Effects of Supply Chain Strategy (Lean, Agile, Hybrid) on Saudi Firm Performance: Exploring Mediating Role of Supply Chain Integration

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ABSTRACT

Competing in dynamic and competitive markets requires firms to strengthen their supply chain strategies to improve firm performance. The study investigated the impact of supply chain strategy, lean, agile and hybrid, on firm performance in Saudi Arabia. The mediating role of supply chain integration was also determined. Data was collected from manufacturing firms in Saudi Arabia. Employees working in supply chain operations, warehouse operations and logistics planning were targeted through purposive sampling. Reliable measurement items from the literature were used to develop the questionnaire, and a sample of 110 complete responses was obtained. Structural equation modelling was used to analyze the structural linkages. The findings revealed that the agile supply chain significantly impacts Saudi firms' performance out of the three strategies. Supply chain integration significantly mediates the relationship between agile and lean supply chains and firm performance. Therefore, Saudi firms put greater emphasis on the agile supply chain strategy's responsiveness, reliability and speed to improve firm performance. The research provides valuable and significant implications for supply chain management and practitioners to critically evaluate their supply chain strategy and capabilities to enhance supply chain responsiveness for improving firm performance.

KEYWORDS: Agile Supply Chain, Firm Performance, Saudi Arabia, Supply Chain Integration, Supply Chain Strategy

INTRODUCTION

The effective and efficient role of supply chain influence the organizational performance and success that represent the development of the nation. The phenomenon of organizational performance have been occurred in literature and the concept has been well explained and discussed, however, it is difficult to extract the one single definition as several aspects of performance has been coined (Alnuaimi et al., 2021). The research scholars have described that market customers, inputs and capital are indicators of organizational performance (Al Marzouqi et al., 2021). The firms have their own standards of performance to be measured as usually the marketing approach, the utilization and influence of human resource practices and

relevant strategies that assist in defining the phenomenon of the organizational performance and required for organizational success in modern era. The organizations strive to enhance the financial performance, market performance, the shareholder return, these measurable aspects assist in devising the strategies for effective and influential organizational performance. There are number of ways for measuring organizational performance including balance scorecard, benchmarking, process reengineering, quality management and effective performance measurement that brings the quality in the business operations (Alzoubi & Inairat, 2020).

The effective and efficient supply chain practices enable the firms to acquire the raw material, design and develop the product and distribute them among the potential consumers while being eco-friendly practices to reduce the negative impact and for ensuring the environmental protection. Supply chain approaches have gained attention due to supply chains being more intricate due to erratic needs and a challenging world economy. Today, in highly competitive era the business practices have been altered due to environmental changes for being more effective and efficient and most importantly responsive towards the environment protection, the effectiveness of supply chain practices helps to reduce the disruption, enable the firms to meet the consumer demands while being eco-friendly. A supply chain's layout must be in line with a company's objectives and tactics from a comprehensive supply chain management standpoint, and supply chain strategies serve as an equilibrium relationship between a company's advanced-level approach and its supply chain operations (Qi et al., 2017). A successful supply chain plan concentrates on satisfying consumers, increasing availability, enhancing customer worth, supporting economic security, and developing a robust system. The implementation of effective and efficient supply chain addresses the time span issues, the delivery time reduction is one of the most important factor to be achieved through effective utilization of resources and supply chain management practices, the effective and efficient supply chain management practice enable the firms to increase the productivity through maximum resource utilization and also influence and ensure the efficient cash management. The efficient and effective supply chain practices enable the firms to reduce the hazards and reduce the chances of failure of business operation occurred due to weak supply chain practices. The time management, enhance production, effective and efficient utilization of resources, fulfilling the customer demand, and effective cash management play significant role in achieving the sustainable competitive advantage.

Nevertheless, despite this broad understanding, numerous businesses run supply chain operations that either don't meet or exceed their requirements as a firm (von Falkenhausen, Fleischmann, & Bode, 2019). It is advantageous for businesses to run a distribution network that is simultaneously lean and agile in the modern, vibrant economy. An agile and Lean supply management approach is referred to as a hybrid supply chain management. By eliminating all non-value-adding processes, lean management creates an effective system that can be as adaptable as needed. Even though reducing waste is a must in becoming agile, adaptability is not necessary to become lean (Qamar, Hall, & Collinson, 2018). Lean management patterns acquire an edge over its competitors through productivity, which lowers the internal and exterior variations of similar elements; however, agile manufacturing systems can regulate such fluctuations and benefit from their agility. Lean practices focus on defining value, recognizing value streams, preventing pauses in value flow, allowing users to draw value, and beginning to pursue perfectionism towards becoming optimized value generators which are more adaptable in reacting to various consumer requirements (Nakandala & Lau, 2019).

