THE RELATIONSHIP BETWEEN PRESSURE, MANAGEMENT, MARKET INFORMATION AND SUPPLY CHAIN IN SUSTAINABLE LOGISTIC OPERATIONS

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ABSTRACT

The objective of this study is to examine the relationship between pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations. The mediation effect of supply chain process was also examined in this study. Data were collected from the employees of logistic companies in Indonesia. Questionnaire was used for the data collection. Partial Least Square (PLS) was used for data analysis. Results of the study shows that pressure of demand and inadequate management has negative effect on sustainable logistic performance. Pressure of demand has negative effect on sustainable logistic performance. Market information has positive effect on sustainable logistic performance. Additionally, supply chain process has positive effect on sustainable logistic performance.

Keywords: Pressure of Demand, Inadequate Management, Market Information, Supply Chain, Sustainable Logistic Operations

INTRODUCTION

In the current era of competition, sustainability is key to compete as well as it is key to get success in the market (Thongrawd, Bootpo, Thipha & Jermsittiparsert, 2019). The companies having short term performance cannot get success because of high competition. Therefore, it is really key for the companies to attain sustainability in performance (Haseeb, Hussain, Kot, Androniceanu & Jermsittiparsert, 2019). As the sustainability in performance is considered as major element by number of previous investigations (De, Chowdhury, Dey & Ghosh, 2020). A considerable level of sustainability in performance is always required in the business activities to enhance the level of success. Because in this era of high competition among the businesses, it is really important to have a consistent performance because consistent performance is required to compete with the other businesses in the market.

To attain sustainability in the performance, the sustainability in operations is always required. High sustainability in the operations is always required for the companies. As the sustainability in operations finally support the sustainability in the performance. Therefore, operation sustainability has key contribution to the business activities to enhance the overall performance. Number of previous scholars mentioned that operational sustainability among the operational activities of the business is key (Suriyanti, Firman, Nurlina, Ilyas & Putra, 2020; Upadhyay, Bankoti & Rai, 2016). All the companies have specific operations to attain the key objectives of the companies. To achieve the key objectives, the operations of companies required sustainability. Sustainability in quality of operational activities has major role in the

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performance. Along with the other companies, sustainability in the operations also has key value in logistic companies.

Logistic has vital importance for the firms as well as for the nation. There are number of operations in each country which are based on the sustainable logistic operations. Key value of logistic operations has key importance for the firm. However, low level of sustainability in operations of logistic has negative role in the performance of the companies. Particularly, it has negative effect on newly developed firm as they always required efficient services to compete in the market and overcome the market competition along with the number of factors. Therefore, growing importance of sustainable logistic operations always play vital contribution to number of activities in companies. This is also important evidence from the previous studies that logistic sustainability is key (Mangla, Sharma, Patil, Yadav & Xu, 2019; Ditkaew, Pitchayatheeranart & Jermsittiparsert, 2020; Minashkina & Happonen, 2020).

In Indonesia, logistic sustainability is also much important. High level of performance by number of other companies always needs sustainable operations. Indonesian logistic operations also have significant value for the companies as well as it is also important for logistic companies' performance. The growth of Indonesian logistic sector is increasing. As it is given in Figure 1 which showing the estimated increase in Indonesian logistic sector from 2018 to 2024 which is showing 13.15% growth. It has significant growth in the logistic companies, however, to achieve this growth, companies required sustainable operations. Increase in the operational sustainability will help to achieve the required growth from 2018 to 2024. As the sustainability and logistic performance is crucial relationship with each other's (Bag, Wood, Xu, Dhamija & Kayikci, 2020; Raut et al., 2019).

