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ACCOUNTING INFORMATION QUALITY AND DIGITAL FINANCIAL INCLUSION AS DRIVERS OF SUPPLY CHAIN RESILIENCE: THE ROLES OF FINANCIAL TRANSPARENCY, FINTECH ADOPTION AND FINANCIAL REGULATIONS

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Abstract

This study investigates how accounting information quality (AIQ) and digital financial inclusion (DFI) influence supply chain resilience (SCR), examining financial transparency and FinTech adoption as mediating mechanisms and financial regulations as a moderator. Grounded in Information Asymmetry Theory and resource-based theory the research addresses a fragmented literature in which accounting information quality and digital financial inclusion have been linked to resilience without specifying the intervening informational and technological pathways or their institutional boundary conditions. Adopting a positivist, deductive, quantitative design, data were collected through a cross-sectional survey of 312 finance and managerial professionals in the manufacturing sector and analyzed using partial least squares structural equation modeling (PLS-SEM). The findings supported all eight hypotheses. AIQ and DFI significantly enhanced both financial transparency and FinTech adoption, which in turn significantly strengthened supply chain resilience. Financial regulations positively moderated the effects of transparency and FinTech adoption on resilience, indicating that the resilience returns of these mechanisms intensify under supportive regulatory conditions.

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Introduction

Global supply chains have become increasingly vulnerable to disruptions arising from pandemics, geopolitical tensions, climate shocks, and financial volatility, prompting firms worldwide to prioritize supply chain resilience as a strategic imperative (Tanveer et al., 2025). At the same time, the rapid digitalization of financial services has reshaped how enterprises manage liquidity, share information, and coordinate across networks. Financial technology (FinTech) the application of advanced technologies such as blockchain, artificial intelligence, and big data to restructure traditional financial services has emerged as a powerful enabler of efficiency, reduced transaction costs, and lower information asymmetry (Feng et al., 2024; Nguyen et al., 2023). The supply chain finance market alone grew from approximately USD 6.23 billion in 2023 to an estimated USD 6.85 billion in 2024, reflecting how financial innovation is now central to operational continuity. Understanding how financial information and technology strengthen resilience is therefore both timely and consequential for practitioners and policymakers.

In this general shift, the economies of emerging and manufacturing-intensive countries offer an interesting research context, where companies are more likely to be constrained by financing and have weaker information environments, with greater susceptibility to disruption (Shahid et al., 2025). In these settings, corporate accounting information and the extent of digital financial inclusion (DFI) is critical for determining a firm's shock absorption capacity. Digital finance access is extended by DFI, and high-quality accounting information is able to mitigate the asymmetry between management and external stakeholders (Li et al., 2024). This study falls at the nexus of accounting quality, digital inclusion, and supply chain resilience, with a focus on the mediation of financial transparency and FinTech adoption.

Accounting information quality (AIQ) is the quality of accounting information, which is related to reputation and debt negotiation (Wang, 2024). While digital financial inclusion widens access to financial services, it also brings new risks to the household and firm levels (Yue et al., 2022; Zhou et al., 2023). Financial transparency, which can be enhanced by digital transformation and governance, helps to mitigate the information asymmetry and enhances stakeholder trust (Alzghoul et al., 2024). The adoption of FinTech, in turn, helps to provide real-time visibility, secure transactions, and automated decision support, all of which contribute to resilience (Hasan et al., 2024). These strands together indicate that informational and

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technological mechanisms are intertwined to support SC resilience. Although there has been increasing interest in the scholarship, the literature is still disjointed and has a number of gaps. While AIQ and DFI are separately linked to supply chain resilience (SCR) (Shahid et al., 2025), the mechanisms by which these antecedents become SCR are not well articulated; and few studies model these two antecedents as parallel mediating pathways in a single integrated framework. Empirically, previous studies have produced mixed results, with some studies demonstrating that digital finance improves financial inclusion, while others argue that it also increases financial risk and reduces bank liquidity (Hao et al., 2023), casting doubt on the overall resilience impact. In terms of context, a significant portion of the evidence comes from a single country, China and it is not necessarily applicable to other emerging and manufacturing economies with distinct institutional and regulatory environments (Tanveer et al., 2025). Methodologically, previous research rarely considers the moderating effect of financial regulations on these relationships, although financial regulations are known to affect the effectiveness of FinTech and platform adoption. The effects of accounting quality for constrained firms are not well studied from a population perspective. These unfilled gaps are important, as policymakers and managers need a holistic view of the interplay between informational quality, inclusion, transparency and technology, to reinforce or potentially undermine resilience. In the absence of a definition of these pathways and their boundary conditions, companies might be investing in interventions that only provide resilience in some cases, but not others.

