

IMPACT OF LEGAL FRAMEWORK AND SCM POLICIES ON SUPPLY CHAIN COLLABORATION: ROLE OF INFORMATION TECHNOLOGY

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Abstract: *The purpose of this study is to investigate the Legal Framework and SCM policies governing supply chain collaboration, as well as the function of Information Technology as a mediator. The collection of direct data from respondents is a fundamental component of research methodology. Using a self-administered questionnaire from prior research and a Google form, the initial data was collected. data collected. Pakistani respondents from Sindh manufacturing firms. We have employed convenience sampling and cross-sectional methodology due to a variety of constraints, including time, location, and financial constraints. The effect of the legal framework on supply chain collaboration in manufacturing firms in Sindh, Pakistan. The findings demonstrated that direct effect have a significant and positive beta. The full mediation effect of information technology as a mediator between legal framework planning and supply chain collaboration in Sindh, Pakistan, manufacturing firms is demonstrated. In addition, the effect of SCM policies on supply chain collaboration in manufacturing firms in Sindh, Pakistan. The findings revealed that beta values for the direct effect are positive and significant. The full effect of information technology as a mediator between SCM policies and supply chain collaboration in manufacturing firms in Sindh, Pakistan, is demonstrated. The findings of this study highlight the importance of a supportive legal framework and efficient supply chain management policies to facilitate supply chain collaboration. In addition, it highlights the essential role that information technology plays in facilitating and enhancing supply chain partner collaboration.*

Keywords: *Legal Framework; SCM policies; Supply chain collaboration; Information Technology*

INTRODUCTION

The objective of supply chain management is to optimize the flow of services and commodities, begins with the procurement of raw materials and ending with the delivery of finalized products to consumers (Zutsara, 2021). It entails coordinating and incorporating diverse activities such as sourcing, procurement, production, logistics, and distribution to ensure that products are delivered efficiently, on time, and at the appropriate cost. Effective collaboration can enhance communication between supply chain participants, thereby decreasing delays and misunderstandings (Jiang, 2019). This can result in quicker decision-making and enhanced activity coordination. Collaboration can result in an improved integration of processes, systems, and technologies, which increases efficiency and productivity. Collaboration can aid in identifying and eliminating supply chain inefficiencies, resulting in cost savings. Collaborating to guarantee product quality may boost customer satisfaction. Collaboration may make sharing information and ideas simpler, leading to innovation and ongoing improvement (Fischer et al., 2020; Sader et al., 2019). Collaboration may decrease supply chain risks and delays. Effective supply-chain collaboration may boost a company's communication, effectiveness, cost savings, quality, innovation, and risk management (Nayal et al., 2022).

Cooperation in the supply chain involves working together to accomplish common goals (Ahmed et al., 2020). To enhance supply chain data, commodities, and services, suppliers, manufacturers,



distributors, and consumers must form partnerships. Sharing information, resources, and knowledge across the supply chain improves efficiency, lowers costs, and boosts customer satisfaction (Siagian et al., 2021). It may entail shared risks, rewards, and planning. Supply chain collaboration involves trust, transparency, and cooperation. It may boost productivity, quality, innovation, cost, and customer pleasure. Supply chain management solutions promote visibility and cooperation. In poor countries like Pakistan, the government may promote supply chain cooperation (Ilyas et al., 2020). The government can develop policies and regulations that encourage supply chain stakeholders to collaborate, such as tax incentives for joint ventures and public-private partnerships. The government can ensure that legal measures are in place to secure supply chain partners' intellectual property and other assets (Agrawal et al., 2021). By developing supportive policies, providing infrastructure, facilitating information sharing, promoting capacity building, ensuring legal protections, and encouraging international trade, the government can play a crucial role in promoting and facilitating supply chain collaboration in emerging economies such as Pakistan (Kshetri 2021; Hanif et al., 2020).

There is an increasing body of literature on the impact of legal frameworks and supply chain management (SCM) policies on supply chain collaboration, especially in the context of developing nations like Pakistan (Men et al., 2023; Shaikh et al., 2022; Chen et al., 2022). Nonetheless, there is a lack of research on the function of information technology in this regard, particularly in the manufacturing industry. Possible research question: "How do legal frameworks, SCM policies, and information technology impact supply chain collaboration in manufacturing companies in Pakistan?" The research can concentrate on determining the extent to which legal frameworks and SCM policies enable or hinder collaboration among supply chain partners in Pakistan's manufacturing sector. In addition, the study may examine the role of information technology in facilitating collaboration, such as the use of supply chain management systems and other digital platforms. The study may also investigate case studies of manufacturing firms in Pakistan that have successfully implemented supply chain collaboration initiatives, as well as the role that legal frameworks, SCM policies, and information technology played in the success of these initiatives.

