with suppliers, sharing production schedule information with suppliers, providing information about changes that may occur, and sharing inventory data access rights with other parties. Based on this argument, a hypothesis is formulated:

H₄: Information sharing influences firm performance.

H₅: Information sharing affects collaboration.

2.3. Collaboration

The business environment in the current era is snowballing, which creates a very competitive business environment so that businesspeople often collaborate to increase the company's competitiveness with other companies and to take care of each other due to a very competitive business environment. Companies can involve innovations in product development, process development, and the development of various raw materials according to company needs. Panahifar et al. (2018) Collaboration in the supply chain is a practical approach or way to help companies or organizations face challenges in a competitive business environment and survive in the business world. Collaboration in the supply chain itself is related to the processes carried out in the supply chain. It is also related to building relationships between the two parties to help each other achieve common goals and benefits (Chakraborty, Bhattacharya, & Dobrzykowski, 2014). A study on the Hotel industry in Surabaya, Indonesia, indicated that collaboration with suppliers could

enhance the firm performance of the Hotels (Tanuwijaya et al., 2021). Indicators of Collaboration include supplier and being the basis for future business, jointly developing strategic goals with partners, holding meetings or discussions, mutual participation with companies to avoid misperceptions, and companies providing information to each other about their business strategy (Panahifar et al., 2018). In addition, a survey on the food and beverage industry in Surabaya, Indonesia, indicated that supply chain integration, which is one of the collaborations, could improve the firm performance (Setiabudi et al., 2021). However, in this study, the indicators of collaboration are set by adopting Tarigan et al. (2020); among others, suppliers solve problems faced by the company, share ideas between the two parties, share the risks they face, and work very well with each other. Based on this description, the following hypothesis is proposed. H₆: Collaboration influences firm performance.

2.4. Company Performance

Company performance is the achievement obtained by the company in a certain period and is measured continuously. The company determines the performance measurement according to the company's needs and the measurement method that the company's management has determined according to their needs. The company's performance appraisal needs always to be done so that the company can know the current performance conditions, previous performance conditions, and future performance planning conditions and compare with the performances of other companies in the same sector and are the company's competitors. The company's performance can be said to be the company's ability to achieve the goals that have been set (Chong et al., 2011). Organizational performance can be represented by the company's financial and non-financial performance. Every company wants the company's performance to run well.

Performance measurement set (Tarigan et al., 2021) in the context of supply chain integration to improve operational performance is defined as product quality, fulfillment of customer demands, customer satisfaction, on-time delivery, and flexibility. Operational performance indicators are measured by meeting customer needs, the company's ability to cope with market changes, on-time delivery, providing quality products, reducing costs, and reducing inventory (Rajaguru & Matada, 2019). Based on the explanation

above, the researchers set research indicators that can be used to measure firm performance in this study, namely the quality of the products produced by the company, reduced costs, increased production, and decreased inventory levels.

The research model can be determined based on the explanation above, which is shown in Figure 1.

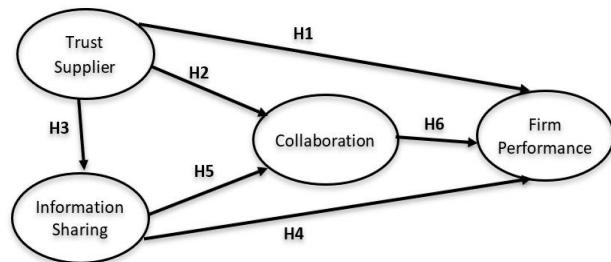


Figure 1. Research Model

Figure 1 demonstrates the relationship reflecting the direct hypotheses formulated in the literature review. In addition to the direct relationship, this study also proposed three indirect hypotheses.

- H₇: Trust suppliers indirectly influence firm performance through information sharing.
- H₈: Trust suppliers can influence firm performance through collaboration.
- H₉: Trust supplier indirectly affect firm performance through information sharing and collaboration.