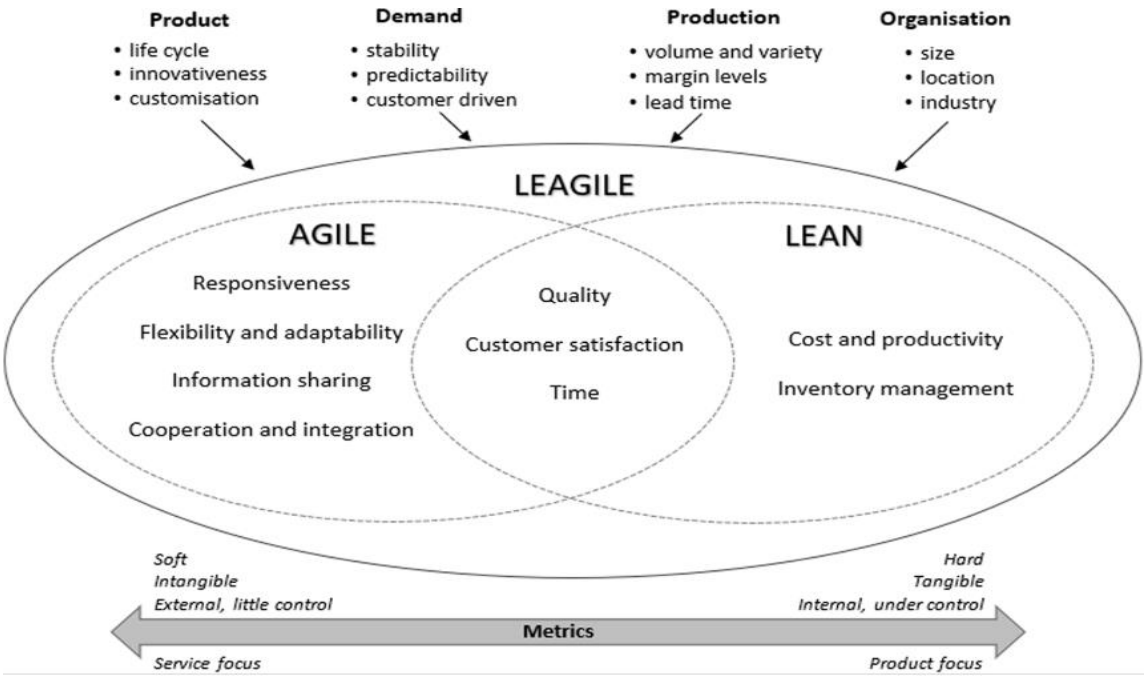

Figure 1: A paradigm for evaluating the success of supply chain performance (Source: Piotrowicz, Ryciuk, and Szymczak (2021))

Long-term organizational success depends progressively on supply chain strategies. Businesses must connect with their consumers, partners, and work closely with them if they want to prosper. Supply chain strategies have a direct and indirect impact on business performance. Excellent efficiency is a direct consequence of the joint relations between the businesses in the distribution network. This can indirectly assist businesses in identifying and removing the processes that fail to improve the supply chain. This might enhance productivity and cut manufacturing costs, which would result in greater growth and profitability and more client satisfaction. Many tasks that were once carried out within the confines of organizations—such as the acquisition of raw materials, stock management, and delivery of goods—now take place at the supply chain level. Businesses have acknowledged they are unable to succeed by themselves and need the assistance of other supply chains participants, such as clients and suppliers. According to analysts, supply chain integration and participant collaboration are advantageous. SCI is listed as one of the crucial variables affecting how well a corporation performs (Hendijani & Saeidi Saei, 2020).

The aims of this study are:

1. To determine the effects of Supply Chain Strategy (Lean, Agile, Hybrid) on Firm Performance, particularly in Saudi Arabia
2. To determine the role of Supply Chain Integration on Firm Performance

By defining the key indicators relevant to the lean, agile, and hybrid approach and their implications on organizational performance, this study is expanding the understanding of measuring supply chain performance. It might serve as the basis for designing an organizational and later supply chain performance management system. This paper is divided into various sections. The sections are organized as follows, i.e., the first section is an introduction, 2nd section includes literature review, then methodology, following results and discussion.

LITERATURE REVIEW

Numerous papers have explored lean and agile strategies, and it has been highlighted that firms should choose a supply chain approach that is suitable for their goods' features and external factors. For instance, cost reduction and upholding strong mean usage levels have been used to gauge how lean a supply chain is. In contrast, surplus reserve space and the ability to adapt to unforeseen demand have been used to gauge how agile a supply chain is. However, a company's concentration on both aspects and desire to offer products at lower prices in order to react swiftly to market developments are considered a hybrid strategy. Every supply chain structure's primary objective is to optimize outcomes and improve one's competitive edge (Srinivasan, Srivastava, & Iyer, 2020; Zimmermann, Ferreira, & Moreira, 2020).

