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THE RELATIONSHIP BETWEEN SUSTAINABLE SUPPLY CHAIN MANAGEMENT AND ORGANIZATIONAL PERFORMANCE IN JORDANIAN PHARMACEUTICAL SECTOR

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Abstract

Global health depends on drug discovery and delivery innovation by the pharmaceutical industry. Pharmaceutical companies can improve operational efficiency, reduce risks, and increase long-term profitability while improving social well-being and environmental stewardship by integrating sustainable supply chain management. This holistic strategy improves corporate performance and meets regulatory and consumer ethical demands. Hence, this study designs a model to enhance the organisational performance in the pharmaceutical industry in Jordan by enhancing the sustainable supply chain management. The study aimed to examine the impact of the sustainable supply chain management (environmental, socially and economically) on the organisational performance. The population of this study is all pharmaceutical companies, totaling 1,691. The study focus on top managers from each of these organizations as respondents. We used stratified sampling to distribute 313 questionnaires to the respondents. The data was analysed using SEM with SMART-PLS 4 in the study. The model's path coefficient in the structural equation model that tested the study's hypotheses and the measurement model that was used to assess the model's dependability and accuracy. All of the study's hypotheses were confirmed by the results. Hotel managers in Jordan can use the study's major implications to improve SSCM in three ways: environmentally, socially, and economically, which will boost their organisation's performance.

Keywords: Environmental SSCM, Economic SSCM, Social SSCM, Organisation Performance, Internal Processes, Learning and Innovation, Service Receiver.

1. INTRODUCTION

The pharmaceutical industry in Jordan is vital to the economy, healthcare system, and public health. As a pivotal sector in the region, it substantially contributes to employment generation, exports, and the availability of necessary pharmaceuticals (AlBrakat et al., 2023). Nonetheless, similar to other businesses, the pharmaceutical sector encounters various obstacles related to organizational performance, especially in domains such as internal processes, learning and innovation, and service delivery. Inefficiencies in these domains may result in increased expenses, diminished production, and decreased customer satisfaction.

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Enhancing performance within the sector is essential for both industry growth and the distribution of high-quality healthcare services to the people. Resolving these difficulties is essential for sustaining the sector's competitiveness and fulfilling the changing requirements of both domestic and foreign markets (Al-Awamleh et al.,2023). Organizational performance includes various aspects, such as internal processes, learning and innovation, and the delivery of services to recipients (Ali AlShehail et al.,2022). The dimensions outlined are crucial for pharmaceutical companies to maintain efficiency, competitiveness, and innovation. It is essential to enhance internal processes to guarantee intuitive operations, cost-effectiveness, and adherence to industry standards. Learning and innovation play a vital role in creating a culture of ongoing enhancement, allowing organizations to remain at the forefront of market trends and regulatory developments (Sharma & Modgil, 2020). Ultimately, delivering services to the receiver is crucial, as it has a direct effect on customer satisfaction and the overall efficiency of healthcare delivery.

In the realm of the pharmaceutical industry in Jordan, enhancing these dimensions holds particular significance given the sector's swift expansion, regulatory challenges, and the rising demand for superior products and services (Hu et al.,2022). The incorporation of sustainability into supply chain management (SCM) has become a vital element in improving corporate performance. Sustainable supply chain management (SSCM) integrates environmental, economic, and social factors into supply chain activities, enhancing efficiency, minimizing costs, and bolstering long-term resilience (Baliga et al., 2020). Pharmaceutical firms in Jordan can mitigate performance difficulties by implementing SSCM techniques, which promote sustainable operations, optimize resource utilization, and improve overall operational efficiency. Furthermore, sustainability in supply chain management is progressively emerging as a critical competitive advantage in the global marketplace, necessitating that enterprises adopt sustainable supply chain management concepts to enhance their performance and fulfill the expectations of consumers, regulators, and other stakeholders (Al-Madi et al.,2021).

