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Effects of Supplier–Manufacturer Relationships on Supply-Chain Performance of Manufacturing Industries in Indonesia

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Abstract

The present study describes the relationships between commitment, communication, satisfaction, trust, relationship quality with suppliers, and supply-chain performance. The population of the study was manufacturing companies in Indonesia. Respondents were the chief executive officers or corporate secretaries or the designated managers involved in strategic decision making. Samples were taken by using a proportional area random sampling technique. Structural Equation Modeling (SEM) was used for analysis. Results of both direct and indirect testing of hypothesis indicated two hypotheses of positive and significant effects and nine hypotheses of positive but insignificant effects. Those hypotheses of positive and significant effects were the direct effects of trust on supply-chain performance and the direct effects of relationship quality on supply chain performance.

Abstrak

Dampak Hubungan antara Penyalur dan Produsen terhadap Kinerja Rantai Pasokan Industri Manufaktur di Indonesia. Kajian ini bertujuan untuk menggambarkan hubungan antara komitmen, komunikasi, kepuasan, kepercayaan, serta kualitas hubungan antara penyalur dan produsen dan kinerja rantai pasokan. Populasi di dalam penelitian ini adalah perusahaan-perusahaan manufaktur di Indonesia. Responden di dalam penelitian ini adalah pejabat-pejabat eksekutif tertinggi, sekretaris-sekretaris perusahaan, atau manajer-manajer yang ditunjuk dan terlibat di dalam proses pembuatan kebijakan strategis perusahaan. Sampel diambil menggunakan teknik sampel acak wilayah proporsional. *Structural Equation Modeling* (SEM) atau Pemodelan Persamaan Struktural digunakan di dalam analisis. Hasil dari pemeriksaan langsung atau pun tidak langsung terhadap hipotesis-hipotesis menunjukkan bahwa dua hipotesis bersifat positif dan berdampak signifikan, sedangkan sembilan hipotesis bersifat positif tetapi berdampak tidak signifikan. Dua hipotesis yang bersifat positif dan berdampak signifikan itu adalah dampak langsung dari kepercayaan terhadap kinerja alur persediaan dan dampak langsung dari kualitas hubungan antara penyalur dan produsen terhadap kinerja alur persediaan.

Keywords: commitment, communication, performance, relationship quality, satisfaction, supply chain, trust

1. Introduction

The growth of national manufacturing industry in Indonesia reached 6.40% in 2012. This figure was higher than that of the economic growth (GDP) of 6.23% for the same year. The growth of the manufacturing industry was supported by the high level of investments in the industrial sectors and domestic consumption. These sectors contributed up to 20.85% of the national GDP. The Ministry of Industry prioritizes downstream industries based on agribusiness, oil and gas industries, and mineral materials, as well as improvement programs of HR-based competitiveness of industries, the domestic

market, and exports, and SME development programs. In 2014, the main goal of the development of the manufacturing industry is to boost the added value of domestic industries through downstream industries based on natural resources, control of domestic markets, and export for domestic industrial products [1].

Global competition demands manufacturing industry to provide consumers with the right products at the right time and at economical costs. Product availability and economical selling prices can only occur if there is a sound coordination between the manufacturing industry and the parties within the supply chain. Coordination

among the parties within the supply chain does not only involve that of inventory. Product supply shortages will result in lost sales, while excessive inventory will lead to a product buildup and rising costs of inventory maintenance. Supply chain management (SCM) represents the best solution to improving productivity of different companies, such as manufacturers with its partners or suppliers as well as with consumers in order to realize an interrelated integration [2].

SCM can be run effectively if the suppliers are capable of fulfilling the market needs flexibly. Maintaining a good relationship with suppliers constitutes one of the important things that should be considered by manufacturers. The success of a partnership or cooperation should be based on a good relationship with partners [3]. Creating a good supply-chain performance requires several indicators that support the realization of the good supply-chain performance. These indicators, among other things, include trust, company-supplier communication, flexibility/ease of adjusting situations, and the strong commitment to cooperation. A good quality of these indicators will enable the supply chain to achieve the best performance [4].