Lean supply chain and Firm performance

Regarding the lean approach, the most frequently and often utilized indicators for assessing lean supply chain methods include the just-in-time approach, sharing of information, vendor connections, client associations, and waste minimization. Better quality, improved reactivity, lower expenses, reduced stock quantities, increased output, shortened turnaround time, and fewer outages are all advantages of adopting a just-in-time technique. The goal of information circulation across SC members is to gather and disseminate information in order to enhance decision-making, functions, reactivity, and service standards. Precision, adequacy, speed, and veracity of transferred knowledge are all qualities of shared information that improve SC effectiveness. Vendor associations are anticipated to save expenses and boost the degree of trust, strengthen SC collaborators' technical and structure capacities, increase their degree of accountability, synchronize their abilities, establish learning habits, and cut or do away with unnecessary tasks and time. Additionally, it might incorporate risk and benefits participation, long-term agreements, reciprocal quality enhancement initiatives, and interconnected procedures. The literature has reported a variety of advantages of client relationships, such as enhanced client loyalty, increased issue-resolving techniques, improved awareness and specialist knowledge exchange, increased comprehension of user requirements, improved attentiveness to clients, better ability to differentiate products, and elevated market base. These components of a lean supply chain and their favorable outcomes lead to better supply chain performance which affects overall firm performance (Berger, Tortorella, & Rodriguez, 2018; Garcia-Buendia, Moyano-Fuentes, & Maqueira-Marín, 2021; Nimeh, Abdallah, & Sweis, 2018).

H1: Lean supply chain management practices strategy influence the firm performance.

Agile Supply chain and Firm Performance

In the case of the agile approach, agility in the supply chain helps firms compete effectively by enabling them to adapt to client demands for product development, quality, and throughput times. Duration to market pace is a crucial success metric that helps businesses differentiate themselves from the competition. Businesses can attain this objective with the aid of agility. It enables them to rapidly respond to shifts in demand and availability as well as manage exterior disturbances. The reactivity and agility of the supply chain have a significant impact on the duration to market pace. SC elasticity is required for this agility, which is demonstrated by response speed. Lack of this adaptability will cause delayed responses (Benzidia & Makaoui, 2020; Umam & Sommanawat, 2019).

A truly lean supply chain was seen as ideal in the past for businesses that produced functional goods because they had to concentrate solely on expense cutting. The agility component of the supply chain might be disregarded, given that efficiency gains would aid businesses in maintaining their competitiveness. Extreme competition and users' rising standards and preferences, though, have compelled companies to engage in agile supply systems in addition to increasing their leanness in the current years. The implementation of hybrid supply chain solutions, as opposed to just lean or agile models, is the result of this transition. Many firms prefer a hybrid approach to consider both aspects. Also, it is found that most firms have both components in them. Although some research suggests that better firm outcomes are possible when a supply chain is more evenly distributed in aspects of leanness and responsiveness, it is important to emphasize that this conclusion does not indicate that the fifty-fifty stance is ideal for all kinds of businesses and sectors. It mainly depends on the environment and surrounding according to which the strategy should be selected that would be beneficial and positively influential toward the firms' performance (Abdelilah, El Korchi, & Amine Balambo, 2021; Fadaki, Rahman, & Chan, 2019, 2020).

H2: Agile supply chain management practices and strategy influence the firm performance.

Hybrid Supply chain and Firm Performance

The socially responsible supply chains play role in sustainability of supply chain, it has been established that research on supply chain without sustainability has imperfect, as sustainable development goals set in year 2015 might be achieved in year 2030 through implementation of effective supply chain management and practices in lower-income countries (Dey et al., 2020).

There are number of different supply chains in various industries in several diverse ways due to diminishing perspective of the goods that requires the effective supply chain management practices (Babazadeh & Sabbaghnia, 2018). The sustainability of the supply chain explained as the inter-organizational practice that relates to the environmental issues that responds towards the environmental protection all along the supply chains. The practices related to the sustainability of supply chain assists in generation of new ideas, optimal utilization of the resources, capabilities, productivity and their focus on maintaining the environment and related aspects, as the prime concern is to preserve the environment (Afum et al., 2020). The firms that have considered and implemented the practices responsive towards the environment, such as eco-friendly investments have taken the firm away from the traditional competition and given them edge on the emergence practices and enable firms to gain long-term sustainable competitive advantage. The sustainability of the supply chain management enable the firms to become sustainable, the operations of firms become more environmental friendly and extend their capabilities towards emerging market opportunities (Aisjah & Prabandari, 2021).

