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IMPACT OF FINTECH ON OPERATIONAL EFFICIENCY IN JORDAN'S INDUSTRIAL SECTOR: THE MEDIATE ROLE OF SUPPLY CHAIN RESILIENCE

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Abstract: This research paper examines the effect of financial technology (Fintech) on operational efficiency in Jordan's industrial firms, with a focus on whether supply chain resilience moderates this relationship. Partial least squares and structural equation modeling were employed, using survey data collected from 150 operations and supply chain managers in twenty industrial firms. The survey assessed Fintech sophistication, supply chain resilience, operational efficiency, lead-time reduction, resource utilization, and cost efficiency. The findings reveal that digitalization of transactions and payments significantly improves both operational efficiency and supply chain resilience. The firms studied demonstrated robust resilience through flexible sourcing, agile logistics networks, and proactive risk management, achieving greater process savings from their Fintech investments. These results highlight the importance of integrating Fintech rollout with supply chain resilience strategies to enhance agility, sustain operations under external shocks, and improve performance outcomes. Practically, managers can strengthen digital capabilities and leverage industry-wide digital transformation initiatives to build more resilient supply chain practices.

Keywords: Digital Payments, Digital Transactions, Financial Technolgy, Operational Efficiency, Supply Chain Resilience

1. Introduction

Financial technology (Fintech) applications such as mobile payment platforms, blockchain technologies, real-time financial analytics, and online financing tools have transformed business practices across industries in recent years. Fintech also promotes transparency by automating transactions, enabling data flow, and digitally generating accessible financial statements that support operational transactions downstream in the supply chain (Gunaedi et al., 2024; Jawabreh et al., 2023). These features underscore the need to strengthen industry reliance (Adiputra, 2024). Real-time synchronization of financial knowledge with operational statistics further improves inventory control, procurement cycles, and supply chain processes (Ahmed & MacCarthy, 2023; Huynh, 2022). Blockchain's smart contracts eliminate administrative delays and disputes, as predictive and resource planning tools are guided by artificial intelligence-driven financial analysis (Allahham et al., 2024). This integration enhances production efficiency, resulting in faster delivery, fewer errors, and more stable processes. However, the extent to which firms realize value from Fintech investments depends largely on supply chain resilience—the capacity to anticipate, withstand, contain, and recover from disruptions while preserving baseline operations (Amini & Javid, 2023).

Implications for practice: Organizations with adaptable sourcing, agile logistical networks, and portfolio risk management can sustain productivity during market turbulence or shocks (Dhore et al., 2024). The role of Fintech in resilient supply chains is to optimize operations and extend their durability. While extensive international research has examined the link between digital transformation and operational performance, limited work has explored the relationship between Fintech adoption, supply chain resilience, and operational outcomes in emerging economies (Tashtemirovich et al., 2024). In Jordan's industrial sector, persistent demand volatility, supply chain disruptions, and rising operational costs highlight the need to integrate digital finance skills with supply chain resilience. This study addresses that gap with the following two research questions:

RQ1: What are the implications of fintech adoption for operational efficiency in the industrial sector?

RQ2: How does the strength of supply chain resilience influence the relationship between Fintech and operational efficiency?

The remainder of this research paper is structured as follows: Section 2 reviews the literature and develops the hypotheses. Section 3 presents the method, data collection, and procedures. Section 4 reports the empirical results and discussion. Section 5 concludes and provides theoretical and managerial implications.

2. Literature Rerview and Hypothesis Development

The relationship between Fintech and operational efficiency, particularly in the banking sector, has been extensively examined. Most studies report positive effects of Fintech on various dimensions of bank performance and efficiency (Chen et al., 2021; Khan et al., 2024; Lee et al., 2023). For example, Ally et al. (2025) investigated the relationship between Fintech and efficiency in Tanzanian commercial banks from 2010 to 2021 and found that Fintech significantly improved efficiency across all banks. These findings confirm Fintech's contribution to enhancing operational efficiency and service delivery. In this section, we examine the relationship between Fintech and operational efficiency from multiple perspectives, using supply chain resilience as a moderator of this relationship. We also develop the research hypotheses tested in this study, which distinguishes it by focusing on Jordanian companies.

