



ADVANCE SOCIAL SCIENCE ARCHIVE JOURNAL

Available Online: <https://assajournal.com>

Vol. 05 No. 01. Jan-March 2026. Page# 8337-8342

Print ISSN: [3006-2497](#) Online ISSN: [3006-2500](#)Platform & Workflow by: [Open Journal Systems](#)<https://doi.org/10.5281/zenodo.23439268>**From Visibility to Performance: The Roles of Supply Chain Capabilities, Traceability, and Resilience****Mr. Qasim Ali**qasim2.res.iiem@pu.edu.pk**Dr. Atif Hussain**atif.iqtm@pu.edu.pk**ABSTRACT**

Objective: This study examines the relationships among supply chain visibility, capabilities, traceability, resilience, supply chain performance, and firm performance in the textile sector.

Method: Data were collected through a structured online questionnaire from 79 supply-chain professionals. Partial least squares structural equation modelling (PLS-SEM) was used to evaluate the measurement and structural models, including reported indirect effects.

Results: Supply chain visibility was positively associated with capabilities ($\beta = 0.713$) and traceability ($\beta = 0.433$). Capabilities positively predicted traceability ($\beta = 0.470$) and resilience ($\beta = 0.330$), while traceability positively predicted resilience ($\beta = 0.487$). Resilience was positively associated with supply chain performance ($\beta = 0.480$), which strongly predicted firm performance ($\beta = 0.750$). The direct effects of capabilities and traceability on supply chain performance were not statistically significant.

Conclusions: The findings suggest that visibility, capabilities, traceability, and resilience represent interconnected elements of supply-chain management. The results highlight the potential importance of resilience and operational execution in translating organizational resources into performance outcomes. However, the reported results require verification against the original statistical output before definitive mediation or causal conclusions can be drawn.

Keywords: Firm performance; supply chain visibility; supply chain capabilities; traceability; resilience; supply chain performance; textile manufacturing.

1. Introduction

Supply chains connect suppliers, manufacturers, logistics providers, and customers through complex networks that are increasingly exposed to demand uncertainty, operational interruptions, and external disruptions. These challenges have strengthened interest in supply chain resilience, which concerns the ability of supply chains to prepare for disruptions, respond effectively, and recover while maintaining operations (Christopher & Peck, 2004; Jüttner & Maklan, 2011). In the textile sector, where production schedules, raw-material availability, and delivery commitments are closely connected, effective supply-chain coordination can be particularly important.

Supply chain visibility refers to the availability of relevant information about activities, materials, inventory, and orders across supply-chain networks. Barratt and Oke (2007) identify organizational resources and information systems as important foundations of visibility, while Caridi et al. (2010) examine its implications for supply-chain management. Traceability is related but distinct: it concerns the ability to follow products, materials, and associated information through successive stages of a supply chain. Traceability can help organizations identify problems, establish accountability, and locate affected products or processes (Kelepouris et al., 2007; Razak et al., 2023).

Supply chain capabilities refer to the organizational resources and routines that support coordination, information exchange, adaptation, and operational execution. The resource-based view suggests that organizational resources can contribute to competitive advantage when they are valuable and effectively deployed (Barney, 1991). Dynamic capabilities theory further emphasizes the ability to integrate and reconfigure resources as conditions change (Teece et al., 1997). In supply-chain settings, these perspectives imply that information and technology may be more useful when supported by coordination routines and adaptive processes.

Resilience is one potential mechanism through which supply-chain capabilities can be translated into operational performance. Christopher and Peck (2004) emphasize the importance of developing resilient supply chains, while Wieland and Wallenburg (2013) identify relational competencies as relevant to resilience. Traceability may support this process by improving information about material movements and disruption locations. A systematic review by Razak et al. (2023) highlights the potential relationship between traceability and resilience, including the roles of visibility, flexibility, velocity, and collaboration. The relationship between these constructs and performance is not necessarily straightforward. Supply chain performance concerns operational outcomes such as reliability, responsiveness, and efficiency, whereas firm performance reflects broader organizational outcomes. Huang et al. (2023), studying Vietnamese garment manufacturers, found that the relationships among capabilities, visibility, resilience, and performance involved indirect pathways. Riaz et al. (2024) similarly investigated the mediating roles of traceability, visibility, and resilience in the relationship between Industry 4.0 adoption and supply chain performance. These findings suggest that the mechanisms connecting supply-chain resources to performance warrant further examination.