The hybrid supply chain strategy consists on both lean and agile practices for sustainability of the effective supply that enable the firms to gain advantage. It has been reported that dynamic pricing and effective transport has the tendency to reduce the negative effects as the traffic conditions has become terrible, so effective supply chain management practices are much needed in order to reduce the disruption and increase the performance of the firs. There are number of issues and challenges have to be taken into consideration including fuel consumption, traffic effects, the diverse capacities of the motor vehicles, the speed associated with the capacity of the vehicles that impact the environment and economic perspective. The

effective practices create the level of satisfaction and address the different issues related to the traffic and other challenges (Abbasian, Sazvar, & Mohammadisiahroudi, 2023).

H3: Hybrid supply chain strategy has a positive and significant impact on firm performance.

Mediating Role of Supply Chain Integration

A situation known as supply chain integration (SCI) is one in which participants in the supply chain cooperate and operate together to improve output and profits while satisfying consumer needs. Coordinated business information and product flows would result in the best supply chain practices. It entails the coordination of company operations between a company's internal departments and its supply chain affiliates in order to decrease expenses, boost value proposition, and improve supply chain effectiveness for all parties (Kumar et al., 2017). It is determined that, as a result of integration inside organizations, aligning the company's operations and risk transfer and company data, such as market predictions, stock levels, and manufacturing scheduling decisions, may improve favorable firm effectiveness. The research demonstrates that integration can be translated into competitive abilities, leading to good outcomes, according to considerable research on the links between integration and firm success (Mafini, Dhurup, & Madzimure, 2020; Perdana, Ciptono, & Setiawan, 2019).

When a firm employs an agile strategy, integration helps them achieve its objectives. It is easier for supply chain partners to respond swiftly to shifts in the market, whether they are long-term or short-term when there is effective communication between parties. It has been discovered that supply chain integration helps to reduce the lead times between operations and enhance the readiness of goods. The development of a portal for the gathering and consolidation of information throughout the entire supply chain through network linkage between producers, vendors, and consumers enhances supply chain visibility and additionally guarantees on-time distribution and supply chain agility. Collaborative decision improves producers' capacity for managing a broad spectrum of data, while information exchange and network interconnection assist the producer in acquiring and applying knowledge in the supply chain. Decreased stocks, accelerated manufacturing phases, and increased agility can all be achieved with reliable, sufficient, and fast supply-chain data (Creapeau & Hansen, 2022; Feyissa, Sharma, & Lai, 2019; Shou et al., 2018).

The establishment of a solid strategic alliance with vendors will make it easier for them to comprehend and understand the requirements of the company and more effectively satisfy its evolving needs. They can coordinate their own manufacturing plans and shorten timeframes by working with suppliers and sharing details about their goods, procedures, schedules, and objectives. Suppliers obtain a superior standard of client service, which assists producers in enhancing their consumer service by building a shared insight into the company's procedures and system (Errassafi, Abbar, & Benabbou, 2019). According to research, companies' functional performance can be improved by exchanging data and collaborating with their key clients and partners. Coordination throughout the supply chain enables businesses to precisely identify client demands and cater to them. Through this, parties may reduce supply chain delays and promptly adapt to changing market conditions by collectively developing demand projections and schedules. Given the high degree of sector environment unpredictability that necessitates product modification and innovation, the intricacy of product and data flows, and the complexity of company operations, this is

seen as a comparative strategy for the producer (Hendijani & Saeidi Saei, 2020). Further, when companies have adopted a cost-efficient lean strategy, the coordination with partners assists in other ways toward the strategic goals. When in an integrative collaboration, the company, its providers, and clients also come to decisions about how to create systems and services, how to enhance quality, and how to cut prices (Pakurár et al., 2019). Supply chain integration with collaborations creates a decisive victory that enables businesses to look for the most cost-effective potential solutions to lower expenditures throughout the supply chain, including production, warehousing, and transfer expenses, and it increases the revenue of each supply chain partner. As a result, supply chain collaborators can gain a lot from sharing expertise, including decreased operational expenses and turnaround time, as well as increased agility and creative capacity. In the hybrid strategy, the firm looks forward to controlling its costs and enhancing the quality of innovative products; in this case, the company will enjoy both benefits through the integration of the supply chain with customers, suppliers, and within the firm. (Khanuja & Jain, 2019; Patrucco et al., 2020).

H4: The relationship between lean supply chain management practices and firm performance mediated by the supply chain integration

H5: The relationship between agile supply chain management practices and firm performance mediated by the supply chain integration

H6: The relationship between hybrid supply chain management practices and firm performance mediated by the supply chain integration