SSCM comprises three fundamental dimensions: environmental SSCM, economic SSCM, and social SSCM. Each factor is crucial in resolving the performance challenges encountered by pharmaceutical businesses. Environmental SSCM emphasizes the reduction of the environmental impacts of operations, assisting organizations in lowering waste, energy usage, and pollution, while enhancing their operational efficiency (Shehadeh et al., 2024). Economic SSCM prioritizes cost minimization, profitability, and resource efficiency, hence enhancing financial performance and sustainability. Social SSCM pertains to the social responsibility of organizations, guaranteeing equitable labor practices, community involvement, and ethical supply chain management. By incorporating these three dimensions into their operations, pharmaceutical companies in Jordan may augment their overall performance, strengthen their competitive advantage, and promote the sustainable development of the sector (Alzubi& Akkerman, 2022). This research provides significant theoretical and practical importance within the context of Jordan's pharmaceutical sector.

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Theoretically, it enhances the comprehension of how SSCM influences organizational performance, offering significant insights into the correlations between sustainable practices and performance results. The report provides pharmaceutical companies in Jordan with assistance on using SSCM methods to enhance operations, enhance competitiveness, and promote sustainable development within the sector. This research examines the influence of SSCM on organizational performance, offering a basis for policymakers, managers, and industry leaders to promote a more sustainable and efficient pharmaceutical sector in Jordan.

2. PROBLEM STATEMENT

The Jordanian pharmaceutical sector is essential to the nation's healthcare system and economic growth; nonetheless, it encounters difficulties in improving organizational performance, especially in crucial domains such as internal processes, innovation, and service delivery (Khader et al.,2023). Despite substantial growth in the sector, inefficiencies in these areas constrain its competitiveness and responsiveness to market demands. Although sustainable supply chain management (SSCM) strategies have the potential to enhance performance, there is insufficient research on the specific effects of SSCM on these performance parameters in the context of Jordan's pharmaceutical sector (Shtawi et al.,2023).

This is a significant challenge for industry executives, since they lack definitive plans for incorporating sustainability into their operations to enhance performance. Despite extensive global research on SSCM across multiple industries, its impact on the performance characteristics of pharmaceutical organizations—namely internal processes, learning and innovation, and service delivery—remains little examined within the Jordanian context. The current literature does not offer a complete framework for understanding how the environmental, economic, and social elements of SSCM jointly influence these aspects in the pharmaceutical sector (Sharabati, 2021).

Pharmaceutical firms in Jordan urgently need to implement sustainable supply chain methods to overcome performance difficulties and improve their competitiveness. Nonetheless, in the absence of actual evidence or a comprehensive understanding of how SSCM affects organizational outcomes in this particular setting, organizations may find it challenging to execute effective initiatives (Shehadeh et al.,2024). This study aims to address both theoretical and practical gaps by examining the correlation between SSCM and organizational performance in the Jordanian pharmaceutical sector, offering critical insights to assist managers and policymakers in improving sustainability, efficiency, and innovation across the sector.

3. RESEARCH QUESTIONS

The study main question is "Is there an impact of SSCM management into three constructs (environmental SSCM, economic SSCM, social SSCM) on the organisation performance (internal processes, learning and innovation, service receiver) in the Jordanian pharmaceutical sector?”

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The study will try to answer the following questions:

1) Is there any impact of the environmental SSCM on the organisation performance in the Jordanian pharmaceutical sector?
2) Is there any impact of the social SSCM on the organisation performance in the Jordanian pharmaceutical sector?
3) Is there any impact of the economic SSCM on the organisation performance in the Jordanian pharmaceutical sector?

4. LITERATURE REVIEW

4.1 Impact of Environmental SSCM on Organizational Performance

Environmentally Sustainable Supply Chain Management (SSCM) aims to reduce the ecological impact of a company's supply chain operations, which can substantially affect organizational performance. Research indicates that implementing environmentally sustainable practices such as waste minimization, resource optimization, and the utilization of eco-friendly materials can enhance internal processes by streamlining operations and lowering expenses (Zhu et al., 2022). Companies that implement green logistics and energy-efficient manufacturing processes frequently spend lower operational costs, minimize waste, and achieve greater resource efficiency, while immediately improving internal performance. Moreover, environmental SSCM can catalyze innovation by compelling corporations to create new technologies or processes that conform to sustainability objectives. This may result in the creation of novel products or services, fostering organizational growth and improving learning inside the company (Singh, 2024). Moreover, by implementing sustainable practices, firms cultivate a reputation for environmental stewardship, which can enhance service recipients' confidence and contentment, so increasing the company's market standing and long-term competitiveness (Muharman, 2024). Based on this discussion, this study formulized the following hypothesis.