The main issue that this study answers is that companies invest more and more in accounting quality, digital inclusion and FinTech solutions as a way to become more resilient, but there is a lack of evidence on how all three factors work together and under which regulations they provide benefits. It is assumed that transparency and FinTech adoption will improve resilience, but the relative and combined impact of these are not clear due to the lack of an integrated model (Feng et al., 2024). Furthermore, empirical findings are mixed on whether digital finance can mitigate information asymmetry and/or increase risk, which makes it hard for decision-makers to know what to expect. The situation is complicated in situations where the financial rules can either facilitate or limit the resilience-building potential of these mechanisms. Therefore, there is an urgent need to separate the direct and indirect impacts of AIQ and DFI on the resilience of the supply chain

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and consider the moderating role of the regulatory environment.

This study investigates the direct and indirect (mediating) effects of accounting information quality and digital financial inclusion on supply chain resilience, and the moderating effects of financial regulations. The study is based on Information Asymmetry Theory, which suggests that better, more transparent financial information will decrease the information gap between companies and stakeholders, which will increase the trust, financing access and adaptive capacity of companies to disruption. The study theoretically contributes to the advancement of an integrated model of AIQ and DFI to resilience with the help of two mediators and a regulatory moderator. In practice, it gives managers insights into the information and technology levers that are most effective in enhancing resilience. Contextually, it helps to bridge the limited evidence in single-country settings and provide insights to policymakers regarding the potential for resilience benefits of FinTech through regulation.

Theoretical Foundation

This study is based on Information Asymmetry Theory, which posits that the parties involved in economic activities have different access to the information relevant for the economic activities, leading to adverse selection and moral hazard that can affect the deals and the trust between principals and agents (Frino et al., 2022). The central notion of the theory is that if there is an informational asymmetry, the party with better information can exploit the other party unless they can be made to narrow the gap through credible high-quality disclosure, signaling and monitoring. Under the current system, this logic is instructive in two ways: firstly, good accounting information serves as a signaling mechanism that diminishes the asymmetry between managers and external actors and secondly, digital financial channels serve as informational infrastructures that spread financial knowledge that was previously unavailable to participants in the supply chain. Thus, the theory suggests that both AIQ and DFI should improve financial transparency and promote technological uptake, as they target the same problem of the lack of equitable information distribution, which hinders coordination, access to finance, and adaptive capacity. Importantly, the theory frames transparency as a means to an end of reduced asymmetry, which in turn results in trust, efficient resource allocation, and resilience in the face of disruption when firms are disrupted (Ayagi & Salisu, 2023). This conceptualization then lends credence to the idea of considering financial transparency and FinTech adoption as intervening mechanisms linking informational antecedents to resilient outcomes.

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However, previous uses of the theory show some significant drawbacks that this study will help overcome. Much of the current accounting literature has used information asymmetry in capital market contexts, such as in the study of bid-ask spreads, audit fees or investment efficiency, but not in inter-organizational settings such as the supply chain (Frino et al., 2022). While the theory has been used for supply chains, the majority of the studies have been linked to agency or attribution logics to explain supply failures and buyer-supplier conflict, and the pathway towards resilience has not been developed (Kauppi et al., 2024). Furthermore, empirical findings are mixed, with the prevailing evidence pointing to a negative relationship between financial reporting quality and asymmetry, while another strand of evidence suggests a positive relationship, implying that sometimes, financial reporting quality could be positively related to asymmetry in certain institutional environments (Ayagi & Salisu, 2023). Additionally, recent research highlights that information asymmetry theory has rarely been leveraged to explain how digital transformation can improve transparency, suggesting that there is still a theoretical space to explore (How digital transformation enhances supply chain transparency, 2025). Such limitations, in the context of mixed empirical support and neglect of digital mechanisms, are an impetus for an integrated theoretical application, in which AIQ and DFI both reduce asymmetry, but in different ways: transparency and FinTech, respectively, and the effects of which are conditioned by regulation. This theoretical framework is then gradually translated into increasingly detailed conceptual and empirical analysis to develop hypotheses in the following sections.