The present study addresses this issue by examining the interconnected relationships among visibility, capabilities, traceability, resilience, supply chain performance, and firm performance in the textile sector. Its central question is whether these constructs are associated with performance directly or through intermediate operational mechanisms.

1.1. The current study

Drawing on the resource-based view and dynamic capabilities theory, this study proposes that visibility and capabilities are associated with stronger traceability and resilience, that resilience supports supply chain performance, and that supply chain performance is positively associated with firm performance. The following hypotheses reflect the direct paths reported in the supplied project:

H1: Supply chain visibility positively influences supply chain capabilities.

H2: Supply chain visibility positively influences supply chain traceability.

H3: Supply chain capabilities positively influence supply chain traceability.

- H4: Supply chain capabilities positively influence supply chain resilience.
- H5: Supply chain traceability positively influences supply chain resilience.
- H6: Supply chain resilience positively influences supply chain performance.
- H7: Supply chain capabilities positively influence supply chain performance.
- H8: Supply chain traceability positively influences supply chain performance.
- H9: Supply chain performance positively influences firm performance.

2. Methods

2.1. Data and participants

A quantitative, cross-sectional survey design was used. The target population consisted of professionals involved in textile-sector supply-chain activities, including procurement, logistics, operations, and supply-chain management. Purposive sampling was employed to reach respondents with relevant knowledge of their organizations' operations. The supplied project reports 79 valid responses, collected through an online questionnaire.

The cross-sectional design permits examination of relationships among the measured constructs but does not establish temporal ordering or causality. Detailed participant characteristics and the distribution of respondents across organizations were not fully available in the material reviewed.

2.2. Measures

The questionnaire used measures described in the original project as adapted from previous research. The constructs were supply chain visibility, supply chain capabilities, supply chain traceability, supply chain resilience, supply chain performance, and firm performance. The source project reports the use of reliability and convergent-validity indicators. The exact questionnaire items and their individual source references should be verified before publication.

2.3. Data analysis

PLS-SEM was used to evaluate the measurement and structural models. The reported measurement assessment included Cronbach's alpha, composite reliability, rho_A, and average variance extracted (AVE). Structural paths were evaluated using estimated coefficients, bootstrapped t-statistics, and confidence intervals. Indirect effects were also reported. These procedures are consistent with established approaches to measurement and structural-model evaluation (Fornell & Larcker, 1981; Hair et al., 2022).

3. Results

3.1. Measurement model

The source project reports that Cronbach's alpha, composite reliability, and rho_A exceeded 0.70 across the constructs. Reported AVE values ranged from 0.557 to 0.710, exceeding the conventional 0.50 threshold. These results support internal consistency and convergent validity, subject to verification of the underlying output. Discriminant validity should also be documented, including the HTMT criterion where appropriate (Henseler et al., 2015).

3.2. Structural relationships

Table 1 presents the path coefficients reported in the original project.

Table 1. Structural model results

Relationship	β	t	95% CI	Outcome
Visibility → Capabilities	0.713	10.346	[0.564, 0.832]	Supported
Visibility → Traceability	0.433	4.133	[0.226, 0.633]	Supported
Capabilities → Traceability	0.470	4.204	[0.245, 0.686]	Supported
Capabilities → Resilience	0.330	3.482	[0.141, 0.516]	Supported
Capabilities → Supply chain performance	0.120	1.002	[-0.131, 0.346]	Not supported
Traceability → Resilience	0.487	4.593	[0.264, 0.677]	Supported
Traceability → Supply chain performance	0.201	1.252	[-0.125, 0.511]	Not supported
Resilience → Supply chain performance	0.480	3.807	[0.264, 0.762]	Supported
Supply chain performance → Firm performance	0.750	11.895	[0.611, 0.857]	Supported

Note. Estimates are reproduced from the supplied project and have not been independently recalculated.