2.1 Fintech Adoption and Operational Efficiency

Integrating Fintech into business operations embeds financial processes into daily planning, making transactions and decision-making more convenient. Digital transfers, digital payments, and blockchain-supported smart contracts represent key fintech products (Daoud et al., 2024). These instruments reduce transaction and cash management costs, improve cash-flow management, and accelerate the completion of financial transactions (Deb, 2024). Payments can be made electronically between businesses, suppliers, and customers in real time, reducing lead times for procurement and order fulfillment (Dengra, 2024). In addition, secure, prompt, and transparent settlement systems facilitate supply chain coordination and cost reduction (Almestarihi et al., 2024). Blockchain-based smart contracts eliminate the need for human intervention and third parties, thereby increasing the feasibility, speed, and trust of supply chain finance partnerships (Bell et al., 2017; Hameed et al., 2024). Collectively, these Fintech applications enhance operational efficiency through shorter cycle times, improved resource use, and greater reliability. From this framework, the following

direct path is predicted: digital transactions and operational efficiency. The underlying hypothesis is stated as follows:
H1: *Digital transactions have a positive relationship with operational efficiency.*
H2: *Digital payments positively affect the operational efficiency of businesses.*
H3: *Smart contracts have a positive relationship with operational efficiency.*

2.2 Fintech Adoption & Supply Chain Resilience

Supply chain resilience is the capability of an organization to predict, prevent, absorb, adapt to, and quickly recover from disruptions (Bilal et al., 2024). Fintech adoption can strengthen resilience by providing greater financial flexibility, real-time visibility, and faster responsiveness to shocks (Browder et al., 2023). This enables instantaneous digital settlements that maintain supply chain liquidity even during crises. Digital payment channels also offer diverse alternatives for fund transfers, reducing excessive reliance on the banking system, which is vulnerable to disruptions (Cheng et al., 2024; Kassa et al., 2023). Contract automation ensures the execution of supply obligations even in worst-case scenarios (Chittipaka et al., 2023), making contracts non-repudiable. Thus, Fintech tools are regarded as enhancing long-term supply chain resilience. Accordingly, the following hypotheses are proposed:
H4: *Digital transactions positively and significantly affect supply chain resilience in the industrial sector.*
H5: *Digital payments positively and significantly affect supply chain resilience in the industrial sector.*
H6: *Smart contracts positively and significantly affect supply chain resilience in the industrial sector.*

2.3 Operational Efficiency and Supply Chain Resilience

A resilient supply chain enables organizations to maintain productivity, manage resources, and minimize downtime during disruptions (Daoud et al., 2024). Flexibility, redundancy, and agility built into operations allow firms to respond more quickly and effectively to fluctuations in demand, supply interruptions, or logistical challenges (Deb 2022). Greater resilience not only ensures continuity but also enhances efficiency by reducing delays, shortages, and cost overruns (Dengra, 2024). Therefore, the following hypothesis is proposed:
H7: *Supply chain resilience positively and significantly affects operational efficiency in the industrial sector.*

3. Research Method and Data Collection Process

3.1 Materials

The questionnaire constructs were adapted from existing scales in the Fintech, operational performance, and supply chain resilience literature. Fintech adoption was measured across three dimensions: digital payment and transaction systems (5 items) (Ali et al., 2024), blockchain and smart contract applications (5 items) (Bae, 2012), and AI-based financial analytics (4 items) (Banerjee & Roy, 2024). Operational efficiency was assessed using a 6-item scale covering lead-time reduction, cost efficiency, resource utilization, and process reliability (Daoud et al., 2024). Supply chain resilience was measured with a 6-item scale reflecting flexibility, redundancy, agility, and risk management ability (Bell et al., 2017). All items were rated on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

3.2 Sample and Data Collection

A convenience sample was drawn from registered industrial firms in Jordan (Bilal et al., 2024). The survey targeted operations managers, supply chain managers, and finance officers with at least two years of professional experience. Data were collected through an online questionnaire between March 2024 and May 2025, with two follow-up reminders to increase the response rate. Of the 200 questionnaires distributed, 150 valid responses were obtained, yielding a 75% response rate. All participants were informed of the study's objectives, scope, and expected contributions. Confidentiality and anonymity were guaranteed, and participation was voluntary.