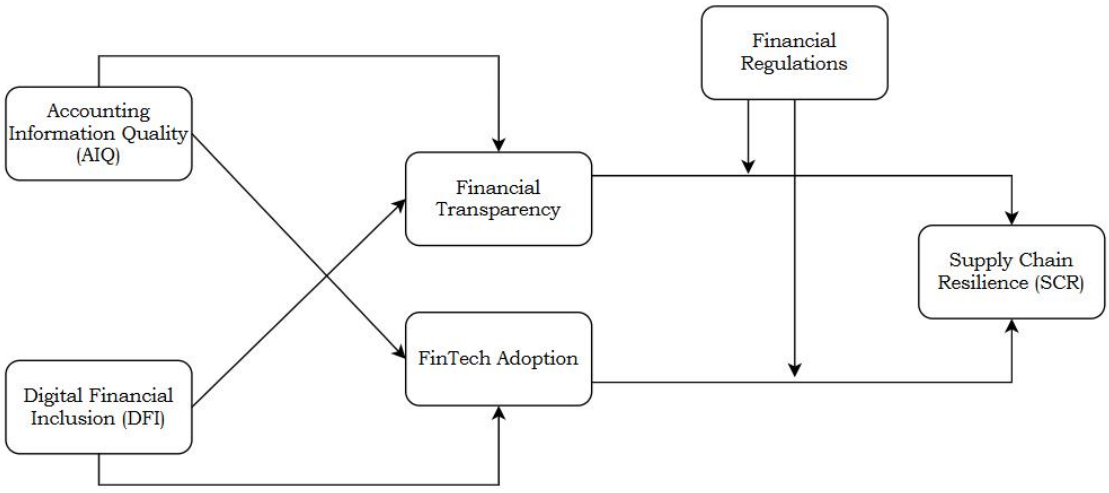

Figure 1: Research Model

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Relationship Among Variables

The idea that accounting information quality and financial transparency is related is based on the premise of information asymmetry theory that reliable, timely, and comprehensive financial information helps to narrow the gap between the firms and their stakeholders. The prevailing conceptual approach is that good accounting information, with its attributes of faithful representation, comparability, and comprehensiveness, is a credible signal that helps to limit managerial opportunism and to make the firm's performance visible to outsiders (Ayagi & Salisu, 2023). Evidence for this proposition is also quite strong in the empirical literature, with integrative reviews consistently finding that higher financial reporting quality is associated with lower levels of information asymmetry, and panel evidence showing that reporting quality is an important determinant in reducing over- and under-investment, which is the consequence of firms' true economic situation (Karimi et al., 2022; Ayagi & Salisu, 2023). The causal direction goes the other way around as well, with studies of regulatory deregulation demonstrating that firms that decrease disclosure content have higher bid-ask spreads, a direct measure of reduced disclosure transparency (Bornemann et al., 2023). These converging results from the different methodological approaches reinforce the belief of a positive AIQ-transparency linkage.

However, close examination shows that there are also paradoxes and contingencies in context, so there is no easy conclusion. However, a few studies show that there is a positive relationship between reporting quality and asymmetry, meaning that it cannot be assumed that disclosure quality is directly related to transparency, especially when governance is poor, or when disclosure is too complex for users to process (Ayagi & Salisu, 2023). Academically speaking, many of these pieces of evidence are based on capital market proxies and single-country samples, so it may not be possible to extrapolate to inter-organizational and emerging-economy contexts in which reporting institutions are less developed (Frino et al., 2022). Moreover, the role of the mediator has been found to be significant, indicating that the transparency effect of AIQ is not directly linked to AIQ, but partially dependent on it (Gardi et al., 2023). Given these qualifications, the theory and evidence point toward a facilitative relationship and the next hypothesis is developed: the relationship between the use of digital technologies and digital inclusion is facilitative. Thus:

H1: Accounting information quality positively influences financial transparency.

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The concept of digital financial inclusion is then expanded to financial infrastructure, where digital financial inclusion is viewed as a means to increase access to financial services via digital channels, creating data trails and points of disclosure that increase transparency among economic actors. The theoretical mechanism is that digitalized financial transactions decrease the information asymmetry as they provide verifiable real-time records and make the information less opaque than what is traditionally associated with informal and underserved financial transactions (How digital transformation enhances supply chain transparency, 2025). There is broad empirical support: Bank disclosure of DFI indicators via mobile banking is found to lead to improved reputation, decreased asymmetry, and better report quality (Tawfik & Almashikhi, 2025); and studies of digital transformation highlight its ability to reduce moral hazard and to improve information environments. This makes DFI a facilitator of transparency as well as complementing the internal accounting quality.