Theoretical Framework

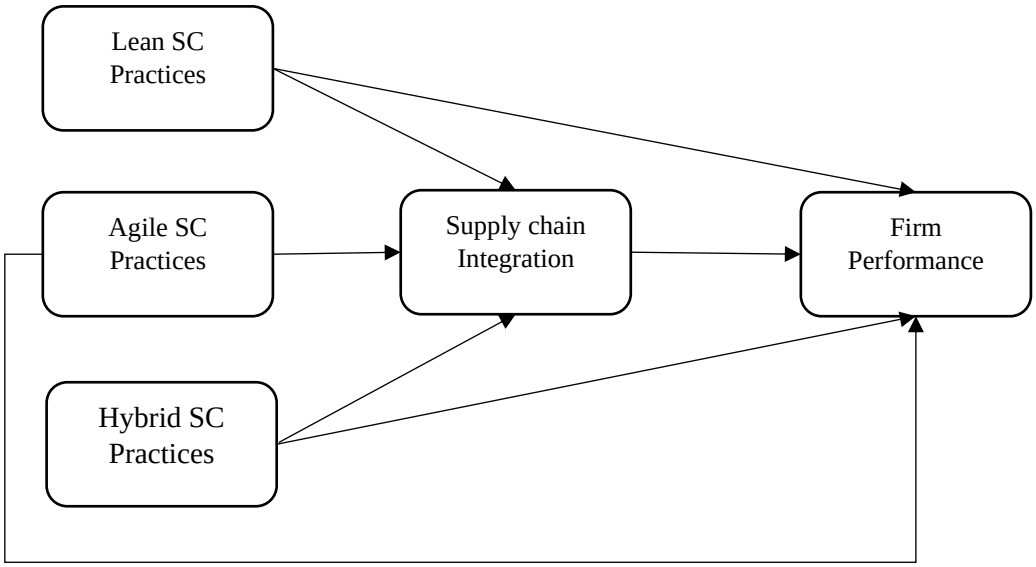

Figure 2: Theoretical Framework

METHODS

The current study assessed the effect of supply chain strategy (SCS) on firm performance (FP) in Saudi Arabia. Furthermore, the study explored the mediating role of supply chain integration

(SCI) between the association of SCS and firm performance. The researcher reviewed the literature and existing theoretical frameworks to develop the constructs, and measurement items were adopted from the literature. A quantitative research method focused on objectivity is adopted (Hair, Page, & Brunsveld, 2019). The research methodology and data analysis technique are further elaborated in this section.

Population and Sampling

This research effort focused on the relation between supply chain practices and firm performance with mediating effect of supply chain integration, therefore, the target audience was the employees related to supply chain operations, warehouse operations and logistics planning in various firms in Saudi Arabia. The researcher adopted a purposive sampling technique for data collection. The purposive sampling allowed the researcher to target the relevant population so appropriate responses are received for evaluation (Mweshi & Sakyi, 2020). The researcher conducted a thorough review of the various manufacturing firms and reached out to the employees. The employees were informed about the research objectives, and voluntary participation was ensured. The researcher aimed to obtain a sample size of 400 for statistical analysis (Wolf et al., 2013). Approximately 500 surveys were distributed to firms through mail and e-mail administration.

Data Collection

The employees in the firms employed in the supply chain operations were contacted through e-mail and social media. The surveys were sent to different firms and shared through e-mail for better reach and to increase the response rate. Measurement items were adopted from the literature, and a questionnaire was developed by incorporating questions regarding the demographic profile and the constructs under study. Employees consented to participate in the research and were assured confidentiality and anonymity throughout the research process. Participation was voluntary, and the researcher followed up with managers who agreed to participate. Out of the 500 questionnaires, 127 questionnaires were obtained. However, only 110 questionnaires were retained for data analysis due to recurrent values and missing data.

Measurement Scale

The measurement scales are presented in the table below. The researcher utilized numerous existing studies to develop a suitable scale for measuring the items. Firstly, supply chain agility was measured using 4 items for reliability, speed, responsiveness; adapted from Swafford, Ghosh, and Murthy (2006). The low-cost element of the lean supply chain management strategy was measured by the scale of Qi and Sheu (2011), and quality performance was adopted from Jasti and Kodali (2015). Two other items were adopted from Vonderembse et al. (2006). Similarly, hybrid strategy was adopted from the works of Qi and Sheu (2011). Four items are used to measure firm performance (Qi, Boyer, & Zhao, 2009; Selldin & Olhager, 2007). Lastly, supply chain integration that includes items for integration within the firm and with customers and suppliers were adopted from two studies Chang, Tsai, and Hsu (2013) and Kim (2009). The constructs were measured through the 5-point scale that ranges from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”).

Table 1: Measurement Scale

Variables	No of items	Developed by/ adapted by
Supply Chain Agility	4 items	(Swafford et al., 2006)
Lean Supply Chain	4 items	(Qi & Sheu, 2011), (Jasti & Kodali, 2015), (Vonderembse et al., 2006)
Hybrid Strategy	3 items	(Qi & Sheu, 2011)
Firm Performance	4 items	(Qi et al., 2009), (Selldin & Olhager, 2007)
Supply Chain Integration	6 items	(Kim, 2009),(Chang et al., 2013)

Data Analysis

The analytical framework for evaluating the linkages in our study was tested using a confirmatory factory analysis in structural equation modelling (SEM) to establish the consistency of the scale items (Vinodh & Joy, 2012). Convergent and discriminant validity and KMO and Bartlett's Test of Sphericity are conducted to validate the constructed research model. Similarly, the association between SCS and FP, and the mediating impact of SCI on the linkage between SCS and FP are investigated through SEM.