3.3 Measurement Procedures

Prior to implementation, the instrument was pilot-tested with 20 professionals from the industrial sector to establish face validity and content reliability. All constructs yielded Cronbach's alpha values above 0.80 (Bilal et al., 2024). The measurement model was assessed using SmartPLS 4.0. Factor loadings exceeded the 0.70 threshold; composite reliability and average variance extracted (AVE) exceeded 0.70 and 0.50, respectively. Discriminant validity was evaluated using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT), with values below 0.85 for each (Browder et al., 2024). Partial least squares structural equation modeling (PLS-SEM) analyses were conducted using SmartPLS 3.0. The measurement model was evaluated first, followed by tests for multicollinearity (VIF < 5), significance of path coefficients through bootstrap resampling (5,000 subsamples), and model fit using R^2 and predictive relevance (Q^2) (Cheng et al., 2024). The product indicator approach was applied to analyze the moderating effect of sustainability practices in SmartPLS (Chittipaka et al., 2023). Path significance was evaluated at $p < 0.05$.

3.4 Survey Instrument

The measurement items were adopted from established scales of Fintech adoption, supply chain resilience, and operational efficiency. Fintech adoption was measured across three dimensions: digital transactions, digital payments, and blockchain-enabled smart contracts. Supply chain resilience was assessed using six items measuring flexibility, redundancy, agility, and risk management. Operational efficiency was measured with six items reflecting lead-time reduction, cost efficiency, resource utilization, and process reliability. All items were rated on a five-point Likert scale. Based on respondent remarks and feedback from the researchers' institutions, minor wording adjustments were made to improve clarity and ensure accurate responses. Data were processed and coded in Microsoft Excel, then imported into SmartPLS 4 for PLS-SEM, which is suitable for complex models [31]. We analyzed the measurement model—evaluating indicator reliability, internal consistency, and convergent and discriminant validity—and the structural model to test the direct effects of digital transactions, digital payments, and smart contracts on operational efficiency, as well as the moderating effect of supply chain resilience. Collinearity was assessed using variance inflation factors (VIF < 5). Path coefficients and confidence intervals were considered significant at $p < .05$, established through bootstrapping with 5,000 subsamples at 95% confidence. Model fit was indicated by the coefficient of determination (R^2).

4. Data Analysis and Results

4.1. Demographic Profile

After removing seven responses that did not meet the criteria, a total of 150 respondents were retained. Regarding age distribution, 42% were between 30 and 39, 35% were in their 40s, and the remainder were split between those under 30 and over 50. Men constituted 55% of the sample and women 45%. By company size, 40% of respondents worked in large firms with more than 200 employees, 35% in mid-sized firms with 100–

200 employees, and 25% in small firms with fewer than 100 staff. In terms of professional experience, 60% reported more than five years of industry expertise.

4.2 Measurement Model Results

The measurement model evaluation showed that all indicator loadings exceeded the 0.70 cutoff, indicating good item reliability. Composite reliability values ranged from 0.82 to 0.91, reflecting strong internal consistency across constructs. All constructs achieved AVE values above 0.50, confirming convergent validity. Discriminant validity was established using the Fornell–Larcker criterion and the HTMT, both within acceptable thresholds. Digital transactions had a positive and statistically significant effect on operational efficiency ($\beta = 0.32$, $p < .05$), as illustrated in the structural model (see Figure 1). Digital payments and smart contracts also showed positive relationships with operational efficiency, while supply chain resilience strengthened these relationships, supporting its moderating role. The model demonstrated satisfactory explanatory power, as indicated by R^2 values showing that a significant portion of the variance in operational efficiency is explained by Fintech adoption and supply chain resilience.