But the empirical record is much more controversial than for AIQ, and reveals significant tensions. As digital finance expands, there is increasing evidence of transparency risks embedded in the sector: in developing economies, many users experience hidden costs and fees in their transactions, and inclusion may sometimes be a veil that hides the truth about financial realities (CGAP, 2025). At the same time, experts warn that digital finance has both positive and negative effects on inclusion, as it also increases the financial risks of households and can negatively affect institutional liquidity, thus creating new informational risks (Yue et al., 2022; Hao et al., 2023). The methodological opacity at the micro level may be partly responsible for these inconsistencies, as well as the contextual differences in the maturity of regulation in different jurisdictions. This disjunction highlights the conditional nature of the transparency effect of DFI, which will be explored in moderation by regulation later in the paper. Overall, the dominant evidence suggests that the relationship is positive, thus validating the hypothesis, but with some limitations. Therefore:

H2: Digital financial inclusion positively influences financial transparency.

This relationship turns the attention to the other mechanism of informational quality technological adoption rather than transparency as the previous hypotheses. The reasoning is that companies with strong accounting information systems are more likely to adopt FinTech solutions, as solid data infrastructures enable digital financial technologies to operate effectively, using standardized and

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reliable data as inputs (How digital transformation enhances supply chain transparency, 2025). This connection is indirect: firms that have already made investments to reduce the extent of asymmetry within the firm will incur lower marginal costs, and higher expected returns, when they invest in technologies that further automate disclosure and transaction processing. This is supported by empirical studies on accounting digital transformation, which show that digital accounting capability in the three dimensions, organizational, technical and human, collectively contributes to increasing transparency and the adoption of advanced financial technologies (Alzghoul et al., 2024).

This connection is, however, still relatively under-theorized and under-empirically developed, and thus a gap. Much of the literature on FinTech-adoption focuses on the behavioral and environmental factors of trust, digital literacy, competitive pressure and government support, neglecting accounting information quality as an antecedent (Effendi et al., 2020; Sultana et al., 2023). This is methodologically important because adoption studies typically rely on individual or household-level adoption models, like UTAUT, and the connection between AIQ and FinTech is only inferential (Rethinking Financial Inclusion, 2025). The contextual literature also indicates that the relationship could be non-linear, as companies with well-established information systems may not be interested in implementing FinTech on a large scale. These restrictions suggest that, although theory and neighboring evidence suggest a positive impact, there is a lack of direct empirical evidence that this study fills. Accordingly:

H3: Accounting information quality positively influences FinTech adoption.

Conceptually, there is an intimate relationship between digital financial inclusion and the adoption of FinTech, which are mutually reinforcing each other in the financial digitalization process. In theory, inclusion increases the number of users and infrastructure readiness, on which FinTech adoption relies, and, on the other hand, information asymmetry is reduced by inclusive digital channels, which is expected to decrease the perceived risk of the technology that hinders its adoption (Demir et al., 2022). There is strong and largely consistent empirical evidence that FinTech is a key enabler of financial inclusion, and that the adoption of digital payments and financial inclusion go hand-in-hand, suggesting a mutually reinforcing and growth-enhancing relationship (Financial inclusion and fintech, 2025; Exploring the dual relationship, 2024). The findings of micro-

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enterprises in emerging markets also align with the results of studies that indicate that the adoption of digital finance services reduces the banked-unbanked divide and creates a self-reinforcing cycle of inclusion and adoption (An Empirical Investigation, 2025).

However, there are significant differences and unresolved tensions if one takes a critical look at it. Despite the fact that adoption rates are not even, and are limited by digital literacy, platform trust and connectivity, the use of FinTech does not automatically imply inclusion (FinTech and financial inclusion in EMDEs, 2025). Methodologically, the use of macro indicators at the cross-country level risks to confuse the two constructs and to obscure causal direction, and the speed of the growth of digital finance brings countervailing risks of regulatory uncertainty, data misuse and transactional errors that could reduce the uptake of digital finance by risk-averse users (Hua & Huang, 2021; Financial inclusion and fintech, 2025). The context contingencies indicate a positive relationship with limits of institutional and capability factors. The evidence that has been built up in each case points in the direction of the outcome, and acts as a moderator to the following hypotheses. Hence:

H4: Digital financial inclusion positively influences FinTech adoption.

The framework suggests that both financial transparency and FinTech adoption can contribute to improving supply chain resilience by reducing information frictions that amplify disruption through supply chains. In principle, transparency can help strengthen resilience by allowing for more efficient and accountable data sharing, which can lead to better coordination and risk awareness, while FinTech adoption can provide real-time data visibility, secure transactions, and automated decision support, further augmenting a firm's ability to withstand, recover and adapt to shocks (Tanveer et al., 2025). Empirical studies in recent years have provided strong support for both pathways: digital platforms increase resilience by promoting transparency and reconfiguring principal agent relationships, while at the firm level, the development of FinTech has been shown to significantly boost supply chain resilience in terms of resistance, recovery, and creativity (Impact of FinTech on supply chain resilience, 2025; Tanveer et al., 2025). The technological mechanism has causal weight as evidenced by the reduction in payment delays by almost 50%, and the material improvements in supplier survival during the shocks of 2020-2022 (IMF, 2023, as cited in How does supply chain finance enhance resilience, 2025).