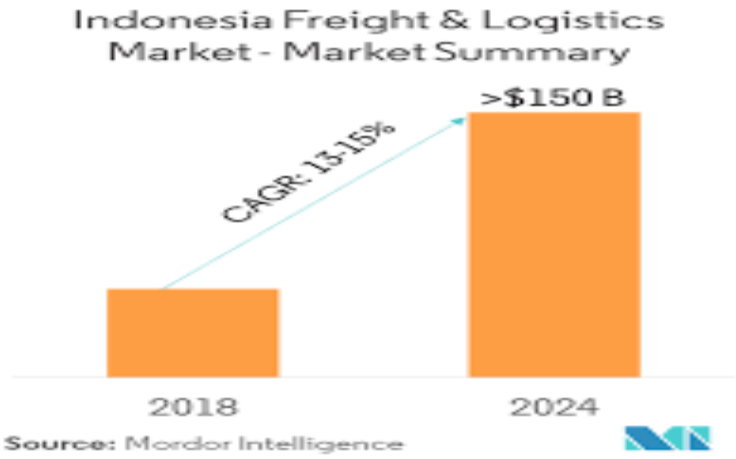

FIGURE 1
INDONESIAN LOGISTIC

To enhance the sustainability in the logistic operations, handling of pressure is most important. Management always faces pressure due to the high demand from the customers or high demand from various other countries. In the pressure, the companies or staff cannot work accurately due to the high pressure. Therefore, pressure of demand shows adverse effect on the supply chain as well as sustainable logistic operations. Secondly, management also has major role which causes to decrease or increase in the sustainability in operations. Therefore, inadequate management lead to the negative effect on the sustainability of operations. Furthermore, market information also playing a vital role in the operations sustainability.

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Information from the market related to the competitors as well as customers has major importance for the logistic companies. As the knowledge or information from the market is vital in the business activities which is valuable to improve the performance (Abualoush, Obeidat, Tarhini & Al-Badi, 2018).

Therefore, objective of this study is to examine the relationship between pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations. Number of studies carried out by number of researchers on sustainable logistic (Cannas, Ciccullo, Cigolini, Pero & Ruci, 2018; Osmani & Zhang, 2017), however, the relationship which is discussed by the current study is not debated in previous investigation. Furthermore, this study also examined the mediation effect of supply chain which is a key contribution.

LITERATURE REVIEW

Logistic industry has powerful sources to participate among different industries through transportation of various goods to continue the normal operations. Along with the facilitation of various other industries, it also has vital role to deliver various products to the customers. Therefore, logistic sector has important participation for individuals and companies. Especially, logistic has more importance where the transportation of goods from one place to other place is common. Logistic also has great participations to deliver goods to the communities in the country where the countries have high population. As Indonesia has huge population, therefore, the load on logistic competition is also high. Logistic industry remains busy all the time and requires high quality services to the people. As competition is increasing among the companies, therefore, to provide high quality service is most vital. In this direction, companies always remain in touch to examine different strategies. Therefore, this study is also providing number of ways to improve the performance of logistic companies.

According to the current study, sustainability is the major source to achieve higher performance. Increase in the performance is majorly based on the sustainability in the operations. As the performance and sustainability has important connection (Cherian et al., 2019; Hummel & Schlick, 2016). Improvement in the sustainability of operations has the ability to increase the performance of logistic companies. Therefore, operations of the companies must be on priority. However, the operations of the company also depend on various factors. Increase or decrease in the quality of operations is also based on several factors. First, the sustainability of operations is based on the pressure of demand. As the Indonesia has huge population, that is why the pressure on logistic industry is also very high. Pressure has significant role in the operations sustainability and supply chain. Second, management of the logistic companies has major participation in operations sustainability. For instance, inadequate management of the companies also has major role in this aspect. Inadequate management has negative role in the promotion of sustainable operations. Moreover, information from the market is key to the success of every business. Every business always requires information from the market to make strategies. Most of the strategic moves are based on the information from the market. As the market information has vital role in performance (Banalzwaa & Abdullah, 2017). Further to this, the current study examined the mediating role of supply chain. As both the logistic and supply chain has major relationship with each other's (Ul-Hameed, Mohammad, Shahar, Aljumah & Azizan, 2019). Figure 2 shows the relationship between pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations.

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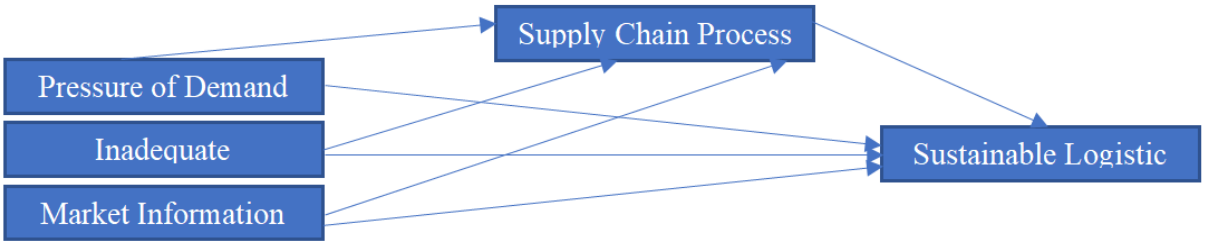