H1: There is significant impact of the environmental SSCM on the organisational performance in the Jordanian pharmaceutical sector

4.2 Social SSCM and Its Impact on Organizational Performance

Social SSCM emphasizes the social and ethical dimensions of supply chain management, including labor practices, supplier relationships, community involvement, and corporate social responsibility (CSR). Studies demonstrate that the social aspect of SSCM significantly influences organizational performance, especially regarding creativity, learning, and service delivery. By incorporating social sustainability principles, firms guarantee ethical standards throughout their supply chains while also improving their corporate culture, promoting increased collaboration and knowledge-sharing (Zhu et al., 2022). Social SSCM promotes organizational engagement with stakeholders, including employees, suppliers, and local communities, fostering a more resilient and inventive workforce. Social SSCM enhances customer trust and satisfaction among service

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receivers by showcasing corporate accountability and ethical conduct, especially in sectors such as pharmaceuticals, where product integrity and ethical sourcing are vital for consumer confidence.

Consequently, firms that adopt social supply chain management are likely to foster stronger customer relationships, improve employee happiness, and promote brand loyalty, all of which contribute to greater organizational performance (Fernando et al., 2022).

H2: There is significant impact of the social SSCM on the organisational performance in the Jordanian pharmaceutical sector.

5.3 Economic SSCM and Its Role in Enhancing Organizational Performance

Economic SSCM focuses on enhancing the economic efficiency of supply chains via cost-effective resource management, strategic sourcing, and process optimization. The implementation of economic sustainability practices enables companies to minimize waste, optimize operational efficiency, and eventually decrease costs, while enhancing internal operations. By increasing supply chain efficiency and reducing wasteful spending, businesses that use economical SSCM techniques, like lean manufacturing or just-in-time inventory management, improve their financial performance (Duong, 2022).

These cost-reduction strategies also improve organizational learning, enabling organizations to devise innovative methods for optimizing their processes and adapting to market fluctuations more efficiently. In the pharmaceutical sector, economic supply chain management enables firms to maintain competitiveness by controlling costs in highly regulated contexts with narrow profit margins. Economic SSCM can enhance the service recipient's experience by increasing product availability and decreasing lead times, resulting in elevated customer satisfaction and loyalty (Le, 2023). This leads to an enhanced market presence and improved organizational effectiveness. Based on this discussion, this study formulized the following hypothesis.

H3: There is significant impact of the economic SSCM on the organisational performance in the Jordanian pharmaceutical sector

5. THEORETICAL FRAMEWORK

Based on the TBL approach of the recent study that conceptualizes SSCM management into three constructs (environmental SSCM, economic SSCM, social SSCM), these constructs examined as an independent variable in this study, while the dependent variable is organizational performance (Internal Processes, Learning and Innovation, Service Receiver). The proposed model is based on studies (Sarela, 2021; Carter and Rogers, 2008; Zilani et al., 2012; Harms et al., 2013). It will be examined empirically in the Jordanian context in pharmaceutical industry sector.