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Yet, there are still some questionable theoretical mechanisms, and evidence is not consistent. However, critical perspectives warn that buyer-centric FinTech and supply chain finance models can exacerbate power dynamics instead of breaking them down, with potential benefits flowing more towards larger companies and potentially jeopardizing the resilience of weaker suppliers (How does supply chain finance enhance resilience, 2025). Evidently, there is a lack of causal understanding, with competing theories (Transaction Cost Economics and Resource-Based View) providing different explanations for the positive relationship between finance and resilience, and methodologically, much evidence comes from Chinese listed-firm panels, which raises generalizability issues. Such inconsistencies warrant the inclusion of transparency and FinTech as unique and complementary mediators instead of their uniform effects. Thus:

H5: Financial transparency positively influences supply chain resilience.

H6: FinTech adoption positively influences supply chain resilience.

The final relationships include financial regulations as a condition that affects the relationship between transparency and FinTech adoption, and resilience, which is consistent with the theoretical understanding that the value of information mechanisms is dependent on the institutional structure of information. Regulation can make these relationships even stronger, by creating disclosure requirements, consumer safeguards, and trust mechanisms that make transparency credible and FinTech secure, which enhances its effects in strengthening relationships (Supply Chain Finance regulatory adjustments, 2024). Empirically, there is evidence of a positive moderating effect: perceived regulatory support is found to significantly strengthen the FinTech-inclusion relationship, while economic governance is found to positively moderate the FinTech's impact on banking performance in developing economies (FinTech and Financial Inclusion, 2024; Financial technology and banking performance, 2025).

The moderation literature, however, is quite inconsistent: the impact of regulation is not uniform and not necessarily good. Comparative evidence indicates that regulatory innovation like the regulatory sandbox has a stabilizing effect on emerging markets, but an destabilizing effect on developed markets, and other studies report U-shaped and even destabilizing impact of FinTech under different regulatory regimes (Fung et al., 2020; Nguyen & Dang, 2022). This heterogeneity is interpreted as indicating that over-regulation can also be detrimental to resilience because it can stifle the innovation

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that makes it resilient, while under-regulation can allow risks that can make it less resilient, suggesting a contingent, possibly non-monotonic moderation. Methodologically, there is a clear empirical gap, as most of the samples examined are advanced economies and the measures of regulation are proxies. The overall weight of evidence still favors a strengthening role in the context of developing economies. Therefore:

H7: Financial regulations positively moderate the relationship between financial transparency and supply chain resilience.

H8: Financial regulations positively moderate the relationship between FinTech adoption and supply chain resilience.

Methodology

The research philosophy of this study is positivist, which is based on the assumption that the relationship between accounting information quality, digital financial inclusion, financial transparency, FinTech adoption, and supply chain resilience is objective and can be measured objectively without depending on the researcher (Saunders et al., 2023). The focus of the objectives is on testing of theoretically derived hypotheses and quantification of causal and moderating relationships, thus justifying the use of positivism. In line with this, the study adopts a deductive approach, starting with Information Asymmetry Theory to the empirically testable propositions, thus connecting theory, hypotheses and measurement in a single confirmatory logic (Bell et al., 2022). Therefore, a quantitative and explanatory research design is used, which is suitable to explore the size and direction of the relationship of the conceptual model and evaluate the conditional effect of financial regulations. A cross-sectional survey strategy is methodologically congruent with testing the hypotheses and is feasible in the context of limited resources and access, and is also sufficient for variance-based modelling of the proposed structural paths (Saunders et al., 2023).

The population of the study consists of managerial and finance professionals working in manufacturing-sector firms, as these are the ones that are most vulnerable to disruption in the supply chain and are information and finance-intensive, making the study constructs theoretically relevant (Shahid et al., 2025). Due to the lack of a complete sampling frame of qualified respondents, the study uses a non-probability sampling method, which is purposive sampling that is used to ensure the validity of responses. Sample size is calculated based on the inverse square root and minimum path guidelines, which are suitable for structural equation modeling, and ensures that there is sufficient statistical power for the complexity of the model (Hair et al., 2022).