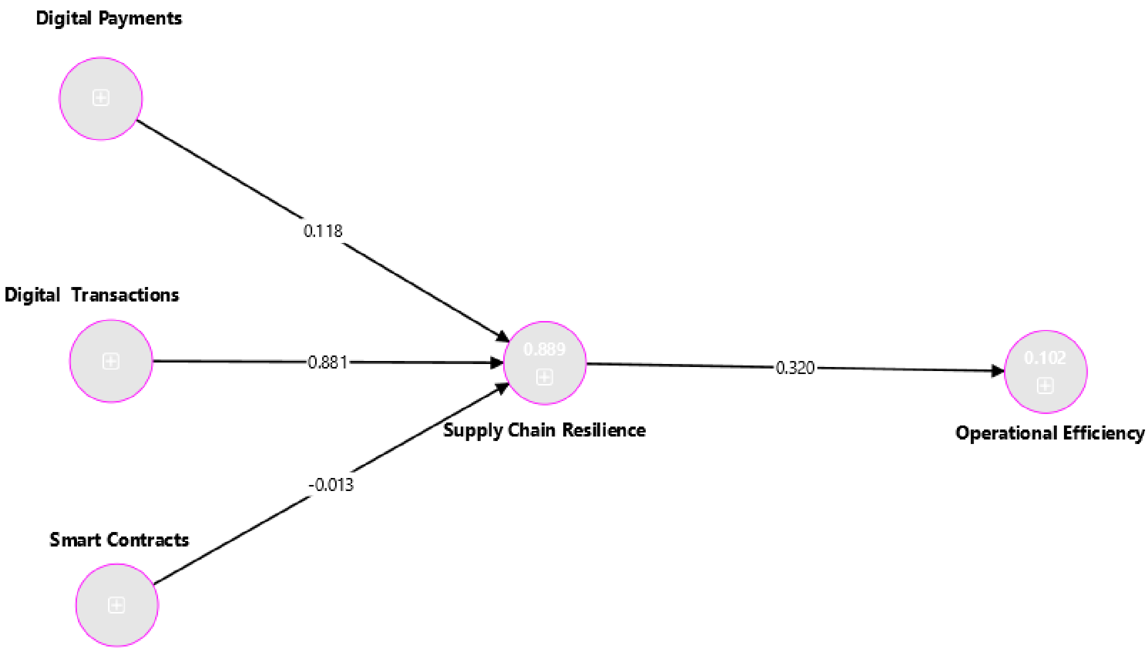

Figure 1. Structural model

Data for this study were collected through electronic and paper-based questionnaires distributed to operations managers, supply chain managers, and finance officers in industrial firms in Jordan. The questionnaire included closed-ended constructs adopted from established scales of Fintech adoption, supply chain resilience, and operational efficiency. Reliability and validity of the measurement model were assessed: Cronbach's alpha and composite reliability exceeded the recommended threshold of 0.70, and indicator loadings were above 0.70. Convergent validity was confirmed by AVE values greater than 0.50, while discriminant validity was established through the Fornell–Larcker criterion and HTMT ratio, both below 0.85. Fintech was operationalized across three dimensions: digital transactions, digital payments, and smart contracts. Supply chain resilience was measured through flexibility, redundancy, agility, and risk management, while operational efficiency was evaluated in terms of lead-time reduction, cost efficiency, resource utilization, and process reliability. Once the measurement model was confirmed, the structural model was tested using bootstrapping with 5,000 subsamples to calculate path coefficients and t-values. Direct effects of each Fintech dimension and supply chain resilience on operational efficiency were examined, along with the moderating role of supply chain resilience, tested using the product indicator approach.

Table 1. Cross-Loading Analysis

Constructs	Items	Factor loadings	Cronbach's Alpha	CR	AVE
Digital Payments	DP1	0.822	0.816	0.879	0.645
	DP2	0.741			
	DP3	0.823			
	DP4	0.822			
Digital Transactions	DT1	0.817	0.898	0.925	0.711
	DT2	0.852			
	DT3	0.851			
	DT4	0.823			
	DT5	0.872			
Operational Efficiency	PE1	0.856	0.915	0.935	0.741
	PE2	0.853			
	PE3	0.869			
	PE4	0.807			
	PE1	0.916			
Smart Contracts	SC1	0.795	0.872	0.912	0.723
	SC2	0.885			
	SC3	0.856			
	SC4	0.863			
Supply Chain Resilience	SCR1	0.845	0.888	0.918	0.692
	SCR2	0.814			
	SCR3	0.831			
	SCR4	0.876			
	SCR5	0.789			

A key characteristic of validity is that all constructs must undergo measurement model assessment to confirm reliability and construct validity. As shown in Table 1, all factor loadings exceeded the recommended threshold of 0.70, indicating that each item explained a substantial portion of variance in its respective factor. Loadings ranged from 0.741 to 0.823 for digital payments, 0.817 to 0.872 for digital transactions, 0.807 to 0.916 for operational efficiency, 0.795 to 0.885 for smart contracts, and 0.789 to 0.876 for supply chain resilience. Internal consistency was confirmed with Cronbach's alpha values between 0.816 and 0.915 and composite reliability values ranging from 0.879 to 0.935 (all above 0.70). AVE values ranged from 0.645 to 0.741, exceeding the 0.50 threshold and confirming convergent validity. These results suggest that the construct items for supply chain resilience, operational efficiency, and Fintech adoption (digital transactions, digital payments, and smart contracts) are reliable and valid for inclusion in the subsequent structural model analysis.