RESULTS

Respondents' Demographic

Out of 110 respondents, 42.4% of the respondents were female, and 57.6% were male.

Descriptive Results

Table 2 shows the descriptive statistics, which presents a convenient data summary supporting analyzing the data's characteristics (Zikmund et al., 2013). The skewness values for the variables range between -0.5 to 0.5 showing that the data is fairly symmetrical and normal (Hair et al., 2018).

Table 2: Descriptive Statistics

	N	Min	Max	Mean	SD	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
SCA	110	1.00	5.00	3.0317	1.34281	-.018	.136
LSC	110	1.00	5.00	3.0410	1.27554	-.021	.136
HS	110	1.00	5.00	2.7441	1.13048	.161	.136
FP	110	1.25	4.75	3.2276	.65649	-.237	.136
SCI	110	1.00	5.00	3.1914	.93532	-.202	.136
Valid N (listwise)	110						

SCA= Supply chain agility, LSC= Lean supply chain, HS=Hybrid Strategy, FP= firm performance, SCI= Supply Chain Integration

Validity, Reliability, and Measurement Model Tests

Table 3 shows the values for the composite reliability (CR), maximum shared variance (MSV) and average variance (AVE). The CR range, 0.817 to 0.925, falls in the acceptable range as the values are above 0.7 (Hair et al., 2021). Convergent validity is robust as AVE values are greater than 0.50. Furthermore, the discriminant validity benchmark is assured because AVE is greater than MSV.

Table 3: Discriminant and convergent validity

	CR	AVE	MSV	SCA	LSC	HS	FP	SCI
SCA	0.879	0.649	0.459	**0.841**				
LSC	0.920	0.680	0.432	0.563	**0.808**			
HS	0.880	0.761	0.472	0.374	0.644	**0.708**		
FP	0.817	0.569	0.364	0.360	0.575	0.619	**0.736**	
SCI	0.925	0.735	0.326	0.458	0.612	0.522	0.610	**0.720**

SCA= Supply chain agility, LSC= Lean supply chain, HS=Hybrid Strategy, FP= firm performance, SCI= Supply Chain Integration

The Bartlett's test confirms the multivariate normality of data. Table 4 shows that the p-value is below 0.05 and confirms that the data is satisfactory for further analysis (Pallant, 2020). Furthermore, the sampling in our study is adequate, as the KMO value is above 0.6 (Pallant, 2020).

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.941
Bartlett's Test of Sphericity	Approx. Chi-Square	8151.987
	Df	210
	Sig.	.000

Model Fitness

The model fitness was evaluated through confirmatory factor analysis. RMSEA is below 0.08, and the GFI, CGI, and IFI for the constructs are highly satisfactory as values are closer to 1 (Hair, 2009); therefore, confirming a perfect fit as displayed in Table 5.

Table 5: Confirmatory Factor Analysis

CFA Indicators	CMIN/DF	GFI	IFI	CFI	RMSEA
Threshold Value	≤ 3	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08
Observed Value	2.542	0.816	0.954	0.918	0.045

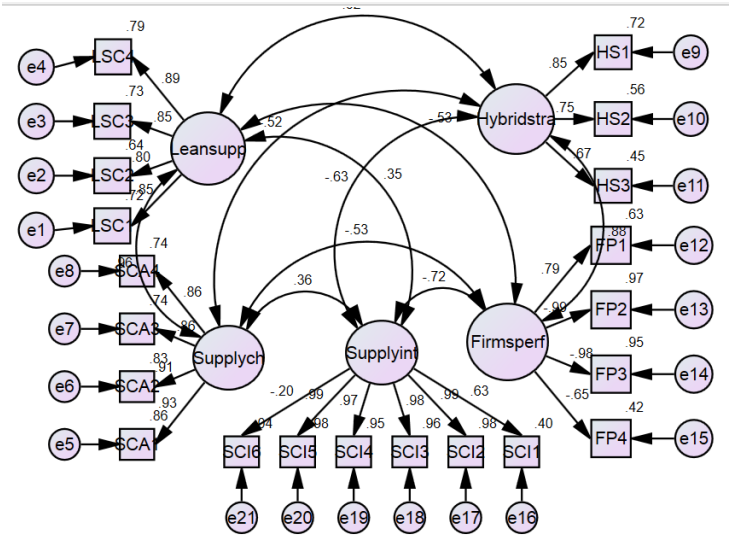

Figure 3: Measurement Model

Rotated Component Matrix

While studies have used factor loading of more than 0.3, the current study specified acceptable low factor loading at 0.4 (Stevens, 2012). There are no cross-loadings, as shown in Table 6.