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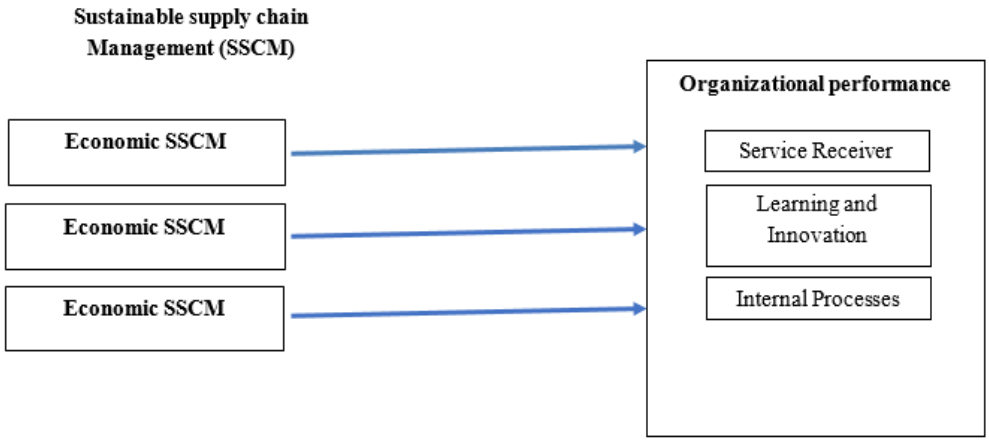

Figure 1: Theoretical Model of the Study (Adapted From the Studies of Sarela, 2021; Carter and Rogers, 2008; Zilani Et Al., 2012; Harms Et Al., 2013)

6. RESEARCH METHODOLOGY

6.1 Design and Procedures

Recent studies have used quantitative methods, with the hypotheses developed to examine the impact of impact of SSCM (environmental SSCM, social SSCM and economic SSCM) on the organisational performance (internal processes, learning and innovation, service receiver) in the Jordanian pharmaceutical sector. The data collection process conducted through 1691 pharmaceutical organizations in Amman consists of (factory, drug store, company, and pharmacy). The study used secondary data from previous research that examined the same issues. To achieve the goals of the study, SMART-PLS was the data analysis package used.

6.2 Population and Sample

According to the Jo-health website, which publishes pharmaceutical sector statistics in Jordan, the study population includes 15 pharmaceutical factories, 1,568 pharmacies, 95 drug stores, and 13 pharmaceutical companies, totaling 1,691 organizations in Amman, the capital. The study will focus on top managers from each of these organizations, as they are best positioned to provide insights on the impact of sustainable supply chain management on the organisational performance within the pharmaceutical sector. These managers were selected due to their expertise and familiarity with management principles that promote green innovation.

The stratified random sampling approach will be applied to choose the (313) based on the Krejcie and Morgan (1970) table from (1691) organizations in the pharmaceutical sector (factory, drug store, company, and pharmacy).

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Table 1: Stratified Random Sampling of the Study

No.	Governorate	Population	Sampling calculation	Sampling Size	No. of respondents in administrative positions
1	Pharmaceutical Factory	15	18.5% * 15	3	36
2	Pharmacies	1568	18.5% * 1568	290	870
3	Drug Stores	95	18.5% * 95	17	68
4	Pharmaceutical Companies	13	18.5% * 13	3	27
Total		1691		313	1001

The total number of organisations in the pharmaceutical sector is 1691, and according to Krejci and Morgan (1970), the sample size for this group is 313. The pharmaceutical industry organisations will get a randomly distributed percentage of the sample, which is 313/1691= 0.20, from each location.

6.3 Measurement

The sustainable supply chain management the independent variable of this study conceptualized based on the study of Sarela, (2021) as environmental SSCM, economic SSCM, social SSCM. The measurement of these three independent variables adapted from the studies of Schaltegger et al. (2016) and study of Narimissa et al. (2020). Moreover, organisational performance which is the dependent variable of this study measured by three sub-constructs; service receiver measured by items adapted from the study of Ezenyilimba et al. (2019), learning and innovation measured by items adapted from the study of Kareem et al. (2019), and finally, the internal process measured by items adapted from the study of Baah and Jin (2019).

7. DATA ANALYSIS

The data was analysed using SMART-PLS path modelling. We used the model to assess validity (discriminant validity and convergent validity) and reliability (internal consistency). In what follows, you will see all of the outcomes. Additionally, structural model analysis tested the study's assumptions by determining the causal impact between constructs. Structural equation modelling (SEM) is a two-stage method for analysing data and evaluating study models. It relies on path modelling. The first part of the process involved assessing the validity and reliability of the items used in the measurement model. The second part, known as the structural model, involved testing the significance of the path coefficients and determining the study model's R^2.