Krause *et al.* [5] analyzed the factors influencing distributors' commitment to boost long-term relationships with suppliers. The variables were satisfaction, trust, commitment, and long-term relationship. Results showed that trust had a positive and significant effect on long-term relationships with suppliers. Heikkilä [6] analyzed the effects of relationship quality on the supply-chain performance. The variables were trust, commitment, relationship quality, and suppliers' performance. Results indicated that trust and commitment had positive effects on relationship quality and supply-chain performance. Relationship quality and supply-chain performance can be improved through the five indicators of trust; commitment had a positive effect on improving relationship quality and supply-chain performance; and relationship quality had a positive effect on improving supply-chain performance. Based on the above theoretical and empirical descriptions a model could be developed in order to explain the relationship between trust, commitment, communication, satisfaction, and relationship quality with suppliers and supply-chain performance.

2. Methods

Population in the present study was manufacturing companies in Indonesia. Respondents were the leadership of the manufacturing companies (chief executive officers or corporate secretaries or designated managers) involved in strategic decision making. A sample of 120 respondents of manufacturing companies was taken from the five major industrial centers of Surabaya, Sidoarjo, Mojokerto, Gresik, and Pasuruan in East Java. The proportional area

random sampling technique was used since each of the centers of industry had a different number of manufacturing companies. Sample size was determined by the use of the analytical tool of Structural Equation Modeling (SEM). Variables were measured by using a 5-point Likert scale. Respondents' response was their perceptions of the statements.

Hypothesis proposed in this study were:

Hypothesis 1: Commitment has a positive and significant effect on trust. This hypothesis is supported by Kwon and Suh [7], Chen [8], and Aghamohammadi *et al.*, [9].

Hypothesis 2: Communication has a positive and significant effect on trust. This hypothesis is supported by Sheptim [10], Kannan and Tan [11], Kwon and Suh [12], Grossman [13], Wilson and Nielson [14], and Cetindamar *et al.*, [15].

Hypothesis 3: Satisfaction has a positive and significant effect on trust. This hypothesis is supported by Grossman [13] and Kwon and Suh [12].

Hypothesis 4: Commitment has a positive and significant effect on relationship quality. This hypothesis is supported by Peterson *et al.*, [16], Wong and Sohal [17], Kwon and Suh [12], and Fauzi, [18].

Hypothesis 5: Communication has a positive and significant effect on relationship quality. This hypothesis is supported by Peterson *et al.*, [16] and Fauzi [18].

Hypothesis 6: Satisfaction has a positive and significant effect on relationship quality. This hypothesis is supported by Bianchi and Saleh [19], Payan *et al.*, [20], Kwon and Suh [12], Morrow *et al.*, [21] and Bep [22].

Hypothesis 7: Trust has a positive and significant effect on relationship quality. This hypothesis is supported by Sheptim [10], Kannan and Tan [11], Grossman [13], Peterson *et al.*, [16], Fauzi [18], Bianchi and Saleh [19], Payan *et al.*, [20], Lee and Dawes [23], Atkinson and Butcher [24] and Brashear *et al.*, [25].

Hypothesis 8: Trust has a positive and significant effect on supply-chain performance. This hypothesis is supported by Kwon and Suh [12], Bianchi and Saleh [19], Payan *et al.*, [20] and Morrow *et al.*, [21].

Hypothesis 9: Relationships quality has a positive and significant effect on supply-chain performance. This hypothesis is supported by Bhasin [26], Li *et al.*, [27] and Agus [28].

