

The Impact of Lean Practices and Process Innovation on the Performance of Small and Medium Sized Enterprises: Mediating Role of Supply Chain management

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Abstract- The aim related to the present article is to investigate the impact of sustainability practices, lean practices and process innovation on the performance of SMEs in Indonesia. The aim also included the investigation of mediating role of supply chain management among the links of sustainability practices, lean practices, process innovation and performance of SMEs in Indonesia. The data of the study has been collected by using the questionnaires from the employees of SMES that related to the supply chain practices. The smart-PLS 3.0 has been employed for the purpose of the data analysis. The results revealed that lean practices and process innovation have positive association with performance of SMEs. The results also indicated that supply chain management positive along with significantly mediating among the links of sustainability practices, lean practices, process innovation and performance of SMEs in Indonesia. These findings are guided to the regulation making authorities that they should provide the focus on the supply chain and lean practices that enhance the performance of SMEs.

Keywords; *Sustainability practices, Lean practices, Process innovation, Supply chain management, Performance of SMEs*

1. Background

Numerous changes in environments usually countered as an eminent element that humanity faces. The focus of various studies have widely enumerated large companies rather than small ones; therefore, the study involves small and medium enterprises. The involvement of various practices is ascertained by employing various variables. The international corporations are usually unknown by the types of large companies; therefore, the context of small and medium enterprises significantly contributes toward the sustainable environments of all firms. Whether companies are judged by the sizes of investments in products and services, every company is eminent for the economy of every country [6]. Over time, small and medium enterprises have risen that induces eminent impact over the emerging economies of the world. The dominance of large companies tends as importance over the economies but the significance of SMEs are known as

important measures through which economies have gained much larger contribution rather than larger ones [30]. Government induces various measures that successfully contribute toward the firms of both sizes but the SMEs could attain better levels that are referred by the policies of governments. Various supporting measures that are rendered by the national governments includes policies and strategic recognitions; therefore, the significance could be enumerated in a sense of economic development [12]. It is eminent that SMEs widely contributed to the economies for the development of various measures to enable the sector of small and medium enterprise. It is consistent that, environments place various damaging measures over the SMEs; therefore, effective practices are required to be adapted to eliminate the prevailing scenarios [26].

Various barriers prevail in companies that are stacked into performance behaviors; therefore, various strategic implementations could easily enumerate the existing flaws and can help in eliminations. Some research and development measures are required in companies which could help companies to act robustly in competitive environments [21]. Although, companies require effective policies and R&D, the SMEs also in need of various advantages that could help in a robust way to improve the performance of SMEs in global markets. Some technological measures and financial needs are required by SMEs that could enhance the performance levels in global markets [33]. Due to variation in distribution towards economies of various countries, SMEs are countered as a major contributor; therefore, proper implementing measures as provided to various large sectors should be provided to SMEs to strengthen the behavioral effectiveness [27]. Where the various contributing factors are dominated in this study, the effects are inducing some eminence towards the performance of SMEs. Although, SMEs were performing significantly toward the economies of countries also influenced by the involvement of politics that is eminent in every country [36]. Various practices are adopted by

companies that are providing services and manufacturing for the reduction of wastes; therefore, lean practices are eminent in the performance of SMEs. The significance of lean practices and environments are significant where sustainable efforts require positive enumeration of various variables that could help in growing links [31]. The process of lean practices eminently elaborated by the process of manufacturing that involves various creative techniques. To improve efficient measures, the implementation of lean practices significantly help businesses to eliminate the practices that are countered as wastes to the business [17].