7.1 Measurement Model Evaluation

To ascertain the items' reliability and the constructs' internal consistency dependability, we examined the measurement model. The measuring methodology also produces convergent validity, discriminant validity, and content validity. Hair et al. (2014) demonstrated that all measurement models were reliable and valid to an acceptable degree. Figure 2 displays the study's measurement model.

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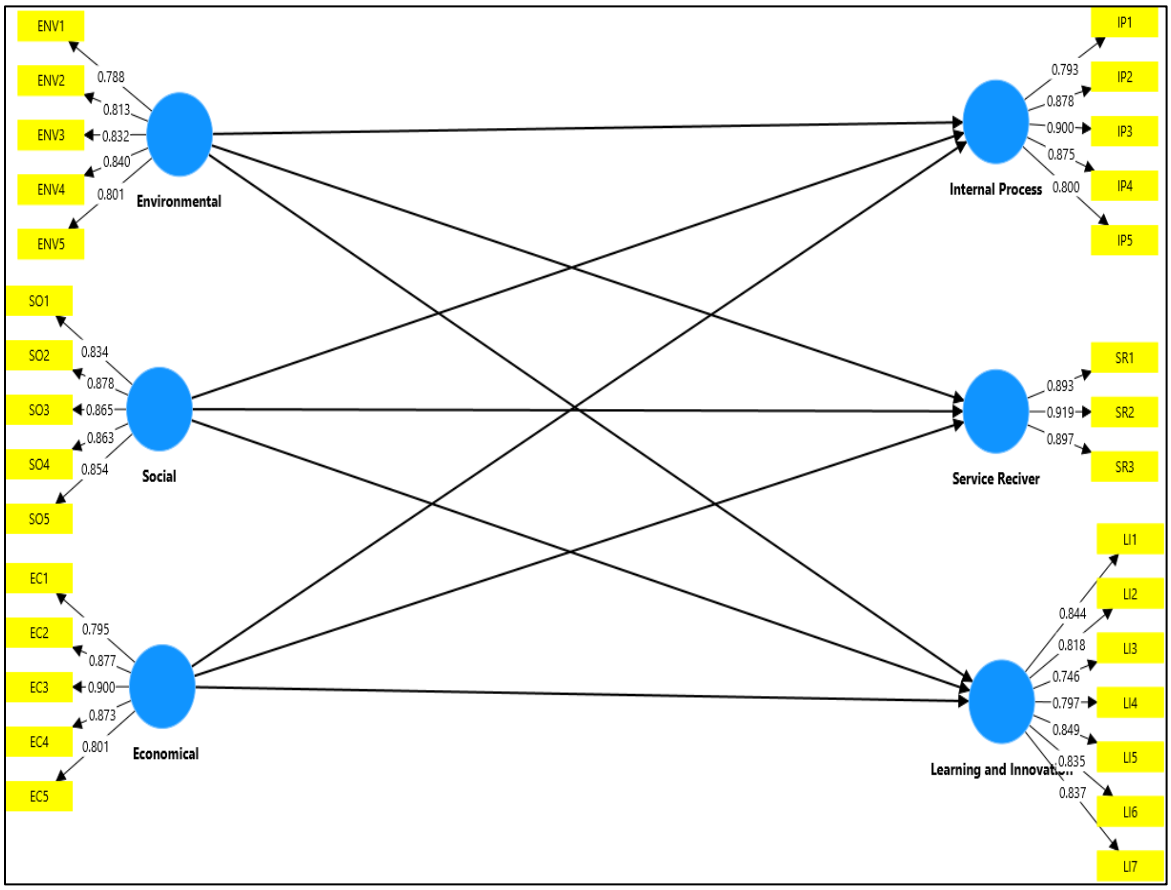

Figure 2: The Measurement Model of the Study

Figure 2 displays the items' outer loadings on the latent constructs; the results demonstrate that all items meet the level of 0.40 indicated by (Hair et al., 2014). Table 2 displays the results of the measurement model's evaluation of the scale's internal consistency and reliability using metrics such as Cronbach's alpha and composite reliability. These metrics are useful for quantifying the reliability and consistency of a scale, especially one with many components.