Visibility was positively associated with capabilities and traceability. Capabilities were positively associated with traceability and resilience, while traceability was positively associated with resilience. Resilience significantly predicted supply chain performance, and supply chain performance was strongly associated with firm performance.

By contrast, the direct paths from capabilities and traceability to supply chain performance were not statistically significant because their reported confidence intervals included zero. These findings indicate that the direct performance benefits of capabilities and traceability were not established in this model.

3.3. Reported indirect effects

The source project also reports the indirect effects shown in Table 2.

Table 2. Indirect-effect estimates reported in the project

Indirect pathway	β	95% CI
Visibility → Capabilities → Traceability	0.335	[0.183, 0.561]
Capabilities → Traceability → Resilience	0.229	[0.123, 0.381]
Traceability → Resilience → Supply chain performance	0.234	[0.127, 0.383]
Capabilities → Resilience → Supply chain performance	0.158	[0.073, 0.297]
Resilience → Supply chain performance → Firm performance	0.360	[0.215, 0.573]

Note. These are the indirect effects reported in the original project. The exact pathways and mediation classifications require checking against the original PLS-SEM output.

All reported confidence intervals exclude zero. However, because some pathway labels and the direct-path table do not clearly align, these values should be treated as provisional until the specific indirect effects are verified.

4. Discussion

This study examined the relationships among supply-chain visibility, capabilities, traceability, resilience, supply chain performance, and firm performance in the textile sector. The reported results suggest that the constructs are interconnected, with resilience and supply-chain execution potentially providing important links between organizational resources and broader performance outcomes.

The positive relationship between visibility and capabilities is consistent with the argument that information availability supports coordination and operational decision-making. Visibility can help firms monitor orders, inventory, and supplier activities, although its usefulness depends on how effectively information is incorporated into operational routines (Barratt & Oke, 2007; Caridi et al., 2010). The positive relationship between visibility and traceability also suggests that information access and product tracking may complement each other in supply-chain management.

The positive relationships between capabilities, traceability, and resilience are consistent with the view that organizations need both information and the capacity to respond to disruptions. Traceability may help firms identify affected materials or orders, while capabilities can support coordination and corrective action. This interpretation aligns with the traceability review by Razak et al. (2023) and research on digital technologies and supply-chain resilience (Riaz et al., 2024).

An important finding is that capabilities and traceability did not significantly predict supply chain performance directly. One possible interpretation is that resources and information systems do not automatically improve operational outcomes unless firms use them to improve disruption response, coordination, and recovery. This is consistent with dynamic capabilities theory, which emphasizes the deployment and reconfiguration of resources rather than their mere possession (Teece et al., 1997).

The positive association between resilience and supply chain performance supports the view that organizations better equipped to respond to disruptions may maintain more reliable operations. The strong relationship between supply chain performance and firm performance further suggests that operational effectiveness is closely linked to broader organizational outcomes. Similar questions about direct and indirect performance effects have been investigated in garment manufacturing by Huang et al. (2023). Nevertheless, the present study's cross-sectional design does not establish causality.

4.1. Implications and limitations

The findings suggest that textile-sector managers should connect visibility and traceability systems to practical response procedures. Investments in information systems are likely to be more useful when accompanied by clear communication, supplier coordination, contingency planning, and flexible operating arrangements.

The study is limited by its sample of 79 respondents, purposive sampling, and cross-sectional design. The reported indirect effects and some model labels also require verification. Future research could use larger samples, multiple textile clusters, longitudinal data, and objective operational measures to test whether the proposed relationships persist over time.

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