The structural equation model that expresses the causal relationship among variables is:

$$Y_3 = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 Y_1 + \beta_5 Y_2 + z_1 \quad (1)$$

The measurement model that determined the indicators that measured the latent variables are:

$$X_1 = \lambda_i X_1 + e_i, i = 1, \dots, 4 \quad (2)$$

$$X_2 = \lambda_{4+i} X_2 + e_{4+i}, i = 1, \dots, 4 \quad (3)$$

$$X_3 = \lambda_{8+i} X_3 + e_{8+i}, i = 1, \dots, 4 \quad (4)$$

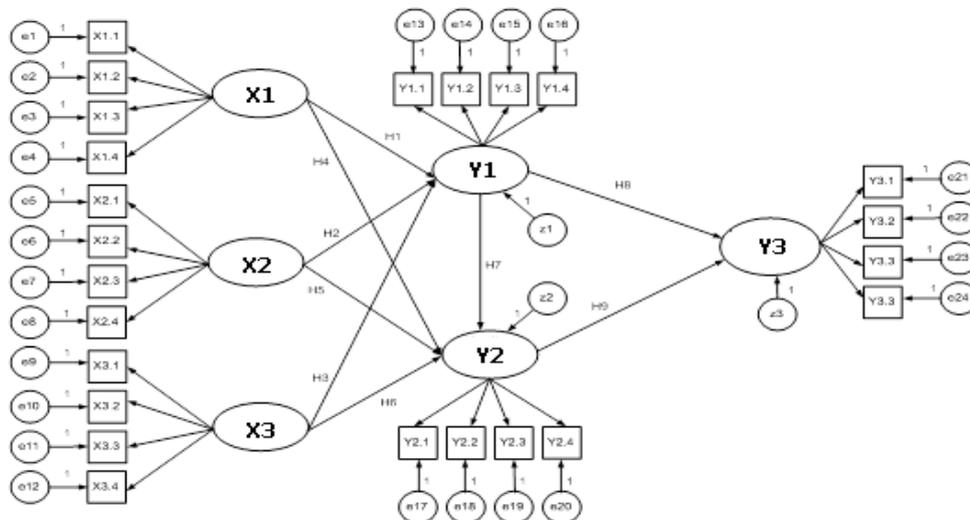
$$Y_1 = \lambda_{12+i} Y_1 + e_{12+i}, i = 1, \dots, 4 \quad (5)$$

$$Y_2 = \lambda_{16+i} Y_2 + e_{16+i}, i = 1, \dots, 4 \quad (6)$$

Y₃: supply-chain performance, Y₂: relationship quality, Y₁: trust, β₁, β₂, β₃, β₄: regression weights, X₁: commitment, X₂: communication, X₃: satisfaction, z_i:

disturbance term, λ: loading factor and e: error, and i: index.

The structural equation model was tested by the use of a fit index. If the model did not adequately fit, then it was to be modified by adding or removing paths of relationship so that the chi-square values would decrease by the index value [29]. The research model is shown in Figure 1.



Notes: X_{1,1} = affective commitment; X_{1,2} = continuance commitment; X_{1,3} = normative commitment; X_{1,4} = fidelity in a relationship; X_{2,1} = frequency communication; X_{2,2} = freuens bidirectional; X_{2,3} = open frequency; X_{2,4} = medium of communication; X_{3,1} = payment policy; X_{3,2} = return policy; X_{3,3} = policy delivery; X_{3,4} = satisfaction of service; Y_{1,1} = credibility; Y_{1,2} = accountability; Y_{1,3} = experience; Y_{1,4} = quality of goods offered; Y_{2,1} = maintenance relationship; Y_{2,2} = short-term gains; Y_{2,3} = long-term focus; Y_{2,4} = enthusiasm relationship; Y_{3,1} = reliability; Y_{3,2} = responsiveness; Y_{3,3} = cost; Y_{3,4} = flexibility.