Table 2: Assessment for Measurement Model

		Indicators Reliability	Reliability	Validity	Reliability
Construct	**Items (Indicators)**	**loading >0.70**	**Compost reliability CR >0.70**	**Convergent validity AVE >0.50**	**Cronbach's Alpha >0.70**
Environmental SSCM	ENV1	0.788	0.908	0.664	0.874
	ENV2	0.813			
	ENV3	0.832			
	ENV4	0.840			
	ENV5	0.801			
Social SSCM	SO1	0.834	0.934	0.738	0.911
	SO2	0.878			

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	SO3	0.865			
	SO4	0.863			
	SO5	0.854			
Economic SSCM	EC1	0.795	0.929	0.723	0.903
	EC2	0.877			
	EC3	0.900			
	EC4	0.873			
	EC5	0.801			
Learning and Innovation	LI1	0.844	0.934	0.670	0.918
	LI2	0.818			
	LI3	0.746			
	LI4	0.797			
	LI5	0.849			
	LI6	0.835			
	LI7	0.837			
Internal Process	IP1	0.793	0.929	0.723	0.903
	IP2	0.878			
	IP3	0.900			
	IP4	0.875			
	IP5	0.800			
Service Receiver	SR1	0.893	0.930	0.816	0.887
	SR2	0.919			
	SR3	0.897			

The results of the reliability analysis (CR) demonstrate that all of the constructs have excellent internal consistency, as shown in Table 2. This is in accordance with Hair et al. (2014), who established an acceptable level of 0.70 for composite reliability. In addition, according to Hair et al. (2014), the average variance extracted (AVE) should be greater than 0.5 in order for the study to be deemed adequate in terms of convergent validity. All of the study's constructs demonstrate satisfactory convergent validity according to the Average Variance Extracted (AVE) coefficients in Table 2.

In addition to dependability, Table 3 shows that the study's constructs were discriminantly valid. This means that, according to empirical norms, the measurement model did not include any duplicate items in any of the constructs. We assessed the discriminant validity of SMART-PLS using the Fornell and Larcker method. The discriminating validity evaluation confirmed the validity of the study's measurements. The Fornell-Larcker technique uses Table 3 to test the discriminant validity of the measurement model.

Table 3: Fornell-Larcker Approach

	Economical	**Environmental**	**Internal Process**	**Learning and Innovation**	**Service Receiver**	**Social**
Economical	0.850					
Environmental	0.412	0.815				
Internal Process	0.312	0.412	0.850			
Learning and Innovation	0.615	0.583	0.614	0.819		
Service Receiver	0.736	0.451	0.735	0.633	0.903	
Social	0.399	0.678	0.399	0.518	0.507	0.859

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Discriminate validity is established when the computed AVE square root surpasses the correlation between the components accounting for each pair, according to the research of Fornell and Bookstein (1982). This information is highlighted in table 3. This correlation matrix need to have a value that surpasses all other entries in rows and columns that are not on the diagonal. It is clear from these findings that the criteria for the measures' discriminatory power have been met.

7.2 Structural Model Findings

The evaluation of structural parameters does not take into account the value and relevance of the estimates, which are shown as one-headed arrows in the path diagrams. By checking the predicted connections between the specified and evaluated variables, this evaluation verifies the accuracy of the structural model. We used Partial Least Squares Structural Equation Modelling, or PLS-SEM, in this work. Additionally, testing the structural model and hypotheses using bootstrapping with 5000 replicates. This research used p-value and inner model R^2 tests (Hair et al., 2014). See the model's inner workings, including the beta coefficient of construct correlations and p-value, in Figure 3.