Table 2. Discriminant Validity HTMT

	Digital Transactions	Digital Payments	Operational Efficiency	Smart Contracts	Supply Chain Resilience
Digital Transactions					
Digital Payments	0.64				
Operational Efficiency	0.349	0.373			
Smart Contracts	0.691	0.492	0.337		
Supply Chain Resilience	1.042	0.706	0.322	0.644	

As shown in Table 2, discriminant validity was assessed using the HTMT, with most construct pairs falling below the cutoff threshold of 0.85, indicating that discriminant validity was not a concern. Specifically, the HTMT values were 0.640 (digital transactions and digital payments), 0.349 (digital transactions and operational efficiency), 0.373 (digital payments and operational efficiency), 0.691 (digital transactions and smart contracts), 0.492 (digital payments and smart contracts), and 0.337 (operational efficiency and smart contracts). However, the HTMT value between supply chain resilience and digital transactions (1.042) exceeded the 0.85 threshold, suggesting potential redundancy or shared variance between these constructs. With this sole exception, the results generally support the discriminant validity of the constructs in the measurement model.

Table 3. Discriminant Validity (Fornell-Larcker)

	Digital Transactions	Digital Payments	Operational Efficiency	Smart Contracts	Supply Chain Resilience
Digital Transactions	0.843				
Digital Payments	0.555	0.803			
Operational Efficiency	0.335	0.343	0.861		
Smart Contracts	0.613	0.414	0.303	0.85	
Supply Chain Resilience	0.938	0.601	0.32	0.575	0.832

The Fornell–Larcker criterion was also applied to verify discriminant validity. As shown in Table 3, the square root of AVE for each construct was compared with its correlations with other constructs. The square roots of AVE were 0.843 for digital transactions, 0.803 for digital payments, 0.861 for operational efficiency, 0.850 for smart contracts, and 0.832 for supply chain resilience. In nearly all cases, these values were greater than the inter-construct correlations, confirming discriminant validity. However, the correlation between supply chain resilience and digital transactions was 0.938, which exceeded AVE_SC (0.832) and approached AVE_DT (0.843), suggesting a potential discriminant validity issue between these two constructs. For all other construct pairs, the criterion was satisfied, supporting discriminant validity in most cases.

4.3 Hypothesis Testing

The structural model, shown in Figure 2, was evaluated using bootstrapping with 5,000 subsamples to determine the significance of path coefficients. The results of hypothesis testing are presented in Table 4. Digital transactions had a significant positive effect on operational efficiency (β = 0.282, t = 5.772, $p < .001$), supporting H1, and a strong positive effect on supply chain resilience (β = 0.881, t = 19.741, $p < .001$), supporting H2. Digital payments also had a significant positive impact on operational efficiency (β = 0.038, t = 4.300, $p < .001$), supporting H3, and on supply chain resilience (β = 0.118, t = 5.933, $p < .001$), supporting H4. In contrast, smart contracts showed no significant relationship with either operational efficiency (β = −0.004, t = 0.349, p = .727) or supply chain resilience (β = −0.013, t = 0.359, p = .719), leading to the rejection of H5 and H6. Finally, supply chain resilience had a significant positive effect on operational efficiency (β = 0.320, t = 6.052, $p < .001$), supporting H7. The model explained 64% of the variance in operational efficiency (R^2 = 0.64), indicating substantial explanatory power. These findings suggest that while digital transactions and payments contribute positively to both operational efficiency and supply chain resilience, smart contracts play a negligible role. Moreover, the strong effect of supply chain resilience on operational efficiency highlights its importance as a strategic capability for maximizing the benefits of Fintech adoption in the industrial sector.