FIGURE 2
THEORETICAL FRAMEWORK OF THE STUDY SHOWING THE RELATIONSHIP BETWEEN PRESSURE OF DEMAND, INADEQUATE MANAGEMENT, MARKET INFORMATION AND SUPPLY CHAIN IN SUSTAINABLE LOGISTIC OPERATIONS

Supply Chain and Sustainable Logistic Operations

A supply chain is a link between a firm as well as its suppliers to harvest and allocate an exact product to the final buyer. This network comprises diverse activities, people, entities, knowledge/information, and resources. The supply chain system has relationship with the suppliers as well as distributors of the company. Better supply chain has the ability to increase the operations effectiveness. Supplier provides the material to the company to make new products and distributor distribute the finished goods to the customers as well as to the other companies. This has major relationship with the company operations. There is a connection between supply chain and logistics. Both are the mandatory for each other's. Logistic operations are not possible without the supply chain. Moreover, supply chain is not possible without the logistic operations. Therefore, supply chain and logistic operations has crucial role with each other's (Azmat & Kummer, 2020; Gunasekaran & Kobu, 2007; Nadeem, Alvi & Iqbal, 2018). So, to enhance the sustainable logistic operations, the supply chain process has central role. Increase in the supply chain effectiveness increases the sustainable logistic operations.

Hypothesis 1: Supply chain process has positive effect on sustainable logistic operations.

Pressure of Demand, Supply Chain Process and Sustainable Logistic Operations

Pressure has important role in the supply chain. Increase or decrease in the pressure has important role on supply chain. As the performance is also based on the demand and supply. Generally, customers demand for the specific goods to deliver on a specific place which sometimes shows pressure in the company. As Indonesia is a high populated where quick supply chain activities are required. Various stakeholders demand specific amount of goods for the consumer. For instance, supplier has its own demand to fulfill the orders of the people. The supplier brings the orders from the market and distributed the goods. Furthermore, various companies also contact with the companies to order goods. In that case due to many orders, the pressure on the companies increase which effect on the supply chain process. It also shows effect on the sustainable logistic operations. Due to increase in pressure, the operations of the company become disturbed which shows negative effect on sustainability of the operations? Several studies highlighted the relationship among the demand, supply and supply chain (Giri & Masanta, 2020; Hosseini, Nouri, Choi & Ebrahimi, 2019; Zhou et al., 2019). Therefore, pressure of supply has relationship with supply chain and sustainable logistic operations.

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Hypothesis 2: Pressure of demand has negative effect on sustainable logistic operations.
Hypothesis 3: Pressure of demand has negative effect on supply chain process.

Inadequate Management, Supply Chain Process and Sustainable Logistic Operations

Management is the most important part of any organizations. Management is based on various employees of the organization which run the organization in positive directions. Management is based on several stages, for instance, top management included the directors of the companies which keep checking the company operations and responsible of making operation in accurate way. After those other managers such as HR managers recruit the new employees of the welfare of the company. Moreover, the lower level managers such as managers at firm level or any branch level are the responsible of all the operations in the unit. All these managers have vital contribution to the company success and sustainable operations. The whole management should be competent to handle all the operations in an accurate way. As management of the company and performance has crucial relationship (Santoso, Purwanto & Asbari, 2019; Shad, Lai, Fatt, Klemeš & Bokhari, 2019). However, inadequate management has negative role in the operations of the company. It is one of the dangers for the company which has negative effect on the performance. Management also has relationship with the supply chain activities. Inadequate management also shows the negative role in the supply chain. As the inadequate management has negative effect for the performance (Bianco et al., 2019). Finally, inadequate management has negative effect on supply chain and sustainable logistic operations.

Hypothesis 4: Inadequate management has negative effect on sustainable logistic operations.
Hypothesis 5: Inadequate management has negative effect on supply chain process.