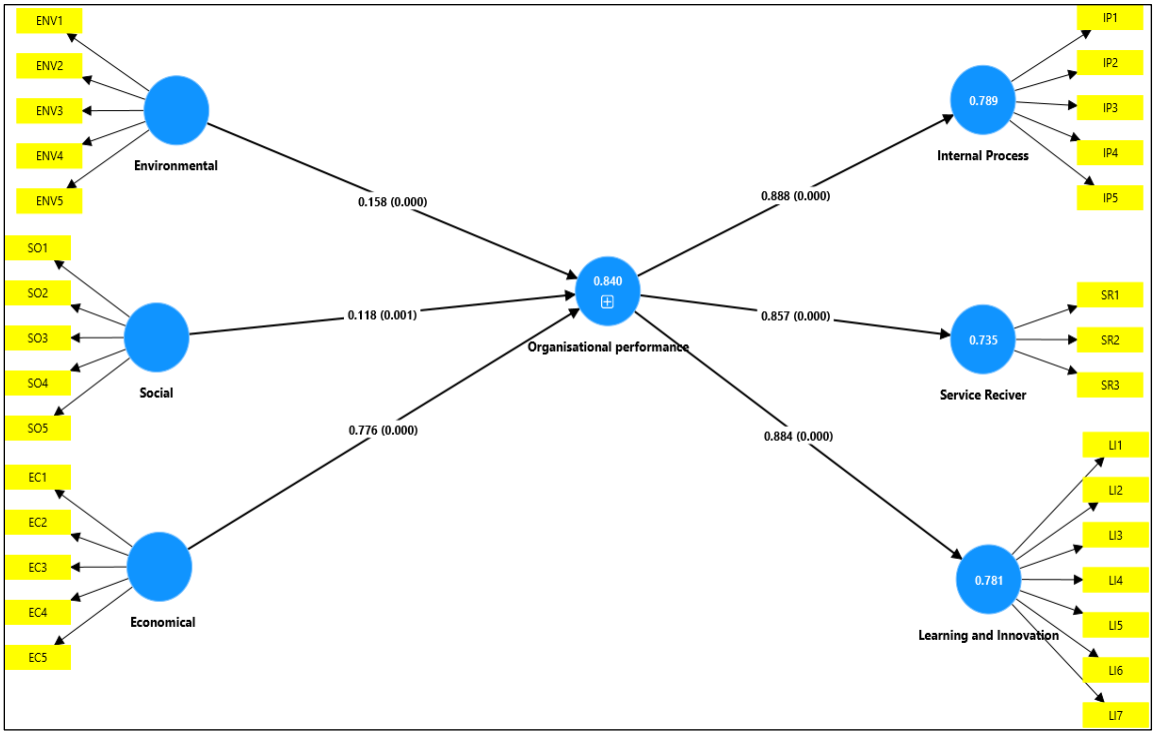

Figure3: The Structural Model Path Coefficient and P Value of the Study

Table 4 and Figure 2 display the findings of the coefficient determination R2 for each endogenous variable in the study. All of these variables showed an exceptional value.

Table 4: R^2 of the Endogenous Variables

Variables Relation	R^2	R^2 Adjusted
Organisational performance	0.840	0.839

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As shown above in table 4 the environmental SSCM, economic SSCM and social SSCM explain 84% of the variation of organisational performance in the pharmaceutical sector in Jordan. The blindfolding process is used to test the model's predictive relevance. In the reflective measurement model of the endogenous construct, the blindfolding operation is a resampling strategy that predicts and systematically deletes every data point of the indicators. According to Hair Jr et al. (2016), endogenous constructions with reflected measurements are the only ones that should be subjected to the blindfolding process.

It is presumed that the model has predictive validity for a specific endogenous construct if the $Q2$ values are more than zero (Cohen, 1988; Hair Jr et al., 2016). The endogenous construct's $Q2$ results are shown in Table 4.15.

Table 5: Predictive Relevance of the Endogenous Latent Variables

Exogenous Constructs	Q^2 predict	Results
Organisational performance	0.668	$Q^2 > 0$ The variable explaining gives predictive relevance.

As shown in Table5, the values of Organisational performance of 0.668 which is greater than 0, indicating that the model's predictive significance is adequate.