Table 6: Rotated Component Matrix

	Component				
	1	2	3	4	5
SCA1	.883				
SCA2	.864				
SCA3	.840				
SCA4	.852				
LSC1				.850	
LSC2				.781	
LSC3				.825	
LSC4				.882	
HS1			.716		
HS2			.737		
HS3			.806		
FP1		.778			
FP2		.494			
FP3		.419			
FP4		.627			
SCI1					.506
SCI2					.928
SCI3					.915
SCI4					.913
SCI5					.929
SCI6					.969

SCA= Supply chain agility, LSC= Lean supply chain, HS=Hybrid Strategy, FP= firm performance, SCI= Supply Chain Integration

Structural Equation Modelling (SEM)

SEM evaluates the structural linkages between the latent and observed variables (Hair et al., 2021). Using a p-value at 0.05 significance level, the results shown in Table 7 verify the significant impact of supply chain agility on firm performance. A unitary increase in supply chain agility which measures the speed and quality of supply chain management, increases the firm performance by 15.4%. However, lean and hybrid supply chain strategies do not significantly impact firm performance. Therefore, it can be concluded that SMEs in Saudi Arabia are more focused on agile supply chain strategies to increase firm performance.

Table 7: Structural Equation Modelling

Hypothesized Path	Estimate	S.E.	C.R.	P	Conclusion
SCA → FP	.154	.046	10.721	0.01	Accepted
LSC → FP	.00	.011	.842	0.76	Rejected
HS → FP	-.29	.046	4.647	0.13	Rejected

SCA= Supply chain agility, LSC= Lean supply chain, HS=Hybrid Strategy, FP= firm performance, SCI= Supply Chain Integration

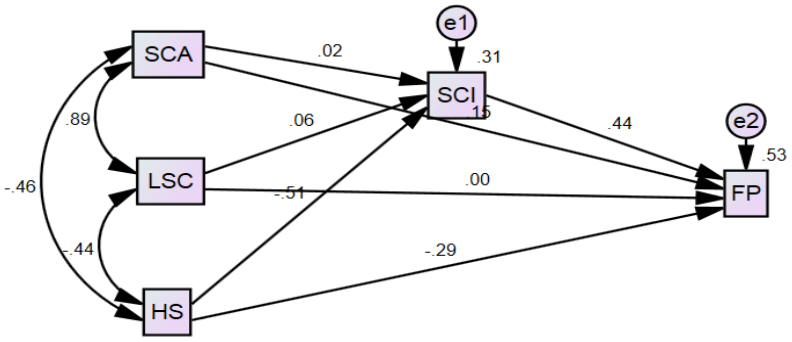

Figure 4: Structural Equation Modelling

Table 8 shows the results of indirect effect, confirming that supply chain integration plays a significant mediating role on the impact of SCA and LSC on FP. Hence, supply chain integration that focuses on communication within firm, with suppliers and partners significantly mediate the impact of agile and lean strategies on FP.

Table 8: Mediating Effect of Supply Chain Integration

	SCA	LSC	HS
SCI	.000	.000	.000
FP	.167**	.274*	.142

SCA= Supply chain agility, LSC= Lean supply chain, HS=Hybrid Strategy, FP= firm performance, SCI= Supply Chain Integration

DISCUSSION

The present research examined the effect of Saudi Arabian organizational effectiveness on supply chain strategy (SCS). The study also investigated how supply chain integration (SCI) affected the relationship between supply chain sustainability (SCS) and company performance. The managers of supply chain operations, warehouse operations, and logistics planning in diverse Saudi Arabian companies were the intended audience. For the purpose of gathering data, the researcher used a purposive sampling strategy. For statistical analysis, the 400-person sample size was the goal of the researcher. Using mail and email distribution, about 500 surveys were given out to companies. Nevertheless, only 323 questionnaires were kept for data analysis because of repeated values and incomplete information. The objectives of current study were to determine the effects of Supply Chain Strategy (Lean, Agile, Hybrid) on Firm Performance, particularly in Saudi Arabia and to determine the role of Supply Chain Integration on Firm Performance. Out of the three strategies, the results showed that the agile supply chain had the greatest impact on the performance of Saudi enterprises. The association between agile and lean supply networks and company performance is largely mediated by supply chain integration. As a result, Saudi businesses place more value on the agile supply chain strategy's adaptability, dependability, and efficiency.