Market Information, Supply Chain Process and Sustainable Logistic Operations

Furthermore, this study examined the role of market information in supply chain and sustainable logistic operations. Information from the market always shows key importance for the companies. This information includes information from the suppliers. Suppliers provide valuable information which shows positive role in the innovative activities and increase the quality of the operations and services as per the customer demand. Supplier is one of the major sources of information related to the competitors. The business always required competitor information enhances the quality of these businesses to compete in the market. Furthermore, supplier also provides the valuable information related to the market. To know the marketing trend is most important for the companies to enhance the performance. Generally, companies make strategies by examining the market that where market is going into the profit in coming days or will remain at the same point and it will involve in loss. Therefore, information from the supplier is really important. Additionally, company also gets information from supplier which provides the information to make the customized products. Making of customized products also shows positive role in success and performance. Therefore, information from the supplier and customers has major importance for the performance (Amoako-Gyampah, Boakye, Adaku & Famiyeh, 2019; Iqbal & Hameed, 2020). Consequently, information from the market has vital role in supply. Supply chain activities are majorly dependent on the market information. Generally, market information has positive role in supply chain process which is beneficial for the logistic operations. Market information also has relationship with the sustainable logistic operations. Operations effectiveness is also influenced by the information from the market. As previous studies highlighted that the information from the market has vital importance for the business (Na, Kang & Jeong, 2019). Hence, following hypotheses are supposed;

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Hypothesis 6. Market information has positive effect on sustainable logistic operations.
Hypothesis 7. Market information has positive effect on supply chain process.

Mediation Effect of Supply Chain Process

Mediation effect or indirect effect of supply chain is examined in the current study which is justified with the help of (Baron & Kenny, 1986). In this study, the mediating role of supply chain was examined between inadequate management and sustainable logistic operations. Moreover, the mediating role of supply chain was examined between pressure of demand and sustainable logistic operations. Finally, the mediating role of supply chain was examined between market information and sustainable logistic operations. These mediation hypotheses are given below;

Hypothesis 8: Supply chain process mediates the relationship between pressure of demand and sustainable logistic operations.
Hypothesis 9: Supply chain process mediates the relationship between inadequate management and sustainable logistic operations.
Hypothesis 10: Supply chain process mediates the relationship between market information and sustainable logistic operations.

RESEARCH METHODOLOGY

A survey questionnaire was used for data collection. Hence, quantitative research approach is followed in the current study. Data were collected from the employees of logistic companies in Indonesia. Questionnaire was used for the data collection in which a 5-point Likert scale was used. After designing a questionnaire, simple random sampling was used for data collection and 500 questionnaires were distributed. Finally, 270 valid responses were used through PLS to get the final results.

RESEARCH FINDINGS

Table 1 shows the missing value in the data (Aydin & Şenoğlu, 2018). In third column, the missing value is given which is showing zero in each row. It indicates that the collected data in response to each variable has no missing value. Outlier is given in column six and seven which is also showing that data has no outlier.

Table 1
DATA STATISTICS

	No.	Missing	Mean	Median	Min	Max	SD	Kurtosis	Skewness
PD1	1	0	3.513	4	1	5	1.173	-0.977	-0.291
PD2	2	0	3.425	3	1	5	1.081	-0.455	-0.317
PD3	3	0	3.663	4	1	5	1.204	-0.554	-0.589
PD4	4	0	3.6	4	1	5	1.136	-0.259	-0.618
IM1	5	0	3.6	4	1	5	1.221	-0.902	-0.447
IM2	6	0	3.562	4	1	5	1.223	-0.639	-0.565
IM3	7	0	3.612	4	1	5	1.09	-0.182	-0.59
IM4	8	0	3.737	4	2	5	1.009	-0.959	-0.339
MI1	9	0	3.85	4	1	5	1.174	-0.247	-0.789

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MI2	10	0	3.862	4	2	5	0.997	-0.692	-0.566
MI3	11	0	3.7	4	1	6	1.1	-0.892	-0.179
MI4	12	0	3.712	4	2	6	1.051	-0.888	-0.251
SCP1	13	0	3.8	4	1	5	0.992	0.239	-0.757
SCP2	14	0	3.725	4	1	5	1.072	-0.584	-0.418
SCP3	15	0	3.812	4	1	5	1.014	0.458	-0.786
SCP4	16	0	3.812	4	1	5	1.014	0.458	-0.786
SCP5	17	0	3.75	4	1	5	1.135	-0.213	-0.693
SCP6	18	0	3.725	4	1	5	1.084	0.114	-0.749
SLO1	19	0	3.6	4	1	5	1.2	-0.811	-0.462
SLO2	20	0	3.65	4	1	5	1.097	-0.138	-0.653
SLO3	21	0	3.775	4	2	5	1.012	-0.986	-0.341
SLO4	22	0	3.837	4	1	5	1.167	-0.226	-0.783
SLO5	23	0	3.837	4	1	5	1.018	-0.298	-0.68
SLO6	24	0	3.712	4	1	6	1.086	-0.798	-0.236
SLO7	25	0	3.75	4	2	6	1.031	-0.843	-0.244