3. Methods

The research method used in this paper is quantitative. The population used in this study are manufacturing companies in East Java and, as a unit of analysis, manufacturing companies that already have data integration between departments in the company and key suppliers have access to the necessary information needs. Sugiyono (2017, p. 81) states that the sample is part of the number and characteristics possessed by the population. From the existing population, several managers and employees who work in manufacturing companies are determined to be sampled in the study. The method of selecting the sample used for this research is non-probability sampling, using purposive sampling. The characteristics of the sample used in this study are respondents who meet the requirements to answer the research objectives. First, namely large industries with a workforce of more than 99 people. Second, companies that have used information technology as indicated by data integration between

departments in internal manufacturing companies. Third, companies that have given access rights to information technology systems with specific menus and limited authorization to suppliers, in the sense that suppliers can see the availability of goods in the company's warehouse and the company's material needs. Researchers took data from June 2020 to January 2022. The results of the distribution of respondents were shared by email and WhatsApp so that 85 manufacturing companies were obtained. The data analysis technique used in this research is a quantitative analysis using SEM (Structural Equation Modeling) or Structural Equation Modeling using smartPLS software version 2.0 (Partial Least Square). PLS is a variant-based structural equation analysis (SEM) that can simultaneously test the measurement and structural models (Jogiyanto & Abdilah, 2009). Respondents who are male are 53 respondents (62%) and 32 female respondents (38%). The data shows that the number of male employees is more than female employees in the company's operations. Work in company operations interacts more directly with the workforce, so many companies prioritize the male gender over the female gender, especially in the production and warehouse divisions and those related to the company's supply chain function.

4. Results

Descriptive analysis indicated that respondents' profiles were based on working experience. Most employees have been working for more than years, with as many as 71 respondents (91%). This shows that respondents have enough working experience to understand the company strategy and activities, allowing them to respond accurately to the questionnaire. In addition, the characteristics of respondents are based on the departments involved in the company's operations and supply chain management. For example, respondents by the department found that almost all operational departments communicated and collaborated between departments in carrying out supply chain management to improve operational performance.

The further analysis investigates the construct measurement validity by looking at the factor loading of each item of the indicator. An item is considered valid when the facto loading value exceeds 0.5. The analysis result demonstrated that the loading value on the supplier trust measurement item obtained the lowest value on the mutual trust between partners (TS4) of 0.653

> 0.5. Then, all measurement items on the supplier trust are considered valid. The second variable, information Sharing, has the minimum factor loading value on the sharing production schedule item with suppliers (IS2) of $0.615 > 0.5$. Furthermore, the collaboration construct has the lowest value of $0.691 > 0.50$ for the item of suppliers participating in solving problems (Co1). Lastly, the firm performance has the lowest value of $0.657 > 0.50$ for the item cost is reduced by the partnership (FP2).

In addition. the square root of average variance extracted (AVE) compared with the correlation between constructs indicated discriminant validity. The result indicated that the value of the square root of AVE for each construct is greater than the correlations between constructs. Therefore, all measurement items of each construct are considered valid against discriminant validity. The AVE value for collaboration is 0.543, supplier trust is 0.566, information sharing is 0.581, and firm performance is 0.552. The four variables meet the requirements that have been set. The reliability test is shown in Table 1.

Table 1. Research Variable Reliability Test

Variable	Cronbach's Alpha	rho_A	Composite Reliability
Collaboration	0.716	0.713	0.825
Firm Performance	0.729	0.734	0.831
Information Sharing	0.763	0.816	0.845
Supplier Trust	0.741	0.769	0.837

Reliability assessment is required to assure that the block indicators of each construct are reliable. Indicators are considered reliable when the value of Cronbach's Alpha, rho_A, and composite reliability exceed 0.70 as recommended cut-off value. Table 1 shows that the values of Cronbach's alpha, rho_A, and composite reliability for each variable are greater than 0.70. Hence, all indicators of each construct are considered reliable, and further analysis can proceed.