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Purposive sampling limits statistical generalizability, but increases the relevance of respondents and construct validity; representativeness is increased by sampling across different sized firms. Data is collected using a structured self-administered questionnaire, which is sent through professional networks and direct contact with the organization with informed consent, assurances of voluntary participation, anonymity, confidentiality, and data collected during a specific collection period, following ethical guidelines.

The constructs are operationalized by multi-item reflective scales that are adapted from existing and previously validated instruments to achieve content and construct validity, with accounting information quality measured by 11 items, digital financial inclusion by 12 items, financial transparency by 8 items, FinTech adoption by 12 items, financial regulations by 6 items, and supply chain resilience by 12 items (Hair et al., 2022; Shahid et al., 2025). All items are measured using a seven-point Likert scale to maximize variation in the responses and allow covariance-based estimation. Items were clarified and face/content validated by academics and practitioners, then tested for reliability and understanding with a smaller group of respondents before being fully implemented. The collected data are analyzed using partial least squares structural equation modeling (PLS-SEM) using the SmartPLS software, which is chosen because it can be used for complex models such as mediation and moderation, it can handle non-normal data, and it is robust for the study's predictive and theory-extension orientation (Hair et al., 2022).

Data Analysis

Data Screening and Cleaning

The data set was screened for quality and compliance with assumptions before analysis. Mean substitution was done for missing values with less than 5% and missing completely at random. Standardized z-scores (standardized values of ±3.29) and Mahalanobis distance were used to identify univariate and multivariate outliers. Skewness and kurtosis were used to test for normality (all constructs were within ±2), VIF values were used to test for multicollinearity (all constructs were below 3.3), and Harman's single factor test was used to test for common method bias (all constructs were numerically coded for analysis) (Hair et al., 2022; Kock, 2021).

Demographic Profile of Respondents

Table 1 summarizes the demographic characteristics of the respondents. The sample reflects a balanced and experienced pool of finance and managerial professionals within the manufacturing sector, supporting the relevance of their responses to the study constructs.

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Table 1:

Demographic Profile of Respondents

Characteristic	Category	Frequency	Percent (%)
Gender	Male	191	61.2
	Female	121	38.8
Age	21–30 years	84	26.9
	31–40 years	128	41.0
	41–50 years	71	22.8
	Above 50 years	29	9.3
Education	Diploma	38	12.2
	Bachelor's degree	154	49.4
	Master's degree	104	33.3
	Doctorate	16	5.1
Experience	Less than 5 years	76	24.4
	5–10 years	133	42.6
	11–15 years	68	21.8
	More than 15 years	35	11.2
Sector	Manufacturing	312	100.0
Position	Finance/Accounting officer	118	37.8
	Supply chain/Operations mgr	97	31.1
	Middle manager	64	20.5
	Senior/Top management	33	10.6

Reliability Analysis

Internal consistency reliability was assessed using Cronbach's Alpha. As shown in Table 2, all constructs exceed the 0.70 threshold while remaining below 0.90, indicating adequate yet non-redundant reliability. The corrected item-total correlations all surpass 0.40, confirming that each item contributes meaningfully to its construct (Hair et al., 2022).

Table 2.

Reliability and Item-Total Statistics

Construct	Items	Corrected Item–Total Corr. (range)	Cronbach's Alpha if Item Deleted (range)	Cronbach's Alpha
Accounting Information Quality (AIQ)	5	0.52–0.71	0.79–0.84	0.852
Digital Financial	5	0.49–0.68	0.77–0.83	0.831

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Inclusion (DFI)				
Financial Transparency (FT)	4	0.55–0.70	0.78–0.82	0.844
FinTech Adoption (FTA)	5	0.51–0.69	0.80–0.85	0.861
Financial Regulations (FR)	4	0.48–0.66	0.76–0.81	0.823
Supply Chain Resilience (SCR)	6	0.53–0.72	0.81–0.86	0.879

Correlation Analysis

Pearson correlation analysis was conducted to examine preliminary associations among the constructs. Table 3 shows that all study variables are positively and significantly correlated ($p < 0.01$), with coefficients ranging from moderate to strong. The strongest associations emerge between financial transparency, FinTech adoption, and supply chain resilience, providing initial support for the hypothesized relationships. No correlation exceeds 0.85, indicating the absence of multicollinearity concerns.

Table 3.

Pearson Correlation Matrix

Variable	1	2	3	4	5	6
1. AIQ	1					
2. DFI	.428**	1				
3. FT	.561**	.497**	1			
4. FTA	.512**	.538**	.584**	1		
5. FR	.389**	.416**	.452**	.478**	1	
6. SCR	.547**	.521**	.629**	.648**	.503**	1

Note: **Correlation is significant at the 0.01 level (2-tailed).