Moreover, lean practices also improve the efficiency of businesses through various measures where the impacts over the performance of SMEs are dominant. Variant ways of innovation are discussed for the company's improvement; therefore, lean practices are countered as some of them which efficiently enumerates the performance of firms [4]. Various process of innovations is performed in the company behaviors where the level of screening is an important element. Companies are generalizing the issues with various elements of mobilizing which are countered as eminent ideas that could significantly contribute toward the enhancement of organizational performance. Various sustainable environments are designed by companies to help to sustain in various channels of competitive environments [14]. The effective use of energy in the companies could help in cost-cutting from various aspects where the role of wind and solar energy are founded as dominant in the process of innovation and lean practices for the performance of firms [28]. Role of lean practices has dominated in the companies with the driving of new ideas and strategies that are helping companies to sustain in competitive environments. The role of supply chain management is positively contributing to companies within the effects and influences of various variables towards the performance [32]. Supply chain management significantly enumerates the role of practices of lean and process of innovation that are counted as significant for the enumerating of SMEs. Study endorsed various factors that help in improving the performance of firms where the importance of lean practices and process of innovation dominates while the significance of supply chain management is inserting a link between the performances of factors that affects the relationship. The linkage of elected factors of the study significantly elaborates the objectives which are helpful in the sustainability of SMEs.

2. Hypotheses development

Various authors suggested lean practices and innovation process eminent element which are required to be formed jointly. The lack of adapting practices of lean and innovation could disrupt the performance of firms whereas the effectiveness of firms is pertinent towards the proper

adaptation levels [5]. Different strategies of changing environments help companies to maintain the sustainable environment of businesses while lean and innovation are dominant for countering change in environments. Studies referred to the relationship between innovation and lean which is significant in literature and significantly endorses impacts on performance sustainability [7]. Moreover, studies on various innovation practices and performance toward the SMEs are positively enumerated by vast literature where the effects are lean practices are eminent about the sustainable performance. The oversights are critically inducing some eminent means which helps companies in various ways where the tradeoffs and synergy are countered as significant factors [10]. Studies elaborated various variables that put influence over the performance of firms; therefore, the existence of elected factors are also dominant in various studies inducing some impacts.

The role of sustainability practices widely dominated by studies referring to various measures that impact the performance of firms. There is an existence of corporate responsibility by the companies to maintain a sustainable environment in competitive markets [13]. Although, environment dominates to be an important element that helps companies in attaining performance levels the significance of working environment contributes toward the company's growth. It is dependent on the firms to establish eminent measures for the communal elements which usually disrupts the performance of organizations [35]. Role of various incidents in the organizations and competitive world widely influences the performance of an organization; therefore, effective strategic measures are required for the positive performance of companies. The exceptional measures taken by companies for maintaining the sustainable environment contributes effective measures toward organizational performance [1]. Although many strategic implications endorse eminent impact over the performance the effective use of sustainability practices could be dominant for elaborating the performance of firms.

H1: Sustainability practices significantly influence the performance of SMEs.

Past literature mentioned the practice of lean over the reduction of waste and efficiency of resources which are countered as eminent resources for the betterment of performance through reducing costs in companies. When the costs of various practices are higher there are impacts over the performance of organizations [8]. The use of effective lean practices could not only enhance the social performance of an organization but also help companies to lower the cost that prevails in higher expenses. Companies that adopt strategies for achieving the efficiency of energy usually are concerned in literature with a variety of influences; therefore, the use of lean practices could help

in achievements for many organizations [25]. Most of the studies mentioned lean practices dominant element that helps companies to attain the level of performance from the competitive environments. The overall performance of an organization is not only helpful for the business terms but also help employees to achieve better benefits which are pertinent to the higher performance levels [3].

H2: Lean practices significant impacts on the performance of SMEs.

Innovation dominates in companies by providing a variety of benefits to the firms at various levels. The innovation process involves various stages in companies to attain better performance out of the competitive environment [37]. The use of better policies by employing innovation process where help companies to attain higher performance also help customer to attain goods at lower costs with all satisfying measures. Therefore, using the effectiveness of the process of innovation companies are enumerated by literature easily to enhance the growth of companies [2]. Prior studies enumerated the role of an innovation process which positively contributes toward the companies while the measures of innovation process include various dimensions which positively influences the performance of organizations. The targets that are assigned by companies could be easily retrieved by the employment of innovation process whether the targets are socially and environmentally linked [16]. Perceptions of managers are based on the level of strategic measures that companies usually induce to follow, while the desires belong to the performance of companies as stated in the literature.