Hypothesis Development arguments

Legal Framework

Legal structures can have a substantial effect on supply chain collaboration. The legal environment in which supply chains operate can affect the behavior of supply chain partners and the extent of their collaboration (Shin et al., 2019). Strong legal protections for intellectual property can facilitate collaboration among supply chain partners by assuring the security of confidential information and technology. The effects of competition law on supply chain collaboration can be both positive and negative (Chi et al., 2020). It can prevent anticompetitive behavior that could be harmful to collaboration, but it can also discourage collaboration that could be advantageous for supply chain efficiency and innovation. By regulating employees' and employers' rights and responsibilities, labor laws can affect supply chain collaboration (Govindan et al., 2021). Ensuring that labor practices are ethical and sustainable, fair labor laws can encourage collaboration among supply chain participants by promoting ethical and sustainable labor practices. Environmental regulations can influence supply chain collaboration by establishing standards for sustainable practices that supply chain partners must follow (Yang & Lin, 2020). Compliance with environmental regulations can facilitate collaboration and aid in minimizing supply chain risks (Benzidia et al., 2021).

SCM Policies

The impact of effective supply chain management (SCM) policies on supply chain collaboration can be extensive (Wuni & Shen, 2023). Organizations implement SCM policies to manage the passage of products, services, and data throughout their supply chain. SCM policies can promote supply chain stakeholders' coordination and planning (Luo et al., 2020). The establishment of mutual planning and forecasting, collaborative inventory management, and shared risk management can facilitate collaboration and reduce supply chain disruptions (Duong, & Chong, 2020). SCM policies can encourage continuous development among stakeholders in the supply chain. Policies that encourage

innovation, collaboration on the development of new products, and process enhancement can strengthen supply chain relationships and improve supply chain performance. SCM policies can facilitate supplier development, thereby enhancing the capabilities of supply chain partners and supporting collaboration (Birkel & Hartmann, 2020). The establishment of training programs, the provision of technical assistance, and the promotion of partnerships can aid in building trust and encouraging collaboration among supply chain partners (Darling-Hammond et al., 2020). SCM rules that promote transparency, coordination, planning, performance measurements and incentives, continuous improvement, and supplier development may increase supply chain cooperation (Florescu et al., 2019). SCM rules may improve supply chain performance, lower costs, and increase customer satisfaction (Zhao & Hou, 2022; Khan et al., 2020).

Role of Information Technology

IT helps supply chain coordination (Munir et al., 2020; Jimenez-Jimenez, 2019). IT systems let supply chain partners share information, coordinate activities, and communicate (Asamoah et al., 2021). IT solutions allow supply chain participants to track items, services, and data in real time. This visibility allows supply chain stakeholders to swiftly detect and address issues (Modgil et al., 2022; Kayikci et al., 2022). Collaborative planning solutions help supply chain members plan and predict. These systems help improve decision-making and reduce miscommunications by offering a single source of supply chain data (Tiwari et al., 2023). By eliminating human data input and paperwork, IT systems help improve supply chain communication and information sharing. This can enhance collaboration by facilitating communication and decreasing the likelihood of making mistakes. By providing supply chain visibility, collaboration platforms, communication and information-sharing, analytics and data insights, and supply chain automation, information technology plays a crucial role in facilitating supply chain collaboration (Rao et al., 2021). By leveraging IT systems and tools, supply chain partners can enhance collaboration, reduce costs, and boost performance (Ebinger & Omondi, 2020; Annosi et al., 2021).

H1: Information technology mediates the relationship between legal framework and supply chain collaboration.

H2: Information technology mediates the relationship between SCM policies and supply chain collaboration.

METHODOLOGY

Population and procedure

This study is based on primary data collected using a questionnaire adapted from earlier research and the survey method (Sileyew, 2019). Due to their privacy concern policy, respondents were asked to complete an online questionnaire via Google Form, and the link to the questionnaire was shared via various social media platforms, including WhatsApp, e-mail, and Facebook, with the relevant HR department. Considering this, the demographic of the present study consists of firms operating in the manufacturing sector. Middle-level only volunteered to complete the survey voluntarily. The employee's identity was not disclosed. From January 2023 to March 2023 (three months), data will be collected. A total of 300 questionnaires were distributed to employees of Pakistani manufacturing companies. After data cleansing, however, only 250 questionnaires were considered by the authors. Consequently, the response rate for this research is 83%.

