

Establishing Relationship between Barriers and Facilitators of Supply Chain Integration: A Supply Chain Governance Model

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Abstract- This research analyzes the influence of facilitators and barriers to the integration of supply chain on its performance. Moreover, it evaluates the relation among the facilitators and barriers of supply chain integration. The purpose behind the supply chain integration is to obtain efficiency in operational activities and effective strategic development through coordination in the supply chain. In order to achieve maximum efficiency, there is need for coordination and commitment among the partners in Supply chain to work mutually. There is need to recognize the external interdependencies when organizations work on protecting their self-interests internally. The study has used the focus of the research is on the internal and External governance efforts through the study of literature review. After conducting literature survey, research model is developed, and methodology is done. The results of the study related to the influence of facilitators and barriers on performance of supply chain are presented after research framework. The research will contribute to the literature by offering an understanding of the need for creating balance among the facilitators and barriers of integration in Indonesia.

Keywords: Supply Chain, Governance, Indonesia,

1.0.Introduction

The current dynamic business environment has necessitated for businesses to undergo Dance of Change in order to achieve competitive advantage. According to [1], it is required to develop a suitable governance system, which is a challenge for creating a balance between self-interest of decision makers and their interdependency across the supply chain. There must be balance between the interdependency and self-interest across the supply chain, which is the main concept behind the supply chain management. This philosophy of balance

creation is represented by the challenge of governance in order to make improvements in the performance of supply chain. As studied in literature, there is positive association between supply chain management and organizational performance. However, not every organization has implemented an effective governance system for the promotion of supply chain and its integration [2], According to [3], much of the research studies have studied the concepts of supply chain management rather than the limitations hindering the organization from effective supply chain integration. There is less research conducted on barriers to the management of supply chain and the development of related theory [3]. It is important to identify the hindrances to the management of supply chain along with the ways to overcome these barriers. According to the research study conducted by[4], there is need for analyzing the sources of supply chain barriers and ways to overcome these. This research is based on analyzing the barriers and supporting factors to supply chain management and its integration to understand the influence on the governance structures of supply chain.

This research analyzes the influence of facilitators and barriers to the integration of supply chain on its performance. Moreover, it evaluates the relation among the facilitators and barriers of supply chain integration. The purpose behind the supply chain integration is to obtain efficiency in operational activities and effective strategic development through coordination in the supply chain. In order to achieve maximum efficiency, there is need for coordination and commitment among the partners in supply chain to work mutually [5]. There is need to recognize the external interdependencies when organizations work on protecting their self-interests internally.

The focus of the research is on the internal and external governance efforts through the study of literature review. After conducting literature survey, research model is developed and methodology is done. The results of the study related to the influence of facilitators and barriers on performance of supply chain are presented after research framework. The research will contribute to the literature by offering an understanding of the need for creating balance among the facilitators and barriers of integration [6]. This is done to enhance governance strategies for improving supply chain integration. The potential of Supply Chain Management' theory has been highlighted by this research. There is lack of research on the barriers and facilitators to supply chain integration and therefore qualitative research method has been adopted in this study. In-depth interviews have been conducted to take a deep insight of the management aspects of integration of supply chain. In the quantitative survey, these interviews provide a base for empirical scales and their testing. In the context of supply chain, issues of integration are very complicated [7]. The complexity of issues is because of the integration of inter-organizational management in an effective manner. It is crucial to study the facilitators and barriers from the aspects of qualitative and quantitative for clear view related to their interactions and impact on performance. The use of previous studies has been made and extended to governance approaches and supply chain integration.

2.0. Literature Review

The flow of supply chain activities with the movement of raw inputs and goods to the respective customers is regarded as supply chain management (SCM) [8]. Supply Chain Management is regarded as the processes, which involve the flow of raw material to the end user for the provision of information, products and services that add value to the process[9]. Moreover, the objective of a firm to achieve strategic and operational efficacy by increasing coordination among the internal activities and relation with other firms is Integration [10].Supply chain becomes a network with several relationships for delivering value to the end customers through governance of integration. For this, the processes must be effective and efficient in product development and delivering them to the markets[11].

2.1.1. Governance Redesign

The interplay among the activities or processes for the purpose of change that result in growth is referred as governance redesign [12]. A balance is established between the limiting and facilitating forces in social [13]. According to Lewin (1951), the forces resulting in inclination of an individual or group are the driving forces while those restricting the inclination are the opposing forces. According to the model presented by [13], change occurs in three steps. The first step is of unfreezing, second is to move to the new process and then freezing the process. The change is for limited time without the refreezing process. This limited time change is referred as shot in the arm by [13]. The change occurs and after some time, it moves back to the previous state.