H3: Process innovation positively influences the performance of SMEs.

The supply chain is integrated with various factors, while sustainable practices are positively linked with the performance of organizations. Although, there is a significant relationship between supply chain management and the linkage of performance with sustainability the effectiveness of supply chain management positively enumerated the role among them [9]. The merger point of supply chain management positively enumerated the endorsement of sustainable practices among the achievement of organizational performance [11]. For achieving sustainable practices, the role of supply chain management efficiently inserts a vital role in the dominance of elements that exist in wide studies [29]. Through various means, supply chain management inserts a dominant role among the organizations where the mediating role of supply chain management among various factors are also enumerated in studies [28]. The study mentioned the role of sustainable practices for the achievement or elaboration of impacts over the performance of small and medium enterprises; therefore, supply chain management significantly inserts vital role among them for the achievement of various targets.

H4: Supply chain management significantly and positively mediates between sustainability practices and performance of SMEs.

Lean practices have been dominantly enumerated in the literature influencing the performance of firms whether of large or small. Supply chain management is enumerated by a variety of studies inserting variant roles among the elected variables, while this study involves lean practices which are measured as a tool for sustainable performance [10]. Therefore, supply chain management contributes eminent measures to describe the role of lean practices and performance of firms. Lean practices usually employ various measures for achieving better performances; therefore, supply chain significantly helps lean practices to be implemented upon the performance levels of organizations [34]. Using effective measures of supply chain management could help organizations to achieve better advantage positions in the market where the behaviors are complex in the attainment of various task. Studies enumerated supply chain management employing various measures along with the implication of strategies but the eminence of supply chain management among the lean practices significantly enumerated a better level of performance in markets [22].

H5: Supply chain management significantly and positively mediates between lean practices and performance of SMEs.

When companies are conscious about the benefits they also think about the rising level of expenses; therefore, effective strategies are adopted by process of innovation which is supported by the supply chain management [18]. The mediating role of supply chain management widely discussed literature of various natures about the companies endorsing enormous impacts over the performance of organizations [24]. The levels of administrations are performed by the process of innovation to maintain the sustainable environment while supply chain management help to insert role positively among the performance of the organization as well as the innovation process [19]. Various processes are defined in literature with vast impacts on the performance of an organization where the role of supply chain management is also dominant. Therefore, the role of supply chain management help to add the values between the context of one side and the other sides effectively as enumerated by wide literature [33].

H6: Supply chain management significantly and positively mediates between process innovation and performance of SMEs.

3. Methodology

The aim related to the present article is to investigate the impact of sustainability practices, lean practices and process innovation on the performance of SMEs in Indonesia. The aim also included the investigation of the

mediating role of supply chain management among the links of sustainability practices, lean practices, process innovation and performance of SMEs in Indonesia. The data of the study has been collected by using the questionnaires from the employees of SMEs that related to the supply chain practices. The individual is the respondents while simple random sampling has been adopted to collect the data. Approximately 510 questionnaires have been distributed among respondents but only 370 returned and used for analysis that has 72.55 per cent response rate. The smart-PLS 3.0 has been employed for the data analysis due to the complexity of the framework. The variables used to consist of one mediator such as supply chain management (SCM) that has five items, one predictive variable such as performance SMEs (PSME) that also has five items [20]. In addition, the present study has adopted three predictors such as sustainability practices (SP) that has four items, lean practices (LP) that has eight items and process innovation (PI) that has six items [6]. These variables are shown in Figure 1.

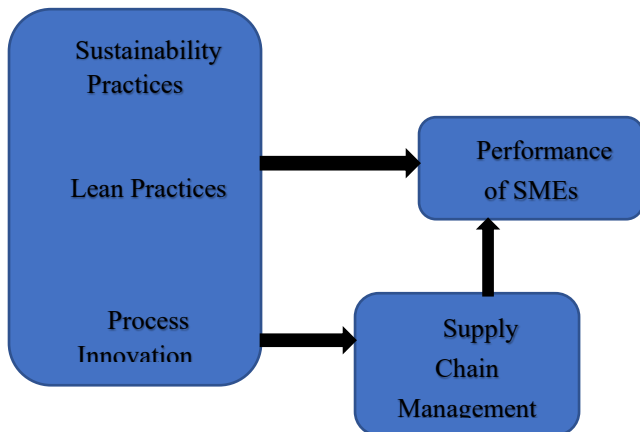


Figure 1. Research model

4. Results

The results revealed the valid convergent validity and high linkage among the items because the values of loading along with AVE are more than 0.50 while the values of Alpha along with CR are larger than 0.70. These values are mentioned in Table 1.