Measurement

The legal framework is taken from the research of Soita (2015). Items are “The Ministry has close collaboration with suppliers to perform logistics synchronization, The Ministry regularly visits/ face to face communication with our partners to facilitate collaborative relationship, The Ministry has close collaboration with suppliers to perform logistics synchronization and Most government ministries lacks management capacities to administer supply chain partnerships”.

The SCM policies is taken from the research of Soita (2015). Research Items “Supply chain collaboration practices leads to organizational effectiveness, Supply chain collaboration practices results to increased productivity, supply chain collaboration practices have led to improved product/ service quality and prequalification enhances supply chain relationships”.

The Information Technology is adopted from the research of Soita (2015). Items are “There is lack of computerized supply chain management system, the Ministry’s trading partners exchange information that helps in joint business planning to align goals, most suppliers lack ICT skills to participate in public e-procurement and supply chain complexity hinders visibility of supply chain collaboration in the sector”.

The supply chain collaboration is taken from the research of Soita (2015). Research Items “The need to develop closer relationships with key suppliers affects effectiveness of supply chain collaboration, information on tendering is widely shared between the ministry and potential suppliers, late/delayed payments discourage suppliers from entering into long-term commitments with government ministries and there is high level of collaboration with stakeholders in the supply chain in this ministry”.

Statistical Tools

In the present study, structural equation modeling (SEM) is used to examine the proposed hypothesis (Irfan et al., 2021). SEM helps confirm the validity of existing theories through numerical evidence. Consequently, the SEM is used to validate the relationship between latent variables and their respective factors. In addition, 5,000 bootstrap samples were utilized as a subsample. Smart-PLS should be considered when addressing complex models such as mediation or moderation (Haider et al., 2023).

RESULTS AND DISCUSSION

Reliability and Validity

Both reliability and validity are crucial in research because they ensure that measurements and findings are accurate and meaningful (Sürücü & MASLAKÇI, 2020). A measurement that is both reliable and invalid may produce consistent results, but these results may not be relevant or accurate (Vabalas et al., 2019). A valid but unreliable measure might yield accurate results, but these results may not be consistent across time or conditions. Cronbach's alpha, composite reliability, and average variance extracted (AVE) are used to assess the internal consistency and reliability of an instrument or questionnaire (Shrestha, 2021). These measures are frequently employed in exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). To ensure the internal consistency and reliability of a scale or questionnaire, researchers typically look for high Cronbach's alpha, composite reliability, and AVE values (Hair et al., 2021). It is essential to bear in mind the subject of the research and the characteristics of the assessed construct when evaluating these results. Table 1 and Figure 1 display the Cronbach alpha, composite reliability, and average variance extraction (AVE) values, which are all greater than the recommended levels. These findings indicate that a hypothesis can be tested and that the reliability and validity of the study have been established.

Table 1: Reliability and Validity (Instrument)

Factors	Item SPSS coding	Factor loading	Cronbach alpha value	Composite Reliability	Average Variance Extraction (AVE)
Legal framework	LF1	0.757	0.846	0.897	0.685
	LF2	0.870			
	LF3	0.837			
	LF4	0.843			
SCM policies	SCMP1	0.853	0.877	0.915	0.730
	SCMP2	0.865			
	SCMP3	0.867			
	SCMP4	0.834			
Information Technology	IT1	0.855	0.861	0.906	0.706
	IT2	0.843			
	IT3	0.874			
	IT4	0.788			

Supply chain collaboration	SCMC1	0.817	0.849	0.899	0.689
	SCMC2	0.849			
	SCMC3	0.869			
	SCMC4	0.783			