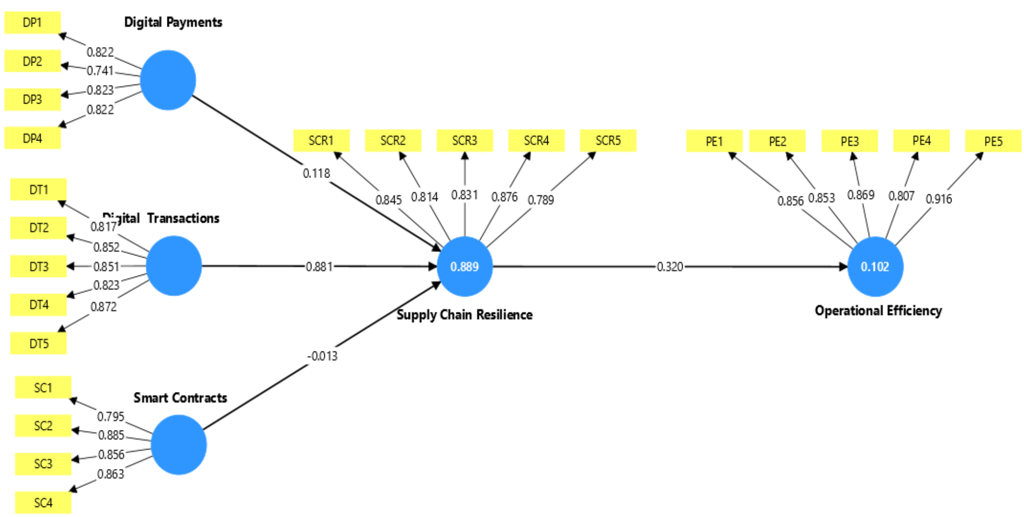

Figure 2. Structural Model Results Using PLS-SEM

Table 4. Structural model estimates (Path coefficients)

Hypo.	Relationships	Std. Beta	Std. Error	T-Value	P-Value	Decision
H1	Digital Transactions -> Operational Efficiency	0.282	0.049	5.772	0.000	Supported
H2	Digital Transactions -> Supply Chain Resilience	0.881	0.045	19.741	0.000	Supported
H3	Digital Payments ->	0.038	0.009	4.3	0.000	Supported

	Operational Efficiency					
H4	Digital Payments -> Supply Chain Resilience	0.118	0.02	5.933	0.000	Supported
H5	Smart Contracts -> Operational Efficiency	-0.004	0.012	0.349	0.727	Unsupported
H6	Smart Contracts -> Supply Chain Resilience	-0.013	0.037	0.359	0.719	Unsupported
H7	Supply Chain Resilience -> Operational Efficiency	0.32	0.053	6.052	0.000	Supported

5. Conclusions and Policy Implications

These financial capabilities enable industrial firms to streamline operations, enhance supply chain connectivity, and compete in the digital economy (Hatamlah et al., 2023). In Jordan's industrial sector, this study examined the effects of digital transactions, digital payments, and smart contracts on operational efficiency, with supply chain resilience as a moderator. The findings supported H1, H2, H3, and H4, showing that digitalization through transactions and payments significantly improves both operational efficiency and supply chain resilience. Among these, digital transactions demonstrated the greatest potential, accelerating payment flows, reducing procurement time, and maintaining uninterrupted supply operations (Haudi, 2024). A similar though less pronounced effect was observed for digital payments, which foster efficiency and resilience through safe, trackable, and rapid settlement systems that promote financial agility and operational coordination (Rose et al., 2024).

In contrast, H5 and H6 were rejected, as the proposed links between operational efficiency and smart contracts, and between supply chain resilience and smart contracts, were not supported. This outcome may be due to the early stage of blockchain adoption in Jordan's industrial sector, coupled with limited technical infrastructure, unstable regulations, and organizational unfamiliarity, which hinder the realization of potential benefits (Grzywaczewski et al., 2010). By contrast, H7 showed a strong positive effect of supply chain resilience on operational efficiency, suggesting that resilience functions as a strategic capability enabling organizations to respond proactively to disruptions, sustain supply chain operations, and optimize resource use. This aligns with the resource-based view, which holds that valuable, rare, and inimitable competencies generate sustainable competitive advantage (Horne, 2024).

Positive correlations for all hypotheses (except H4) suggest that adopting specific Fintech capabilities alongside strong supply chain resilience strategies offers viable paths to improving manufacturing process efficiency. From a managerial perspective, this underscores the importance of prioritizing digital transactions and payments while implementing resilience measures such as diversified sourcing, agile logistics networks, and proactive risk management. In addition, greater efforts may be needed to promote blockchain and smart contract adoption to realize operational gains. Strategic decisions should consider which Fintech tools to prioritize based on technological maturity, supply chain complexity, and organizational capacity to implement resilience practices. Industry associations can also play a role in accelerating Fintech integration by supporting knowledge transfer, regulatory clarity, and infrastructure development. Finally, this model could be extended to other sectors and moderating variables—such as company size, digital maturity, and temporal factors—to better understand the long-term effects of Fintech and resilience on operational performance.