Figure 1. The Research Model

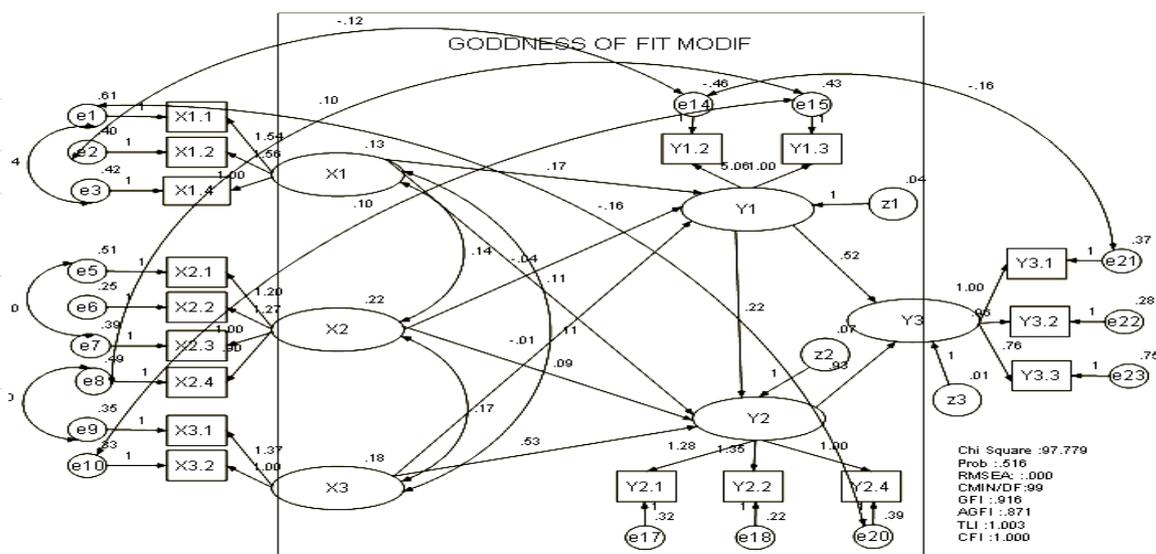


Figure 2. Results of SEM Analysis of the Final-Stage Model

3. Results and Discussion

Results of the goodness-of-fit testing of the overall final-stage model are shown in Figure 2. Hypothesis testing was conducted by partially testing each path of direct effects based on the results of structural equation modeling (SEM) analysis. Indirect effects constitute a byproduct of the direct effects. Hypothesis testing of a direct effect was based on the value of $CR > 1.96$ and $P < 0.05$, meaning a significant effect. Results of the research hypothesis testing are shown in Table 1.

Results of the first hypothesis testing indicated that commitment had an insignificant effect on trust. The success of a company with its partners in building a good commitment would be able to improve trust in the relationships, despite an insignificant effect in this study. This was due to the sub-maximal coordination of both sides to fulfill their rights and obligations. This result was inconsistent with that of Grossman [13] and Wong and Sohal [17], which suggested that commitment had a significant effect on trust. Thus, the established commitment had an effect on trust in building a relationship. The higher the suppliers' commitment to establish an ongoing relationship with buyers, the higher the buyers' trust in the suppliers would be. The higher the commitment to the suppliers, the higher the trust in the suppliers would be.

Results of the second hypothesis testing showed that communication did not have a significant effect on trust. Communications made so far by the suppliers and manufacturing companies in Indonesia have not been maximal, leading to inability to establish trust between the two sides. This was caused by the lack of openness of both parties in communicating. Analysis of respondents' frequency indicated that the indicator of open communication had a smaller percentage of 'strongly agree' response than the others. This result

was inconsistent with that of Sheptim [10], Kannan and Tan [11], and Kwon and Suh [12], which suggested that communication had a significant effect on trust. Communication had an effect on trust in building a relationship. A study by Sheptim [10] showed that the better the partner's communication with the company, the higher the company's trust would be. The higher the intensity of communication between suppliers with retailers, the stronger the trust between the two sides would be. The better and more frequent the suppliers' communication with the buyers, the higher the buyers' trust in the suppliers. These conflicting results were due to the difference in, among others, the object of study and respondents' state. It led to difference in results.

Results of the third hypothesis testing showed that satisfaction did not have a significant effect on trust. Suppliers' and manufacturing companies' current policies and services so far in Indonesia have not provided satisfaction, leading to inability to establish mutual trust between the two sides. This was caused by the suppliers' less responsive policy to the returned products. Analysis of respondents' frequency suggested that the indicator of returned product policy had a smaller percentage of 'strongly agree' response than the others.