In order to make the change permanent, the process of refreezing is required. The new change should be resisted from any further change immediately. Such governance change requires time and perseverance and is related to building of capacity [14]. Individuals strongly resist change if it deviates from values of group as change in governance is linked with the changing norms and social aspects of organizations [13]. When there comes changes in-group values, individuals are expected to change for incorporating the new group values [13].According to[14], three processes have been identified, which are related to each other. These processes include development of new learning capabilities, informal networks and implementing new business practices. The results of the new practices should increase the change credibility. Both the inputs such as social norms and capabilities and outputs including improvement and performance must be changed for supporting governance redesigning permanently. The process of supply chain integration is slow. It needs new capabilities such as improved skills and knowledge as well as information technology. Moreover, new social norms must be developed. It is less likely to keep the motivation towards the change path without reflecting positive results.

There are three foundations of permanent change. These include social norms, improvements in performance and capabilities. The integration of cross-functional business processes in an organization is involved in supply chain, which makes it challenging. The process involves the integrating processes among the supply chain partners [15], Internal and across the organizations interaction across the supply chain is involved in

Supply Chain Management. All the types of integration have been explained as below:

2.1.2. Internal Integration

The process of integration within the organizational limitations or boundaries is referred as internal integration [16]. The purpose behind internal integration is to establish a process-oriented framework, which has its focus on achieving efficiency in the functional areas of the organization. This will make the overall process to be effective. The key emphasis is on bringing coordination across the operational areas, which can be analyzed through the level of interaction among the logistics with other areas of functioning [17]. The process of integration shows the way in which different organizational departments work in a coordinated way [18].

A positive relation exists between the organizational performance and internal integration. According to [19], there is positive relation between integration within the logistics and marketing activities and performance of a firm. Internal collaboration creates a positive influence of logistics performance [1]. Moreover, it is found by [20], that internal integration predicts the logistics performance. The overall performance of the organization and improvements in it are linked with the internal integration. A positive and direct relation exists among the internal collaboration and performance of a firm [19].

2.1.3. External Integration

The process of integration that exists among the partners of supply chain is regarded as external integration [16]. Backward integration with suppliers and forward integration with the customers is involved in external integration [2]. The focus of external integration is on making efforts for collaboration and coordination among the members of supply chain [21]. It has become a suitable strategy to build external collaborations for surviving in this changing global environment [22]. The development of external collaborations increases the capability of a firm through use of supporting skills, resource pooling and information sharing.

It has been shown by the previous research studies that performance is positively influenced by the external integration. According to [23], the performance is positively affected by the external integration. The overall performance of an

organization is influenced by customer integration, which is a critical competency factor [5].

The logistics performance is positively influenced by external collaboration [6]. The performance can be long term if there is formalized collaboration [24]. Moreover, it was found by [25], that there could be increase in financial performance of an organization through collaboration among the suppliers. Strategic supplier partnership.

2.2. Barriers to Integration

To manage the facilitators and barriers is involved in the governance of integration for internal as well as external integration. There are certain challenges linked with the internal and external integration but there is need for analyzing the barriers that occur in the way of integration or make it difficult to implement successfully.

There are few research studies existing on the determination of governance barriers in supply chain. It is required to develop a new way of approaching towards sustainable practices in order to do internal integration. However, it is not easy to develop new policies and practices [26]. Changes are required in the structure of an organization and its incentive system for internal integration. Without making changes, internal integration cannot be done easily [27]. Peter Drucker has termed this difficulty of internal integration as Great Operating Divide. Bowersox [28], also used this term for defining the unavailability of cross-functional integration in the main functioning areas of an organization. These areas include sourcing of material, production, marketing and management of logistics.

In order to understanding the ways for improving internal integration by organizations, [29], analyzed the determinants behind the internal collaborative behavior. According to [29], there are five aspects of inhibitors for collaborative behavior. These five dimensions include the lack of sufficient knowledge, lack of communication, poor relationships at work, lack of direction and guidance from the management and conflicting goals. In literature, [30], discovered two barriers for organizational integration. These two barriers are political and specialization. From different aspects related to frame of reference and goals, specialization can be a barrier. Struggle for power may arise and conflicts can be created by these barriers [30]. It has been indicated by the study of inter-organizational governance that there are well stated and legendary problems in the non-integrated

supply chains in contrast to integrated ones [31] and [32].