7.3 Hypotheses Testing (Path Coefficient)

This section delves into the results of the route coefficient that were utilised to test the study's hypotheses. Figure 3 and table 6 display the results of the direct tests (H1 to H3). The p-value is denoted by the numbers in brackets, while the beta value is represented by the values adjacent to the brackets.

Table 6: Structural Model Assessment for the Direct Effect Hypotheses

		Path coefficient Beta	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
H2	Environmental -> Organisational performance	0.158	0.037	4.301	0.000	Supported
H3	Social -> Organisational performance	0.118	0.036	3.308	0.001	Supported
H1	Economical -> Organisational performance	0.776	0.023	33.090	0.000	Supported

Notes: Significant level at ** = $p < 0.05$,

Hypothesis H1, which was developed to investigate the influence of ambient SSCM on organisational performance, was backed by the results of the direct effect hypotheses (P=0.000<0.05, B=0.158), as shown in Table 6. A total of three hypotheses were tested and found to be true: hypothesis H1, which aimed to determine how environmental SSCM affected organisational performance (P=0.000<0.05, B=0.158), hypothesis H2, which sought to determine how social SSCM affected organisational performance (P=0.001<0.05, B=0.118), and hypothesis H3, which sought to determine how economic SSCM affected organisational performance (P=0.000<0.05, B=0.776). in Jordan's pharmaceutical industry.

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8. DISCUSSION AND CONCLUSION

The results of this study correspond with prior research, including the works of Adegoke et al. (2020) and Zimon et al. (2022), which validate the substantial direct influence of environmental SSCM on organizational performance. These studies highlight the significance of environmental SSCM in boosting overall performance. The substantial influence of social SSCM on organizational performance, as emphasized by Alghababsheh and Gallear (2021) and Alam (2022), aligns with the findings of the current study. Social SSCM, emphasizing ethical practices, employee welfare, and community engagement, positively impacts firm reputation, employee satisfaction, and consumer trust, hence enhancing performance outcomes. The research conducted by Yang and Wang (2023) substantiates the substantial influence of economic SSCM on organizational performance, highlighting that cost-effective methods, resource optimization, and efficient supply chain management can improve profitability and competitiveness.

The findings are explicable within the framework of the Jordanian pharmaceutical sector, where entities encounter increasing pressure to align their operations with global sustainability trends while maintaining competitiveness in a hard market. Pharmaceutical firms in Jordan are progressively acknowledging the significance of environmental sustainability, especially regarding waste reduction, energy conservation, and minimizing environmental effect, which can result in operational efficiency and cost reductions. The significance of social SSCM is especially pertinent in the Jordanian environment, as enterprises seek to conform to ethical standards, comply with international legislation, and cultivate beneficial connections with local communities and stakeholders. The pharmaceutical industry in Jordan gains from economic supply chain management strategies, as cost efficiency and resource optimization are essential for sustaining competitiveness in a sector characterized by narrow profit margins due to regulatory expenses and pricing pressures. The incorporation of environmental, social, and economic aspects of SSCM can markedly improve organizational performance in the Jordanian pharmaceutical sector by optimizing operational processes, promoting innovation, and strengthening customer and stakeholder connections.

9. LIMITATIONS AND FUTURE RESEARCH

This investigation used a survey technique to gather data. Furthermore, the research only captured the participants' perspectives at one point because it was cross-sectional. Future studies should consider using longitudinal research approaches to more accurately demonstrate cause-and-effect relationships. Another limitation is the study's approach. More specifically, we exclusively evaluated the impact of the studied elements using quantitative methods. Instead of limiting them to quantitative characteristics, future research on SSCM and organisational success should go more into the "depth" of the topic. The qualitative method can yield new insights and a deeper comprehension of the topic at hand. Combining qualitative and quantitative methods enhances the overall results. Effects of environmental, economic, and social SSCM on the pharmaceutical

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industry's internal processes, learning and innovation, and service receiver performance in Jordan Jordan's pharmaceutical industry tested the research approach, focussing on the senior management of pharmaceutical companies in the country. Researchers can compare the study's findings to those from other fields or businesses by testing the study's model in manufacturing or service provision. We can also test the model in different settings, with different cultures or nations.

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