This result was inconsistent with that of Grossman [13] and Kwon and Suh [12], which showed that satisfaction had a significant effect on trust, meaning that satisfaction had an effect on trust in building a relationship. Retailers' satisfaction would have an effect on trust in the company. The higher the suppliers' ability to serve the buyers satisfactorily, the higher the buyers' trust in the suppliers. Satisfaction played an important role in establishing trust. These conflicting results were due to the difference in, among others, the object of study and respondents' state. It led to difference in results.

Table 1. The Direct and Indirect Relationships

Independent variable	Dependent variable	Path coefficient Direct Effect		
		Standard coefficient	<i>p-value</i>	Result
Commitment	Trust	0,311	0,438	Non Significant
Communication	Trust	-0,098	0,772	Non Significant
Satisfaction	Trust	-0,012	0,961	Non Significant
Commitment	Relationship quality	0,101	0,28	Non Significant
Communication	Relationship quality	0,102	0,821	Non Significant
Satisfaction	Relationship quality	0,546	0,168	Non Significant
Trust	Relationship quality	0,107	0,167	Non Significant
Trust	Performance	0,238	0,000	Significant
Relationship quality	Performance	0,880	0,035	Significant

Results of the fourth hypothesis testing indicated that commitment did not have a significant effect on relationship quality. Commitment currently established by the suppliers and manufacturing companies in Indonesia has been good; however, it has not affected relationship quality between the two sides. This was due to the lack of attention to the fullest rights and responsibilities of both parties. This result was inconsistent with that of Peterson *et al.*, [16] and Wong and Sohal [17], which suggested that commitment had a significant effect on relationship quality. It means that commitment had an effect on relationship quality. The higher the distributors' commitment, the closer the relationship would be. The higher the distributors' commitment to the suppliers, the greater the desire to establish long-term relationships with the suppliers would be. Commitment had a positive effect on relationship quality. The higher the suppliers' commitment, the more the distributors' trust would increase.

Results of the fifth hypothesis testing showed that communication did not have a significant effect on relationship quality. Communication between the suppliers and manufacturers has been developed, but it has not affected the relationship quality between the two sides. It was caused by a lack of openness in communication, which led to suspicion and reduced relationship quality between the two sides. This result did not support that of Peterson *et al.*, [16] and Fauzi [18], which suggested that commitment had a positive and significant effect on communication. Communication had an effect on relationships quality. The higher communication with distributors, the more closely the long-term cooperation would be. The higher the intensity of the suppliers' communication, the more closely the suppliers' relationships with the buyers would be.

Results of the sixth hypothesis testing showed that satisfaction did not have a significant effect on relationship quality. Suppliers' and manufacturing companies' current policies and services so far in Indonesia have provided satisfaction, but it has not affected the relationship quality between the two sides. This was due to a poor return goods policy that led to dissatisfaction of either side, which ultimately reduced the levels of relationship quality. This result did not support that of Kwon and Suh [12], Bianchi and Saleh [19], Payan *et al.*, [20], Morrow *et al.*, [21] and Bep [22], which showed that satisfaction had a significant effect on relationship quality. Satisfaction had an effect on relationship quality. Distributors' satisfaction with salespersons' service had an effect on the desire for a relationship.