Sriyakul, Prianto, and Jermsittiparsert (2019) looked into the connections among agile supply chain agility, supply chain management, and supply chain perspective in Indonesian SMEs. Additionally, the indirect connection across supply chain agility, supply chain management, and supply chain perspective was studied. In order to improve performance of the supply chain, the researchers' overall goal was to give a thorough and original theory as well as an empirical

analysis of why supply chain coordination helps companies implement supply chain agility. Agility is created by the supply chain participants working together. The results showed that supply chain efficiency and supply chain agility have a favorable and significant relationship. Jajja, Chatha, and Farooq (2018) proposed that organizational cost effectiveness is impacted by supply chain agility, including the capacity to execute distribution network procedures with comparatively few productive assets. For the rewards of agility and customization as well as the ability to respond to shifting business variables, agile supply chains necessitates specialized expenditures. As a result, the SC participants' cooperation, which is strengthened by agility, helps to discourage them from acting opportunistically and promote saving money and negotiations based on constrained logic (Dubey et al., 2018). The findings of this study are in accordance with the outcomes of present study that agile supply chain had the greatest impact on the performance of small and medium enterprises.

To meet consumer demands in a reasonable timeframe, agility has emerged as a major factor for all corporate strategy, particularly supply chain (SC) activities. Lean management is thought to have transformed into agile production because agile approaches may serve as a possible accelerator for lean management. Theoretically, this implies that agile competencies are progressively acquired in conjunction with lean competencies given that agile creation contains both some lean parts and more revolutionary innovative solutions (Ghobakhloo & Azar, 2017). It has been claimed that adaptability is a crucial performance indicator for identifying lean and agile operations. When contrasted to lean companies, agile businesses are substantially more adaptable. supply chain performance is viewed as a broader indicator of efficient supply chain management. The effectiveness of the supply chain, a crucial concept, can be significantly impacted by factors including planning horizon, personalization, and stock levels. This highlights that agile supply chain had the greatest impact on the performance of small and medium enterprises and agile and lean supply networks and company performance is largely mediated by supply chain integration.

Cerchione, Centobelli, and Shabani (2018) examined the effects of supply chain integration and sustainability orientation on SMEs' sustainable design and acquisition. According to researchers, SMEs should not only concentrate on organizational effectiveness but also ensure that strategies are integrated across their distribution network. The findings showed the positive association between supply chain integration and financial performance. The findings of this study are in accordance with the outcomes of present study that agile and lean supply networks and company performance is largely mediated by supply chain integration.

CONCLUSION

The company's capacity to predict and control the behavior of its supply chain collaborators is hampered by growing globalization, swift technology advancement, and shifting comparative edge. The current study looked at how Saudi Arabia's organizational effectiveness affected supply chain strategy (SCS). Furthermore, the study looked at how supply chain integration (SCI) impacted the link amongst supply chain sustainability (SCS) and business success. The data was collected from the managers of supply chain operations, warehouse operations, and logistics planning in diverse Saudi Arabian companies. Results indicated that supply chain integration, agile and lean distribution network, and firm performance are strongly mediated by each other. Agile supply chains had the considerable influence on the effectiveness of small and medium-sized businesses. This study adds to the body of knowledge and methods used to

study the management of SMEs. Addressing the problems linked to supply chain vulnerability, supply chain integration, and supply chain agility will be made easier by the present research for policymakers and professionals. It does, nonetheless, have some constraints, depending on which we can identify several areas for further study. Small and medium-sized firms make up the solely international sample under study. The findings could have been transferred to other nations with comparable traits. Future research should expand on this topic by examining similar connections in supply chains from other industries and in different nations.

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Appendix 1

Variable	Items	Reference
Supply chain agility	*Ability to rapidly improve level of customer service* *Ability to rapidly increase the level of product customisation* *Ability to rapidly improve delivery reliability* *Ability to rapidly improve responsiveness to changing market needs*	(Swafford et al., 2006)
Lean supply chain	*Our supply chain selects suppliers based on their performance on low cost and high quality* *Our supply chain frequently offers feedback to suppliers on their quality and delivery performance* *Our supply chain seeks to reduce lead time providing it does not increase costs* *Our supply chain reduces cost and time of transportation and warehousing*	(Qi & Sheu, 2011), (Jasti & Kodali, 2015; Vonderembse et al., 2006)
Hybrid strategy	*Our supply chain is designed to reduce cost and provide quick response to customers* *Our approach to selecting supplier is a mixture of cost and speed* *Our strategy is to reduce lead time and increase product customization*	(Qi & Sheu, 2011)
Firm performance	*Our business has higher return on sales than competitor* *Our business has experienced sales growth in the last three years* *Our business's market share has improved in the last three years* *Our business is more flexible than competitors*	(Selldin & Olhager, 2007), (Qi et al., 2009)
Supply chain integration	*There are cross-functional coordination and integration events and meetings within the company* *The company maintains data integration among internal functions through network* *The company has plans for coordination and integration with our suppliers* *The company establishes frequent contact with suppliers to maintain partnership* *The company maintains frequent communication with the customers* *The company engages with customers by sharing on market information*	(Kim, 2009), (Chang et al., 2013)