5.1 Theoretical Implications

This essay highlights several avenues for theoretical research on how Fintech adoption—through digital transactions, digital payments, and smart contracts—affects operational performance and supply chain resilience in the industrial sector. A key area insufficiently explored in the literature is integration. While individual Fintech capabilities and supply chain resilience have been examined, this study introduces a theoretical model that explains 64% of the variability in operational efficiency by incorporating all major dimensions. This interdisciplinary contribution advances theory by linking Fintech adoption and supply chain resilience as joint drivers of operational performance. Furthermore, the findings extend the resource-based view (RBV) by positioning resilience not only as a unique strategic resource but also as a product of synergy between digital investment and digital transactions. Whereas RBV emphasizes relatively stable factors, our results suggest a dynamic, interactive perspective: firms with resilience capabilities—flexibility, redundancy, agility, and proactive risk management—can leverage digital transactions and payments to generate additional efficiency gains. Thus, the relationship between capabilities is particularly important from the perspective of the RBV. The absence of a significant smart contract effect also contributes to theory, suggesting that the benefits of novel Fintech applications may depend on environmental conditions, infrastructure levels, dependency structures, and institutional familiarity. Future research should therefore examine contextual and institutional factors influencing resistance to adoption, as well as firm size, digital readiness, sector, market, and national characteristics. These insights offer new perspectives for the theoretical debate on Fintech adoption and resilience development, while providing a foundation for further theoretical advancement. It is also recommended that future studies consider additional resources—such as human capital, digital culture, and cross-sector trust—to determine which capabilities are most effective for sustaining operations in the corporate digital landscape.

5.2 Practical Implications

These results provide clear guidance for managers in Jordanian industrial firms seeking to enhance operational efficiency through Fintech adoption. Firms should invest in digital transaction platforms to accelerate payment flows, reduce procurement delays, and maintain uninterrupted supply operations. In addition, cost-effective and secure online payment methods can improve cash flow, strengthen supplier relationships, and increase financial transparency. Although the direct benefits of smart contracts were less evident in our findings, the gradual development of blockchain ecosystems, institutional frameworks, and legal environments is likely to support their adoption. Managers should therefore monitor these developments closely and position their firms to benefit as the ecosystem matures.

In such an environment, it is not enough to simply remove barriers to resilience projects; Fintech initiatives should actively pursue supply chain resilience as a core capability. Technologies that enable agile logistics networks, flexible sourcing, and predictive risk management can work together to navigate disruptions and seize opportunities for peak efficiency. Interdisciplinary teams of operations, supply chain, finance, and information technology personnel are also essential to ensure that Fintech applications align with resilience-building efforts. Training and capacity building are equally important. Targeted workshops for operations and supply chain managers on using Fintech systems and interpreting real-time business transactions can support effective operational planning. Assigning clear ownership and accountability for tasks ensures alignment with organizational objectives and promotes efficiency. By combining focused Fintech investment with resilience strategies, industrial companies operating in dynamic environments can achieve shorter process cycles and make better use of resources and flexibility.

5.3. Limitations and Future Research

Several limitations should be acknowledged in this study. First, the empirical analysis focused solely on industrial firms in Jordan, limiting the generalizability of the findings to other sectors or geographical contexts. Future research should test the model in different industries and countries. Second, the data were obtained through self-reported questionnaires, which may introduce common method bias. Although statistical methods were applied to minimize this risk, future studies could incorporate objective performance measures or multi-source data to improve reliability. Third, only one moderator variable—supply chain resilience—was examined. Other contingencies, such as firm size, technological readiness, leadership support, and organizational culture, were not included and should be explored in future models. Fourth, the cross-sectional design assessed relationships at a single point in time, preventing evaluation of long-term consequences of Fintech adoption and resilience practices. Longitudinal designs would be useful to study how performance effects evolve as firms advance in digital maturity. Fifth, complementary qualitative methods, such as case studies or semi-structured interviews, could provide deeper insights into how managers adopt and integrate Fintech solutions into supply chain strategies. Finally, regulatory and policy considerations deserve attention. Licensing requirements and industrial policy may either hinder or support Fintech adoption, influencing managerial practices and skill needs. Understanding these dynamics could clarify how synergies between financial technologies and resilience capacities are realized.

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