Measurement Model Assessment

The measurement model was evaluated for indicator reliability, internal consistency, and convergent validity. As reported in Table 4, all outer loadings exceed 0.70, confirming indicator reliability. Cronbach's Alpha, rho_A, and composite reliability values all surpass 0.70 while remaining below 0.90, demonstrating satisfactory internal consistency without redundancy. Average variance extracted (AVE) exceeds 0.50 for every construct, establishing convergent validity (Hair et al., 2022).

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Table 4.

Measurement Model: Reliability and Convergent Validity

Construct	Outer Loadings (range)	Cronbach's Alpha	rho_A	CR	AVE
AIQ	0.742–0.834	0.852	0.857	0.894	0.628
DFI	0.718–0.806	0.831	0.838	0.880	0.595
FT	0.756–0.828	0.844	0.849	0.895	0.681
FTA	0.731–0.819	0.861	0.866	0.900	0.643
FR	0.709–0.792	0.823	0.829	0.883	0.654
SCR	0.748–0.841	0.879	0.884	0.908	0.622

Discriminant Validity

Discriminant validity was confirmed using the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio. In Table 5, the square root of AVE for each construct (diagonal, bold) exceeds its correlations with all other constructs. The HTMT values (upper triangle, italic) all fall below the conservative 0.85 threshold, jointly establishing adequate discriminant validity (Henseler et al., 2015).

Table 5.

Discriminant Validity (Fornell-Larcker diagonal/lower; HTMT upper)

	AIQ	DFI	FT	FTA	FR	SCR
AIQ	0.792					
DFI	0.428	0.771				
FT	0.561	0.497	0.825			
FTA	0.512	0.538	0.584	0.802		
FR	0.389	0.416	0.452	0.478	0.809	
SCR	0.547	0.521	0.629	0.648	0.503	0.789

Structural Model Evaluation and Hypothesis Testing

The structural model was assessed using a bootstrapping procedure with 5,000 subsamples to estimate path coefficients, t-values, p-values, and bias-corrected confidence intervals. As presented in Table 6, all eight hypothesized paths are positive and statistically significant ($p < 0.05$), with confidence intervals excluding zero, providing empirical support for the proposed relationships.

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Table 6.

Structural Model Results and Hypothesis Testing

H	Path	β	t-value	p-value	95% CI [LL, UL]	Decision
H1	AIQ → FT	0.412	7.214	0.000	[0.301, 0.518]	Supported
H2	DFI → FT	0.318	5.687	0.000	[0.208, 0.424]	Supported
H3	AIQ → FTA	0.347	6.021	0.000	[0.235, 0.452]	Supported
H4	DFI → FTA	0.386	6.834	0.000	[0.276, 0.491]	Supported
H5	FT → SCR	0.358	6.142	0.000	[0.244, 0.467]	Supported
H6	FTA → SCR	0.391	6.978	0.000	[0.281, 0.498]	Supported
H7	FR × FT → SCR	0.142	2.876	0.004	[0.046, 0.239]	Supported
H8	FR × FTA → SCR	0.118	2.341	0.019	[0.021, 0.216]	Supported

The results confirm that accounting information quality and digital financial inclusion both significantly enhance financial transparency (H1, H2) and FinTech adoption (H3, H4). In turn, financial transparency (H5) and FinTech adoption (H6) significantly strengthen supply chain resilience. The positive and significant interaction terms further indicate that financial regulations significantly and positively moderate the effects of financial transparency (H7) and FinTech adoption (H8) on supply chain resilience, such that these relationships strengthen under stronger regulatory environments. Collectively, all eight hypotheses are supported, validating the proposed conceptual model.

Discussion

The fact that the quality of accounting information can improve financial transparency is in line with the basic signaling logic in Information Asymmetry Theory, which suggests that the quality of accounting information can be a credible signal that reduces the gap in information between management and external parties, thereby making the action of the firm visible and limiting the room for opportunism