Results of the seventh hypothesis testing showed that trust did not have a significant effect on relationship

quality. Trust built over the years by suppliers and manufacturers in Indonesia have been strong but this has not affected the quality of the close relationship between the two sides. This was due to the lack of credibility of both sides, leading to a poor quality of cooperation. This result was inconsistent with that of Sheptim [10], Kannan and Tan [11], Grossman [13], Peterson *et al.*, [16], Fauzi [18], Bianchi and Saleh [19], Payan *et al.*, [20], Lee and Dawes [23], Atkinson and Butcher [24] and Brashear *et al.*, [25], which suggested that trust had a significant effect on relationship quality. The better the company partners' communication, the higher the trust in the company would be. The greater trust in the suppliers, the greater the buyers' desire to establish a long-term relationship. The higher the retailers' trust in the company, the higher the retailers' desire to establish a long-term relationships with the suppliers would be. Trust can have an important impact in determining relationship quality at a higher level. In order to achieve a long-term retailer–company relationship the company should be able to maintain retailers' trust in the company. The higher the trust in the distributors, the more closely the long-term cooperation would be. This means that trust had an effect on relationship quality.

Results of the eighth hypothesis testing indicated that trust had a significant effect on supply-chain performance. Trust built over the years by suppliers and manufacturers has been strong enough to have an effect on improving supply-chain performance. This result supported that of Bianchi and Saleh [19], Payan *et al.*, [20], Kwon and Suh [12], and Morrow *et al.*, [21], which showed that trust had a significant effect on supply-chain performance. This means that trust has an effect on supply-chain performance. With a maintained trust in the suppliers, supply-chain performance will run smoothly.

Results of the ninth hypothesis testing showed that relationship quality had a significant effect on supply-chain performance. The quality of the relationships built over the years by suppliers and manufacturers has been strong enough to have an effect on improving supply-chain performance. This result supported that of Bhasin [26], Li *et al.*, [27] and Agus [28], which suggested that relationship quality had a significant effect on supply-chain performance. This means that relationship quality had an effect on supply-chain performance. With a maintained quality of relationships with the suppliers, supply-chain performance will run smoothly. Results of hypothesis testing are shown in Figure 3.

A factor affecting the companies' trust in the suppliers was commitment to the suppliers. Results of this study demonstrated that the companies' trust in the suppliers influenced by commitment constituted an important step in improving supply-chain performance with the

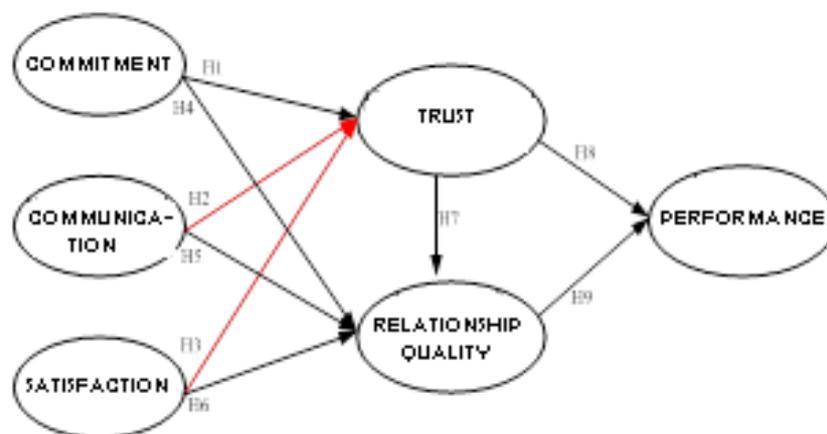
suppliers. Empirical evidence showed that commitment had an effect on supply-chain performance through trust, but it was insignificant, as shown by the results of the indirect effects of commitment on supply-chain performance through trust of 0.0740. Result of the relationship was positive. Commitment with the indicator of continuant commitment was the most dominant indicator for the variables of companies' trust in the suppliers. This showed that the suppliers' commitment continuant would be able to increase the companies' trust in the suppliers. In other words, the suppliers' continuant commitment had an indirect effect on improving supply-chain performance between the companies and the suppliers.

The factor of the companies' trust in the suppliers did not have an effect on communication with the suppliers. Results of this study demonstrated that the companies' communication-affected trust in the suppliers has not been able to improve supply-chain performance. In this study, empirical evidence showed that communication did have a significant effect on supply-chain performance through trust, as shown by the results of the indirect effect of commitment on supply-chain performance through trust of -0.0234. Result of the relationship was negative.