Table 1. Convergent validity

Items	Loadings	Alpha	CR	AVE
LP1	0.755	0.880	0.905	0.544
LP2	0.706			
LP3	0.659			
LP4	0.678			
LP5	0.735			

LP6	0.730			
LP7	0.813			
LP8	0.810			
PI1	0.747	0.860	0.894	0.586
PI2	0.743			
PI3	0.747			
PI4	0.755			
PI5	0.763			
PI6	0.832			
PSEM1	0.738	0.798	0.868	0.623
PSEM2	0.750			
PSEM4	0.839			
PSEM5	0.825			
SCM1	0.850	0.849	0.892	0.623
SCM2	0.828			
SCM3	0.766			
SCM4	0.718			
SCM5	0.779			
SP1	0.650	0.746	0.811	0.591
SP3	0.848			
SP4	0.794			

The results also revealed the valid discriminant validity and no high linkage among the variables because the values of Fornell Larcker and cross-loading show that link with current variable itself is more than the link with other variables. These values are mentioned in Table 2 and Table 3.

Table 2. Fornell Larcker

	LP	PI	PSEM	SCM	SP
LP	0.738				
PI	0.561	0.765			
PSEM	0.624	0.651	0.789		
SCM	0.553	0.659	0.654	0.789	
SP	0.152	0.214	0.250	0.310	0.769

Table 3. Cross-loadings

	LP	PI	PSEM	SCM	SP
LP1	0.755	0.397	0.556	0.461	0.163
LP2	0.706	0.406	0.376	0.298	0.028
LP3	0.659	0.333	0.395	0.297	0.003
LP4	0.678	0.395	0.410	0.389	0.001
LP5	0.735	0.505	0.446	0.435	0.150
LP6	0.730	0.464	0.496	0.396	0.094
LP7	0.813	0.395	0.459	0.441	0.190
LP8	0.810	0.413	0.502	0.490	0.202
PI1	0.526	0.747	0.470	0.433	0.125
PI2	0.406	0.743	0.625	0.709	0.263
PI3	0.349	0.747	0.405	0.379	0.123

PI4	0.360	0.755	0.459	0.480	0.125
PI5	0.440	0.763	0.434	0.440	0.164
PI6	0.491	0.832	0.518	0.471	0.132
PSEM1	0.437	0.511	0.738	0.524	0.191
PSEM2	0.450	0.455	0.750	0.427	0.164
PSEM4	0.547	0.553	0.839	0.554	0.213
PSEM5	0.525	0.530	0.825	0.547	0.215
SCM1	0.475	0.604	0.579	0.850	0.244
SCM2	0.444	0.529	0.518	0.828	0.243
SCM3	0.374	0.434	0.406	0.766	0.299
SCM4	0.423	0.427	0.452	0.718	0.201
SCM5	0.456	0.576	0.591	0.779	0.243
SP1	0.181	0.129	0.220	0.196	0.650
SP3	0.043	0.206	0.206	0.277	0.848
SP4	0.142	0.150	0.143	0.233	0.794

The results also revealed the valid discriminant validity and no high linkage among the variables because the values of Heterotrait Monotrait (HTMT) ratio are less than 0.90. These values are mentioned in Table 4.