The inner model assessment examines the R-Square and the hypothesis's acceptance. The R square value for collaboration is 0.242, which means that supplier trust and information sharing can explain the variance of collaboration by 24.2%. The R-Square information-sharing value of 0.155 means that the percentage of the amount of information sharing that can be explained by Supplier trust is 15.5%. The R-Square value for the firm performance of 0.480 means that supplier

trust, information sharing, and collaboration can explain the variance of firm performance, Information Sharing, and collaboration by 48%. The research hypothesis testing is shown in Figure 1 and Table 2, and Figure 2.

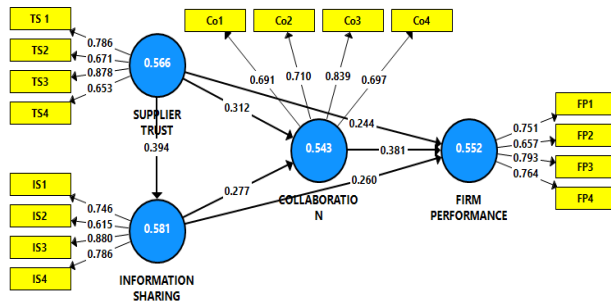


Figure 2. Research Model and Analysis Result

Table 2. Direct Hypothesis Test Results

Direct Effect	Path Coefficient	T Statistics	P-Values
Supplier Trust → Firm Performance (H1)	0.244	2.477	0.014
Supplier Trust → Collaboration (H2)	0.312	2.512	0.012
Supplier Trust → Information Sharing (H3)	0.394	4.847	0.000
Information Sharing → Firm Performance (H4)	0.260	2.400	0.017
Information Sharing → Collaboration (H5)	0.277	2.262	0.024
Collaboration → Firm Performance (H6)	0.381	3.737	0.000

Table 3. Indirect Hypotheses Testing Result

Indirect Path	Path Coefficient	T Statistics	P Values
Supplier Trust → Information Sharing → Firm Performance (H7)	0.102	2.007	0.045
Supplier Trust → Collaboration → Firm Performance (H8)	0.119	2.021	0.044
Supplier Trust → Information Sharing → Collaboration → Firm Performance (H9)	0.109	1.909	0.057

Table 2 and Table 3 indicate the result of hypotheses testing, including direct and indirect hypotheses. A hypothesis is supported by empirical data when the t-statistics value exceeds 1,96 or the p-value less than 0.05. In Table 2, it is found that all direct hypotheses are supported as all the t-statistics values exceed 1.96, and the p-value is less than 0.05. Meanwhile, in Table 3, one

indirect hypothesis (H9) is not supported since the t-statistics value is less than 1.96, and the p-value exceeds 0.05.

5. Discussion

The first hypothesis, supplier trust affects firm performance, is supported, indicating a significant influence of Supplier trust on firm performance in the manufacturing industry. Helping each other deal with problems and keep promises enables the suppliers to provide the correct quantity and quality of raw materials and be directly involved in the company's production process. As a result, the company's trust in suppliers can impact company performance with increased production and decreased inventory levels. Therefore, the findings in the study are that supplier trust can significantly increase firm performance in the manufacturing industry. The results of this study support the results of research conducted by Panahifar et al. (2018), Olorunniwo and Li (2010), Chengalur-Smith et al. (2012), and Wu et al. (2014), which state that suppliers are trustable to improve Firm Performance in the manufacturing industry in 177 manufacturing companies listed on the Taiwan Stock Exchange Corporation.

The second hypothesis testing also indicated that supplier trust affects collaboration in the manufacturing industry. Helping each other deal with problems and the supplier keep promises (TS1) impacts collaboration on both sides with the supplier to bear the risks faced by the company. Therefore, suppliers' participation in partnership results from the company's high trust in suppliers. The results of this study support the results of Panahifar et al. (2018), Kulangara et al. (2016), and Wu et al. (2014), which state that suppliers are trustable to increase collaboration in 177 manufacturing companies listed on the Taiwan Stock Exchange Corporation. It is found that the third hypothesis proved that there is a significant influence on supplier trust in information sharing in the manufacturing industry. The company's ability to build trust in suppliers shown by helping each other in dealing with problems (TS3), and the ability of suppliers to keep promises (TS1), have an impact on increasing information sharing. This finding can be seen from the supplier's accuracy in providing raw materials with the required quantity and quality by knowing the company's needs through the access rights granted. This study is in line with research which states that trust suppliers can increase information

sharing (Chen et al., 2011; Panahifar et al., 2018; Kulangara et al., 2016; Wu et al., 2014).