After the examining of missing value and outlier in Table 1, it is confirmed that data is accurate to proceed further. This study used Partial Least Square (PLS) for data analysis. It is given in Figure 3 that all the items have factor loadings which is also given in Table 2. It is examined through confirmatory factor analysis (CFA) (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014; Hair, Ringle & Sarstedt, 2013; Hair, Sarstedt, Pieper & Ringle, 2012; Henseler et al., 2014) which is indicating that pressure of demand is measured through four scale items, inadequate management is measured through four items. Market information is measured through four items and few items were deleted because of low factor loadings. All the items having factor loadings below 0.4 were deleted and other were retained. Sustainable logistic operations were measured through seven scale items and all items have factor loadings more than 0.4. Hence, all the items have factor loadings above 0.4 for all the variables, namely; pressure of demand, inadequate management, market information, supply chain and sustainable logistic operations.

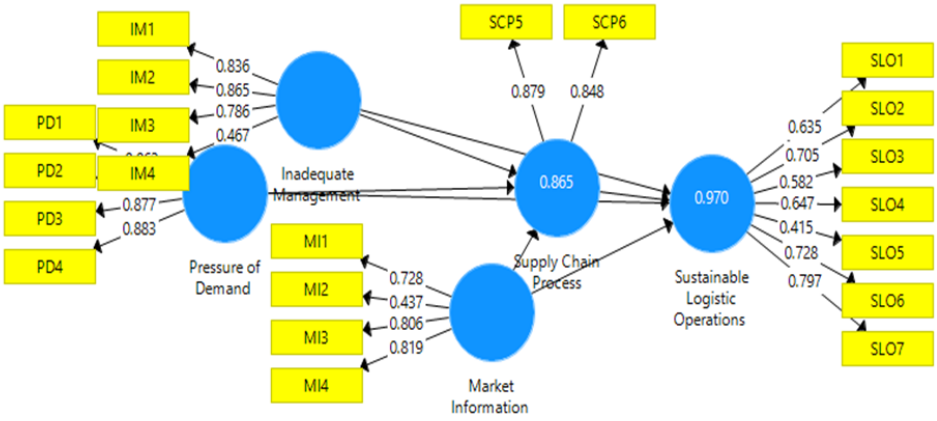

FIGURE 3
MEASUREMENT MODEL

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Table 2 FACTOR LOADINGS					
	Inadequate Management	**Market Information**	**Pressure of Demand**	**Supply Chain Process**	**Sustainable Logistic Operations**
IM1	0.836				
IM2	0.865				
IM3	0.786				
IM4	0.467				
MI1		0.728			
MI2		0.437			
MI3		0.806			
MI4		0.819			
PD1			0.563		
PD2			0.467		
PD3			0.877		
PD4			0.883		
SCP5				0.879	
SCP6				0.848	
SLO1					0.635
SLO2					0.705
SLO3					0.582
SLO4					0.647
SLO5					0.415
SLO6					0.728
SLO7					0.797

Further to the CFA for factor loadings, the current study examined the Composite Reliability (CR) as well as discriminant validity (AVE). Discriminant validity is also given in Table 4 with the help of cross-loadings (Fornell & Larcker, 1981). Both CR and AVE must be above 0.7 and 0.5 (Hair, Hollingsworth, Randolph & Chong, 2017). Table 3 shows that CR for pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations is above 0.7. Moreover, Table 3 shows that AVE for pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations is also above 0.5.