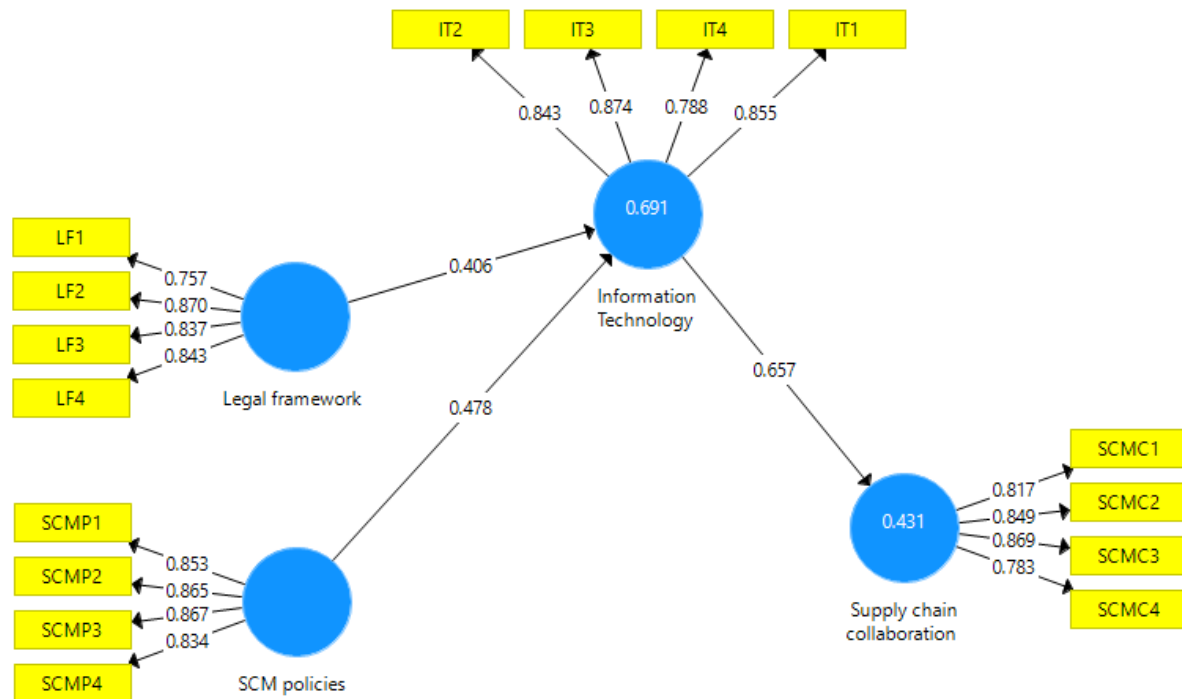


Figure 1: Model Fitness

Hypothesis Testing

This study examines the impact legal framework of on supply chain collaboration in Sindh, Pakistan, manufacturing firms. Table 2 reveals that direct effect, have positive and insignificant beta values; the T- value is 0.182 and 1.801 respectively. In addition, alternative hypotheses H1 is rejected for this investigation. Therefore, it is indicated that legal framework does not plays role for supply chain collaboration in Sindh, Pakistan manufacturing firms. In addition to this, this study examines the function of information technology as a mediator between legal framework planning and supply chain collaboration in Sindh, Pakistan, manufacturing firms. Table 2 reveals that indirect effect, have positive and significant beta values; the T- value is 0.004 and 0.135 respectively. In addition, alternative hypotheses H3 is accepted for this investigation, and a full mediation effect is demonstrated. Therefore, it is indicated that information technology plays a mediating function between legal framework and supply chain collaboration in Sindh, Pakistan manufacturing firms. The findings are shown in Table 2 and figure 2:

This study examines the impact SCM policies on supply chain collaboration in Sindh, Pakistan, manufacturing firms. Table 2 reveals that direct effect, have positive and significant beta values; the T- value is 0.639 and 6.174 respectively. In addition, alternative hypotheses H2 is accepted for this investigation. Therefore, it is indicated that SCM policies does plays role for supply chain collaboration in Sindh, Pakistan manufacturing firms. This study examines the function of information technology as a mediator between SCM policies and supply chain collaboration in Sindh, Pakistan, manufacturing firms. Table 2 reveals that indirect effect, have positive and significant beta values; the T- value is 0.005 and 0.129 respectively. In addition, alternative hypotheses H4 is accepted for this investigation, and a full mediation effect is demonstrated. Therefore, it is indicated that information technology plays a mediating function between SCM policies and supply chain collaboration in Sindh, Pakistan manufacturing firms. The findings are shown in Table 2 and figure 2:

Table 2: Hypothesis Testing

Path effects	Directions of Paths (SEM)	Value of Beta	T-value	Remarks
H1	Legal framework -> Supply chain collaboration	0.182	1.801	Not supported
H2	SCM policies -> Supply chain collaboration	0.639	6.174	Supported
H3	Legal framework -> Information Technology -> Supply chain collaboration	0.004	0.135	Full mediation effect
H4	SCM policies -> Information Technology -> Supply chain collaboration	0.005	0.129	Full mediation effect