Almost 60% of the companies interviewed were having issues in managing supply chain for internal integration [2]. The focus of these firms was on the internal integration. It was not observed that any of these firms has end-to-end integrated supply chain. This was because of the failure of firm's ability to monitor and strategically work. Several initiatives such as Continuous Planning, Replenishment, Forecasting and Efficient Consumer Response motivate for working on external integration but there has been less improvements in this regard [33],[34]. The barriers in successful management of supply chain include failure of understanding, lack of trust, loss fear, poorly structured goals, lack of effective management system [35]. Other barriers include complex nature of supply chain issues, short-term objectives rather than the focus to be on long-term performance. According to [36], there are different barriers for making efforts towards collaborative planning such as lack of visibility, sharing of information and functional silos. These barriers can exist at every level from strategic to tactical and operation.

The previous research studies have indicated a positive influence on the performance through efforts for internal and external integration. However, there is lack of research on the emergence of barriers in the integration along with its impact on supply chain performance. The supply chain integration channeled through internet is influenced negatively by the internal and external integration barriers [37], when the focus of an organization is on the maximization of individual performance; the negative performance is expected to be the result. The focus must be on improvement in the overall performance of supply chain. This would result in optimal performance.

The perception of the management is altered through internal focus regarding the environment and development relationship among the supply chain partners [32] a centralized focus is reflected when an organizations implements an information system, which has been developed independently. This results in redundant information and processes. The consistency of information is disrupted by this behavior based on self-interest and it results in loss of effective decision-making and communication among the supply chain partners [13]. It has been hypothesized the overall performance of supply chain is reduced because of the barriers to the integration.

H1: Supply chain performance is negatively influenced by the barriers to governance of supply chain integration.

2.3. Facilitators of Supply Chain Integration

After understanding the barriers to the integration of supply chain, there is need for analyzing the facilitators or factors supporting the integration process. According to [38], existence of strong relationships at work, increased level of communication, involvement of senior management, accountability and coordination of marketing and logistic activities are factors that support the process of integration. Different facilitators have been identified by [36], which include the establishment of mutual goals, sharing of information and interdependency. The identified enablers are likely to strengthen the relationships of firms and effective governance. The barriers existing in the process of supply chain integration can be overcome in different ways presented by [35]. These include the improvements in information sharing and communication, development of teams across organizations and setting new measures for performance. The term 'united front' has been used by [39], to show that a level of commitment can be established through formation of alliances, which cannot be controlled by the traditional structures of organization. The establishment of such relationships can give authority to the managers of individual organizations to become changing factors for across organizations [40].

When the process of integration is done in a proper way, this could result in improved life cycle time, low transportation cost, low level of inventories, collaborative planning, and high level of customer satisfaction. All these are the positive outcomes associated with a rational integration supply chain [41]. For understanding and establishing performance measures, communication provided foundation. Effective communication within and across organizations can lead to the establishment of strong relations with the supply chain partners. Supply chain partners can establish standards, which mitigate result in improved performance and effective decision making [42]. It has been hypothesized that the supply chain performance is improved by the facilitators of supply chain integration.

H2: The Supply Chain Performance is positively influenced by the facilitators to the governance of supply chain integration.

The relation between the facilitators and barriers has not been studied by any research previously. Previous research studies have worked on the study of these factors and supply chain integration. There is need to understand the association among these factors for providing the organizational management a way forward towards successful implementation of supply chain integration process. For this reason, it is crucial to understand the relation among these factor, irrespective of the focus on efforts for internal and external integration. The performance of a firm is influenced through the internal and external integration. Therefore, any effort for implementing governance structure is leading to the performance improvement.

It is difficult to overcome the barriers in the process of integration. There are various challenges linked with bringing change in the organizations. When there are equal number of factors forcing and opposing change, this leads to change resistance and it sets in the organizational inertia. According to [43], the organization comes in the state of equilibrium. To overcome the barriers, [9], has discussed some additional force that is required. According to him, the original organizational structure should be broken and a new change should be refrozen for long term. Some external disturbance becomes the additional force, which can be loss of market share or competitive advantage. Such forces can support in the process of unfreezing the organization and leading the change to take place [43]. The organization comes back to the original state when it is refreezing by the organizational inertia. It has been hypothesized in the research that the facilitators of integration are negatively influenced by the barriers to integration. The conceptual model linked with the hypothesis has been shown in Figure 1.

H3: Facilitators of supply chain integration are negatively influenced by the barriers to the governance of supply chain integration.