Table 3 RELIABILITY AND CONVERGENT VALIDITY				
	Alpha	**rho_A**	**CR**	**AVE**
Inadequate Management	0.727	0.762	0.836	0.571
Market Information	0.763	0.72	0.799	0.51
Pressure of Demand	0.741	0.712	0.71	0.59
Supply Chain Process	0.76	0.765	0.855	0.746
Sustainable Logistic Operations	0.768	0.793	0.835	0.528

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Table 4
CROSS-LOADINGS

	Inadequate Management	Market Information	Pressure of Demand	Supply Chain Process	Sustainable Logistic Operations
IM1	0.836	0.335	0.632	0.601	0.623
IM2	0.865	0.432	0.658	0.579	0.623
IM3	0.786	0.461	0.697	0.657	0.686
IM4	0.767	0.504	0.35	0.292	0.567
MI1	0.644	0.728	0.306	0.305	0.63
MI2	0.251	0.437	0.155	0.15	0.411
MI3	0.386	0.806	0.418	0.407	0.699
MI4	0.576	0.819	0.493	0.403	0.775
PD1	-0.025	0.118	0.563	-0.064	0.045
PD2	-0.03	0.076	0.367	-0.034	0.032
PD3	0.734	0.476	0.877	0.798	0.633
PD4	0.669	0.424	0.883	0.839	0.612
SCP5	0.67	0.432	0.839	0.879	0.617
SCP6	0.585	0.368	0.764	0.848	0.545
SLO1	0.807	0.358	0.658	0.617	0.835
SLO2	0.781	0.471	0.701	0.668	0.805
SLO3	0.446	0.507	0.321	0.289	0.582
SLO4	0.383	0.703	0.352	0.375	0.847
SLO5	0.261	0.411	0.168	0.184	0.415
SLO6	0.419	0.796	0.433	0.44	0.728
SLO7	0.599	0.799	0.499	0.433	0.797

Finally, this study examined the relationship between different variables. In this process, the relationship between pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations was examined. The effect of pressure of demand was examined on supply chain. The effect of inadequate management was also examined on supply chain. Moreover, the direct effect of market information was examined on supply chain. Finally, the direct effect of supply chain was examined on sustainable logistic operations. Additionally, the direct effect of pressure of demand, inadequate management, market information and supply chain were examined on sustainable logistic operations. Results are given in Table 5 which are obtained through PLS structural model as shown in Figure 3 (Hameed, Basheer, Iqbal, Anwar & Ahmad, 2018; Henseler & Chin, 2010; Henseler et al., 2014; Henseler, Ringle & Sarstedt, 2015; Henseler, Ringle & Sinkovics, 2009). Results shows that inadequate management has no effect on supply chain. As there is insignificant effect of inadequate management on supply chain. Market information also has insignificant effect on supply chain. However, pressure of demand has significant effect on supply chain. Furthermore, inadequate management has significant influence on sustainable logistic operations. Pressure of demand also has significant influence on sustainable logistic operations. Similarly, market information has significant role in sustainable logistic operations. Finally, it is found that supply chain has positive effect on sustainable logistic operations. Increase in supply chain increases the sustainable logistic operations.

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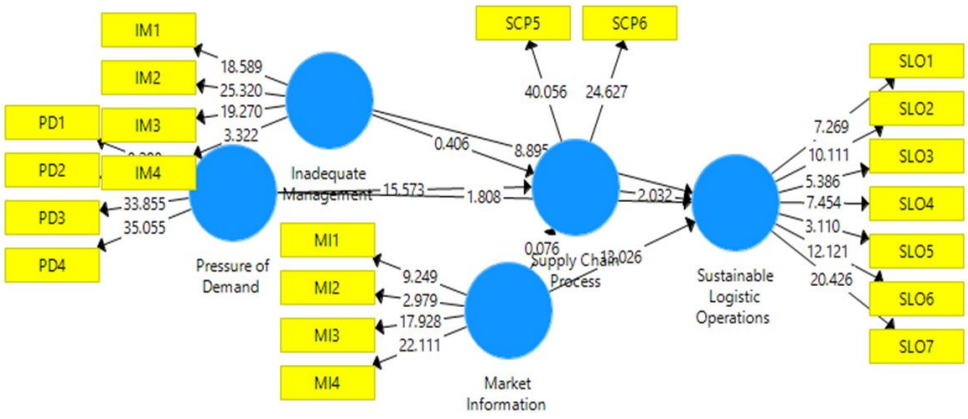