Communication with the indicator of communication media was the least dominant indicator for the variables of the companies' trust in the suppliers. The suppliers' communication media have not been maximized, leading to inability to be able to increase the companies' trust in the suppliers. The suppliers' communication media did not have an indirect effect on increasing supply-chain performance of the companies and the suppliers.

The factor of the companies' trust in the suppliers had no effect on satisfaction with the suppliers. This result demonstrated that the companies' satisfaction-affected trust in the suppliers has not been able to improve supply-chain performance. Satisfaction did not have a significant effect on supply-chain performance through trust as shown by the results of the indirect effects of satisfaction on supply-chain performance through trust of -0.0029. Result of the relationship was negative. Communication with the indicator of goods delivery policy was the least dominant indicator for the variables of the companies' trust in the suppliers. The suppliers' goods delivery policy has not been maximized, leading to inability to increase the companies' trust in the suppliers. The suppliers' goods delivery policy did not have an indirect effect on increasing supply-chain performance of the companies and the suppliers.

The factor affecting company-supplier relationship quality was commitment to the suppliers. Results of this study demonstrated that the commitment-affected quality of relationship between the companies and the suppliers was an important step in improving supply-chain performance with suppliers. Commitment had an effect on supply-chain performance through relationship quality, despite the insignificance, as shown by the results of the indirect effects of commitment on supply-chain performance through quality relationship of 0.0889. Result of the relationship was positive. Commitment with the indicator of continuant commitment was the most dominant indicator for the variables of company-supplier relationship quality. Suppliers' continuant commitment would be able to improve company-supplier relationship quality.



Note:
 Red line: no significant effect
 Black line: significant effect.

Figure 3. Hypothesis Testing

Suppliers' continuant commitment had an indirect effect on an increasing supply-chain performance of the companies and the suppliers.

The factor affecting the quality of the companies' relationship with the suppliers was the companies' commitment to the suppliers. Results of this study demonstrated that communication-affected quality of relationship between the companies and the suppliers was an important step in improving supply-chain performance with the suppliers. Communication had an effect on supply-chain performance through relationship quality, but it was insignificant. The indirect effect of communication on supply-chain performance through relationship quality was 0.0898. Result of the relationship was positive. The variable communication with the indicator of a two-way communication was the most dominant indicator for the variables of the quality of relationships between the companies with the suppliers. The suppliers' two-way communication would be able to improve the quality of the companies' relationships with the suppliers. The suppliers' two-way communication had an indirect effect on increasing company–supplier supply-chain performance.

The factor affecting the quality of the companies' relationship with the suppliers was satisfaction with the suppliers. Results of this study demonstrated that the satisfaction-affected quality of the companies' relationships with the suppliers was an important step in improving supply-chain performance with the suppliers. Satisfaction had an effect on supply-chain performance through relationship quality, but it was insignificant. It was shown by the results of the indirect effects of communication on supply-chain performance through relationship quality of 0.0898. Result of the relationship was positive. Satisfaction with the indicator of payment policy was the most dominant indicator for the variables of the quality of the companies' relationship with the suppliers. The suppliers' payment policy would be able to improve the quality of the companies' relationship with the suppliers. The suppliers' payment policy had an indirect effect on increasing company–supplier supply-chain performance.

4. Conclusions

Results of hypothesis testing, both directly and indirectly, indicated two hypotheses of significant effects and nine hypotheses of positive but insignificant effects. Hypotheses of positive and significant effect were those of direct effects of trust on the supply-chain performance and direct effects of relationship quality on supply-chain performance. Hypotheses of positive, but insignificant, effects were those of direct effects of commitment on trust, direct effects of commitment on relationship quality, direct effects of communication on

relationship quality, direct effects of satisfaction on relationship quality, direct effects of trust on relationship quality, indirect effects of commitment on supply-chain performance through trust, indirect effects of commitment on supply-chain performance through relationship quality, indirect effect of communication on supply-chain performance through relationship quality, and indirect effects of satisfaction on supply-chain performance through relationship quality.

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