2.4. Theoretical Framework:

The current study is carried out to examine the relationship between supply chain management

practices, competitive advantage and organizational performance. Basing on the resource-based theory the following hypothesis are drawn to achieve the objective of the current study.

3.0. Methodology

For achieving the set objectives, this research has used quantitative research methods supported with a questionnaire. The data collection has been done from managers of different firms operating in Indonesian manufacturing sector. The managers were from the fields of production, and operations. Questionnaire survey was conducted among 650 respondents, but the complete questionnaires were about 435, which shows the response rate to be 67 percent. The present study has targeted two main categories of manufactures, firstly foreign manufacturing suppliers and exporting manufacturers of products in Indonesia, and secondly heavy polluters or manufacturers who are responsible for greater environmental pollution. In the initial process of data collection, convenience sampling was employed in order to deal with any misunderstandings regarding survey questions or in case of facing difficulty in data collection. Responses were collected from the respondents, after detailed explanation of questionnaire items through workshops and site visits

4.0. Research Analysis and Discussion

This research study has used of PLS-SEM research method. This is a two-step technique [38]. Before the formation of inner model or structural mode, the outer model is estimated. Individual testing is done for each construct within the mode. To ensure the validity and uni-dimension of research, the outer model is estimated. The similar process is carried for the higher order construct domain.

The process of modification is done in relation to the research theory to adjust the indicators, which are not related to the construct. Each step is done according to the principle component analysis (PCA). The PLS-SEM approach can explain the complexity of the model without the limitation of sample size. There is no requirement of normal distribution in this approach. The focus of the approach is on non-parametric technique. The approach has the capacity to deal with the reflective as well as formative measures [31]. It has been used by a number of researchers in their research studies for the determination of technology factors

in supply chain and their influence of the supply chain performance.

The relationship of variables to the construct is reflected through loading. The value of loadings to be above 0.50 is considered acceptable [30]. However, the square of this value should be equal to the variance of the variable or construct. About 50% of the variance is explained by the construct and variance error measurement to be 50 and above is applicable. The values within the range of 0.50-0.60 are considered acceptable for the first studies. In the similar way, the value to be greater or equal to 0.50 was used for this research study.

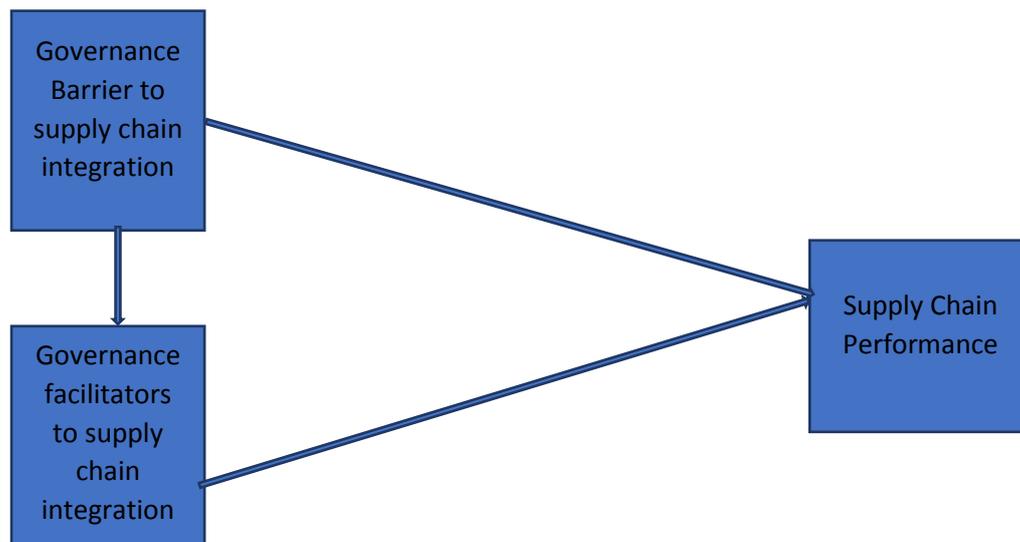


Figure 1: Conceptual Framework

Cronbach's Alpha has been used for measuring the internal consistency of model. The value of Cronbach alpha to be 0.7 or above is considered appropriate [40]. For the current research, there is need for more credence to the composite reliability estimation. Low error variance is resulted by high reliability [43]. [Moreover, the construct validity is referred by the composite reliability. The difference of indicators of latent variable from each other is estimated through discriminant validity based on the indicators. There should be low level of association (correlation) among the constructs compared with the reliability estimates. Factor loadings were above 0.5, while the value for composite reliability turned out to be higher than 0.7.