FIGURE 4
STRUCTURAL MODEL

Table 5
DIRECT EFFECT RESULTS

	(O)	(M)	SD	t Statistics	P Values
Inadequate Management -> Supply Chain Process	-0.029	-0.004	0.072	0.406	0.342
Inadequate Management -> Sustainable Logistic Operations	-0.465	-0.456	0.052	8.895	0
Market Information -> Supply Chain Process	-0.005	-0.006	0.06	0.076	0.47
Market Information -> Sustainable Logistic Operations	0.634	0.636	0.049	13.026	0
Pressure of Demand -> Supply Chain Process	-0.955	-0.925	0.061	15.573	0
Pressure of Demand -> Sustainable Logistic Operations	-0.185	-0.156	0.102	1.808	0.036
Supply Chain Process -> Sustainable Logistic Operations	0.213	0.185	0.105	2.032	0.021

Above discussion and results shows the direct effect of pressure of demand, inadequate management, market information and supply chain on sustainable logistic operations. The next section shows the indirect effect of supply chain process. The mediating role of supply chain was examined between inadequate management and sustainable logistic operations. The mediating role of supply chain was examined between pressure of demand and sustainable logistic operations. Finally, the mediating role of supply chain was examined between market information and sustainable logistic operations. Results are given in Table 6 in which the (Preacher & Hayes, 2008) approach was followed. It is found that mediating role of supply chain between inadequate management and sustainable logistic operations is not significant with t-value 0.401. The mediating role of supply chain between pressure of demand and sustainable logistic operations is significant with t-value 2.099. The mediating role of supply chain between market information and sustainable logistic operations is not significant with t-value 0.83. Finally, r-square value is above 0.67 which strong (Chin, 1998) and showing that pressure of demand, inadequate management, market information and supply chain process is expected to have strong change in sustainable logistic operations.

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Table 6 INDIRECT EFFECT RESULTS					
	(O)	**(M)**	**SD**	**t Statistics**	**P Values**
Inadequate Management -> Supply Chain Process -> Sustainable Logistic Operations	-0.006	0.001	0.016	0.401	0.344
Market Information -> Supply Chain Process -> Sustainable Logistic Operations	0.001	-0.002	0.012	0.083	0.467
Pressure of Demand -> Supply Chain Process -> Sustainable Logistic Operations	0.203	0.17	0.097	2.099	0.018

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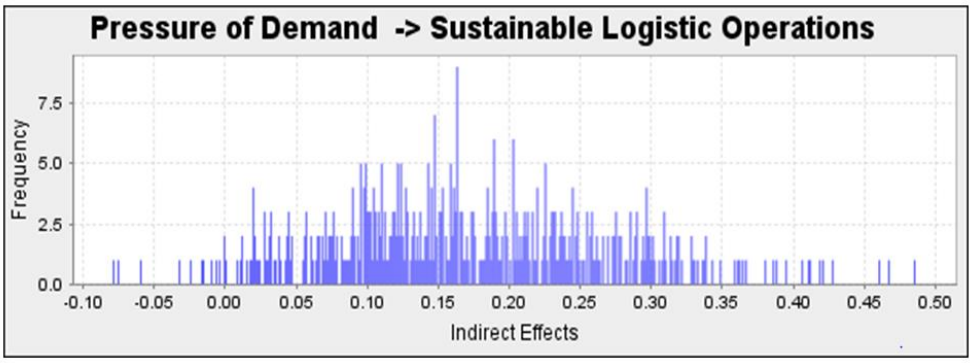

FIGURE 5
INDIRECT EFFECT HISTOGRAM: PRESSURE OF DEMAND -> SUPPLY CHAIN PROCESS -> SUSTAINABLE LOGISTIC OPERATIONS

CONCLUSION

This study examined the relationship between pressure of demand, inadequate management, market information and supply chain in sustainable logistic operations. Data were collected from the employees of logistic companies in Indonesia by using a questionnaire. Finally, data were analyzed by using PLS. In addition to this, the mediation effect of supply chain process was also examined in this study. Results of the study provided the important findings for the literature as well as practices. According to the results, pressure of demand, inadequate management and market information has vital role in supply chain process and sustainable logistic operations. It is revealed that pressure of demand and inadequate management has negative effect on sustainable logistic operations. Increase in the pressure of demand and inadequate management decreases the sustainable logistic operations. Pressure of demand has negative effect on supply chain. On the other hand, market information has positive effect on sustainable logistic operations. Increase in market information increases the sustainable logistic operations. Additionally, supply chain process has positive effect on sustainable logistic operations. Better supply chain has the ability to increase the sustainable logistic operations.

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