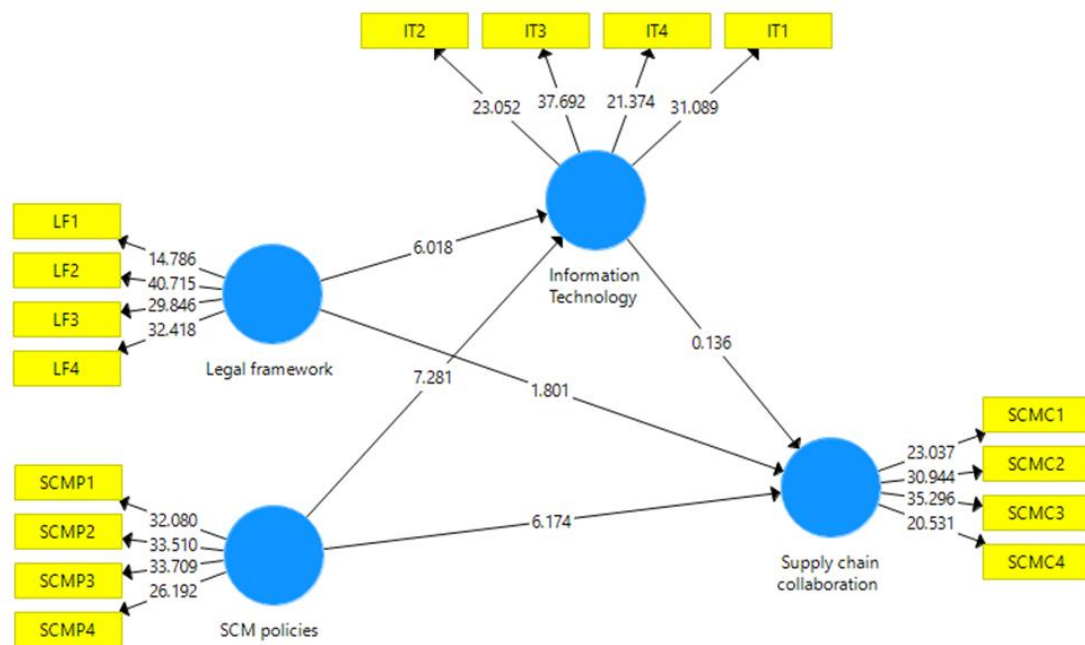


Figure 2: Structural Equation Modelling

DISCUSSION AND CONCLUSION

The study indicates that supply chain collaboration is a worthwhile objective, as it helps to establish a common timing of information sharing, replenishment, and supply synchronization, thereby reducing excess inventory and the costly bullwhip effect that is prevalent in many organizations (Ghazal et al., 2021). The research suggests that collaborative efforts within the supply chain should span the entire supply chain in order to accelerate essential processes such as product development and pricing, reduce costs, and enhance responsiveness to customer demand (Solaiman et al., 2022; Baah et al., 2022). In addition, the study indicates that organizations that employ sustainable supply chain management as a strategic business management instrument are likely to have a competitive advantage over others (Habib et al., 2021; Kouhizadeh et al., 2021). To assure visibility across all supply chain processes in government ministries, the study suggests a new level of work order status visibility (Messina et al., 2020). In addition, it is suggested that enhanced technology adoption is required to assure efficient information transmission (Chang et al., 2019). To achieve maximum effectiveness and efficiency in the supply chain, material flows, cash flows, and information flows must be managed in an integrated and holistic manner, with the overall service and cost objectives as the driving force. When automating these processes, it is crucial that the

relevant stakeholders support the information-sharing, collaboration, and monitoring activities required to effectively manage the relationship with other supply chain stakeholders (Lee et al., 2021; Rashid et al., 2021).

Managerial Implications


This research shows that supply chain cooperation requires a supportive legal environment and effective supply chain management strategies. It also emphasizes how information technology improves supply chain partner cooperation. Managers should emphasize rules and procedures that enable supply chain players to share information and resources, according to the report. They should also buy supply chain management software and data analytics solutions to aid collaboration. Supply chain administrators must also provide a legal framework that encourages cooperation and protects all supply chain stakeholders. This may involve creating contracts with explicit expectations and dispute resolution methods.


Future Research Directions

First, future research could investigate the effect of specific legal regulations on supply chain collaboration. For instance, supply chain collaboration could be studied in relation to intellectual property laws, environmental regulations, and labor laws. Culture can also play an important role in determining supply chain collaboration. Future research could investigate how cultural differences impact supply chain collaboration and how information technology can be used to tackle them. Future research could also investigate the effect of supply chain collaboration on firm performance. This could help organizations conceptualize the benefits of collaboration and substantiate investments in collaboration-supporting information technology and SCM policies.

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