Furthermore, the fourth hypothesis test result indicates a significant influence of information sharing on firm performance in the manufacturing industry. Information sharing between companies and suppliers by sharing access to inventory data with suppliers and providing information about changes that may occur has an impact on increasing performance by increasing production and decreasing inventory levels. The results of this study support the results of research that state that information sharing can improve Firm Performance (Şahin et al., 2017; Kulangara et al., 2016; Zhang et al., 2018). Moreover, the fifth hypothesis stating the influence of information sharing on collaboration is significantly supported. There is a significant influence of information sharing on collaboration in the manufacturing industry. Sound information sharing between companies and suppliers by sharing access to inventory data with suppliers and providing information about changes that may occur has an impact on the supplier in bearing the risks faced by the company and sharing ideas between the two parties. This study supports the results of research that states that Information Sharing can improve the collaboration of the manufacturing industry with suppliers (Wang et al., 2014; Chengalur-Smith et al., 2012; Li et al., 2014; Wong et al., 2020 Chengalur-Smith et al., 2012). The last direct hypothesis, the sixth hypothesis, is also supported by empirical data. There is a significant influence of collaboration on firm performance in the manufacturing industry. Solid collaboration between companies and suppliers, with suppliers participating in taking on the risks faced by the company, and sharing ideas between the two parties, has an impact on increasing performance with an increase in production and a decrease in inventory level. The results of this study support the research proposed by Grekova et al. (2016) that collaboration can improve firm performance, and Ahin et al. (2017) also support by stating that collaboration can improve firm performance.

Besides the direct hypotheses, this study has developed three indirect hypotheses, and the analysis result shows that two of them were supported, and one was rejected. The seventh hypothesis, supplier trust indirectly affects firm performance through information sharing, is supported. There is a significant influence of supplier trust on firm performance through information sharing in the manufacturing industry.

Furthermore, the eight hypothesis testing result shows supplier trust indirectly affects firm performance through collaboration. There is a significant influence between supplier trust on firm performance through collaboration in the manufacturing industry. However, the last hypothesis is not supported. Therefore, supplier trust does not significantly affect firm performance through information sharing and collaboration in the manufacturing industry.

5.1. Managerial Implications

Based on the research result, trust in suppliers is essential in improving the firm performance. Trust in suppliers encourages suppliers to support their buyers with the best service. Besides, the company needs to practice information sharing with its partners, enabling the supplier to cope with the company's needs in serving the customer. The organization also needs to establish an excellent collaboration with its partners. Moreover, collaborating with a mutual agreement allows the company to enhance its capability to cope with the customer needs and improve its competitive advantage.

5.2. Theoretical Contributions

This study contributes to the existing theory, namely the mediation of information sharing and collaboration toward the relationship between trust supplier and firm performance.

6. Conclusions

The initial purpose of this study is to investigate the effect of trust suppliers on firm performance through the mediating role of information sharing and collaboration with the study population is manufacturing companies in East Java, Indonesia. For this purpose, nine hypotheses have been proposed to be examined. The result showed that eight of nine hypotheses were supported, and one hypothesis was rejected. Trust supplier affects firm performance (H1), Collaboration (H2), and information sharing (H3). Moreover, information sharing affects the firm performance directly (H4) and Collaboration (H5). Collaboration affects firm performance (H6). In addition, trust supplier indirectly affects firm performance through information sharing (H7) and Collaboration (H8). However, trust suppliers did not indirectly affect firm performance through information sharing and collaboration.

This study's findings provide an insight for manufacturing managers to enhance the firm performance by encouraging trust in the supplier, practicing the information sharing between partners, and setting sound collaboration with external partners. This study also enriches the current research in supply chain management, particularly the mediating role of information sharing and collaboration in the influence of trust supplier on firm performance.

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