Therefore, present study achieved the level of convergent validity. Content validity measure is referred as the degree to which the measurement of the manufactured products is adequately assessed and measured. However, all the developed items for measuring the latent variables must have greater factor loadings as compared to rest of the constructs, that can be ascertained through extensive investigation of the literature review. Reviewing literature will result in selection of factors based on their validity, in the available literature. Based on the outcomes of factor analysis, it confirms that all items are loaded accurately to their respective variables. Convergent validity is examined using reliability analysis, composite reliability, and factor loadings. Moreover, average variance extracted (AVE) is also used in understanding validity. Convergent validity depicts

that within parent factor, variables either dependent or mediating, can correlate with each other.

Table 1: CFA

	CR	AVE
GBSCI	0.915	0.812
GFSCI	0.895	0.772
SCP	0.932	0.617

The discriminant validity is measured in the assessment of inner model, which is the next step. The extent of the difference in the measurement of constructs from each other is the discriminant validity. After examining the cross-loading items with loading items, the discriminant validity is determined in this research. The comparison of loading and cross-loadings has been represented in Table 1. It has been suggested by the path-modeling experts that cross-loadings should be lesser than the loading items. Items with cross loadings. This has been presented in Table 1. Scholars of path modeling have suggested that cross loadings should be less than all the items loadings [3].

Table 2. Discriminant Validity

	1	2	3
GBSCI	0.948		
GFSCI	0.731	0.798	
SCP	0.518	0.550	0.801

In the next part, the structural model is developed and estimated after the measurement of validity and reliability. Therefore, for this step, SEM has been used to test the hypothesis. In this step, the direct and indirect impact has been evaluated. The evaluation of indirect effect has been done for the mediation purpose. The p-value has been considered. For hypothesis testing, the minimum

level of $-p$ -value was considered to be at 0.05. The structural model has been assessed after the measurement model in this study. A sample of 500 bootstraps and 249 cases has been used in the process of standard bootstrapping for this study. The significant of path coefficient is determined. Following the guidelines of previous research studies, this process has been carried out. It has been revealed through direct results that all the hypotheses have p-value less than 0.05.

Table 3. Direct Effect

	(β)	SD	T-value	P-Values
H1	0.111	0.035	3.161	0.002
H2	0.207	0.043	4.810	0.000
H3	0.321	0.051	3.161	0.000

Other than the evaluation of predictive criterion of accuracy, the predictive relevancy of Q2 has been identified. For analyzing the R-squared value, the effective size of q2 has been calculated after the Q2 values. The present study has determined the goodness of fit for the approach used as done by the previous research studies. In the next section, the relevant statistics have been discussed briefly. The results of PLS have been interpreted. It has been suggested by the experts of path modeling that cross-loadings must be lesser than the loadings of all factors. For the evaluation of R-squared value, the effect size has been determined.

Table 4. Expected Variance

	R ²
SCP	44.1%

The results of the current study have shown a great deal of agreement with the hypothesized results.

5.0. Conclusion

This research analyzes the influence of facilitators and barriers to the integration of supply chain on its performance. Moreover, it evaluates the relation among the facilitators and barriers of supply chain integration. The purpose behind the supply chain integration is to obtain efficiency in operational

activities and effective strategic development through coordination in the supply chain. In order to achieve maximum efficiency, there is need for coordination and commitment among the partners in supply chain to work mutually. There is need to recognize the external interdependencies when organizations work on protecting their self-interests internally. The focus of the research is on the internal and external governance efforts through the study of literature review. After conducting literature survey, research model is developed, and methodology is done. The results of the study related to the influence of facilitators and barriers on performance of supply chain are presented after research framework. The research will contribute to the literature by offering an understanding of the need for creating balance among the facilitators and barriers of integration. This is done to enhance governance strategies for improving supply chain integration. The potential of Supply Chain Management' theory has been highlighted by this research. There is lack of research on the barriers and facilitators to supply chain integration and therefore qualitative research method has been adopted in this study. In-depth interviews have been conducted to take a deep insight of the management aspects of integration of supply chain. In the quantitative survey, these interviews provide a base for empirical scales and their testing. In the context of supply chain, issues of integration are very complicated. The complexity of issues is because of the integration of inter-organizational management in an effective manner. It is crucial to study the facilitators and barriers from the aspects of qualitative and quantitative for clear view related to their interactions and impact on performance. The use of previous studies has been made and extended to governance.

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