Table 4. Heterotrait Monotrait ratio

	LP	PI	PSEM	SCM	SP
LP					
PI	0.643				
PSEM	0.733	0.762			
SCM	0.626	0.731	0.780		
SP	0.251	0.269	0.344	0.419	

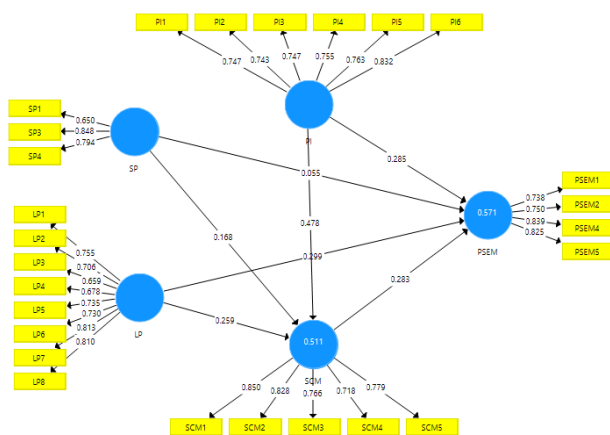


Figure 2. Measurement model assessment

The path analysis revealed that sustainability practices has insignificant linked with SMEs performance and reject H1. However, lean practices along with process innovation are positively linked with SMEs performance and accept H2 and H3. In addition supply chain positive and significantly mediating among the links of sustainability practices, lean practices, process innovation and SMEs performance and accept H4, H5 and H6. These links are shown in Table 5.

Table 5. Path analysis

Relationships	Beta	S.D.	t-statistics	p-values
LP -> PSEM	0.299	0.047	6.385	0.000
LP -> SCM	0.259	0.050	5.199	0.000
PI -> PSEM	0.285	0.052	5.475	0.000
PI -> SCM	0.478	0.048	10.061	0.000
SCM -> PSEM	0.283	0.050	5.637	0.000
SP -> PSEM	0.055	0.033	1.652	0.102
SP -> SCM	0.168	0.042	4.010	0.000
LP -> SCM -> PSEM	0.073	0.017	4.233	0.000
PI -> SCM -> PSEM	0.136	0.032	4.233	0.000
SP -> SCM -> PSEM	0.048	0.014	3.416	0.001

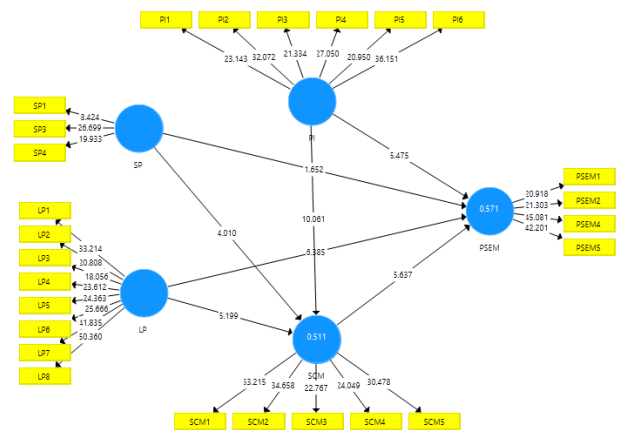


Figure 3. Structural model assessment

5. Discussion and conclusion

The results revealed that lean practices and process innovation have a positive association with performance of SMEs. These findings are similar to the output of Möldner, Garza-Reyes [23] who investigated that the SMEs performance dependent on the lean practices and process innovation of the firm. In addition, these findings are also the same as the outcomes of the Khalil, Khalil [15] who investigated that lean practise has a positive association with performance of SMEs. The results also indicated that supply chain management positive along with significantly mediating among the links of sustainability practices, lean practices, process innovation and performance of SMEs in Indonesia. These findings are matched with the results of Dey, Malesios [6] exposed that the innovation performance along with supply chain positively related to the SMEs performance. These findings are guided to the regulation-making authorities that they should provide the focus on the supply chain and lean practices that enhance the performance of SMEs. Thus, the current study has concluded that the SMEs of Indonesia has effective lean practices along with strong process innovation and effective supply chain practices that enhance the performance of SMEs in the country. This study suggested that future study should focus on the

moderating role that is ignored by the present study. In addition, the future study should also expand their scope by adding more industries other than SEMs.

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