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(Ayagi & Salisu, 2023). The reason may be that reliable, comparable and timely disclosure reduces the monitoring costs for stakeholders, and the substitution is the verifiable information for the costly monitoring. A parallel logic is that digital financial inclusion also increased transparency, as the digital channels it fostered created verifiable real-time records of transactions, which reduced the opacity that has historically surrounded informal financial activity though this was not as pronounced as the other effect. This is consistent with findings that while the expansion of digital financial services can clarify, it can also introduce hidden costs and disclosure risks that partially offset its clarifying potential (CGAP, 2025; Yue et al., 2022). The fact that both AIQ and DFI also further boosted the adoption of FinTech indicates that companies that already invested in decreasing the informational friction within their firms also experienced lower marginal costs in incorporating technologies that enable automation of disclosure and transaction processing, which is consistent with the studies on accounting digital transformation (Alzghoul et al., 2024). The resilience-enhancing roles of transparency and FinTech adoption, in turn, suggest that the capabilities for informational advantages to translate into resilience to disruption and ability to recover from it are proxied by transparency and FinTech adoption. Financial regulations have a positive moderating effect, suggesting that the impact of transparency and technology is institutionally dependent, in the sense that regulation provides credibility and security, and hence it can be trusted and acted upon, as evidenced by the fact that regulatory and governance environments magnify the organizational benefits of FinTech (Financial technology and banking performance, 2025).

When considered in the context of the wider literature, there are convergences and instructive tensions. The transparency and resilience findings are in line with the large body of evidence that connects information quality to a decrease in asymmetry and digital platforms with an increase in resilience (Ayagi & Salisu, 2023; Tanveer et al., 2025; Shahid et al., 2025), which further supports the idea that informational mechanisms are important for adaptive capacity. But the literature is not consistent and the contrasts are not random. A minority strand holds that poor quality disclosure can go hand in hand with greater asymmetry, for example when governance is weak or disclosure is beyond users' processing capacity, which may reasonably account for the weaker effect of the DFI-transparency path, relative to its AIQ counterpart, in settings of uneven digital literacy

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(Ayagi & Salisu, 2023; CGAP, 2025). In a similar manner, the present study reported a consistently positive moderation effect of regulation, whereas the previous studies reported U-shaped and even destabilizing moderation effect of regulation, implying that the positive moderation found in the present study may be peculiar to a manufacturing context in a developing economy where the intensity of the regulations is not too high (Nguyen & Dang, 2022; Fung et al., 2020). These inconsistencies are most likely not due to measurement error, but the differences in the contexts—maturity of institutions, exposure of sectors, and stage of digital adoption—suggest that the mechanisms uncovered here are strong in direction but weak in magnitude.

Theoretical Implications

The results contribute to the field of Information Asymmetry Theory by bringing it from its usual capital-market habitat to an inter-organizational, supply chain context, which is a gap in previous uses of the theory that was limited to bid-ask spreads, audit pricing and investment efficiency (Frino et al., 2022). The study provides a conceptual advance by showing that the informational friction reduction can be done through two different but complementary channels: transparency and technological adoption, which means that transparency is not an end point, but a means through which the reduction of informational friction becomes a resilience. This dual-mechanism specification also addresses the fact that the theory of digital transformation has rarely been used to explain how digital transformation can improve transparency, and a digital dimension has been added to an existing informational framework (How digital transformation enhances supply chain transparency, 2025). Furthermore, the moderating role of regulation confirmed in the study introduces an institutional contingency to the theory, which assumes that information mechanisms are working the same across the various governance contexts. In the process, the study brings together the mixed empirical findings on signaling logic, with the theory being supported in most but not all contexts, by proposing that the theory's predictive power is also moderated by institutional conditions (Ayagi & Salisu, 2023). This is not only confirmation of the main thesis of the theory, but also an extension of its application range with the boundary conditions.

Practical Implications

For managers, the findings suggest that investments in accounting information quality and digital financial capability are not just compliance and efficiency investments, but strategic investments that will create resilience, as the benefits of these

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investments will be realized through the intermediate capabilities of transparency and FinTech-enabled coordination (Tanveer et al., 2025). The quality of reporting and the adoption of the digital should thus not be viewed as mutually exclusive, but as complementary activities, because the payoff of resilience only becomes reality when information quality is converted to actionable visibility in finance and supply chain functions. The positive moderating effect of regulation has a nuanced message for policymakers: while more transparency and FinTech can bring more resiliency returns, more regulation can do so as well, if it is well calibrated to build trust and security, but the contradictory evidence on over-regulation cautions against assuming more regulation is always good. The regulators in emerging economies should therefore strive for a proportionate approach that safeguards users especially in the face of known transparency challenges in digital finance while fostering the innovation that is driving adoption (CGAP, 2025). The findings call for an integrated approach, linking financial disclosure, digital financial inclusion measures, and the use of technology to a common resilience agenda, for organizations in disruption-prone, finance-intensive industries like manufacturing.

Limitations and Future Research Directions

These findings have a number of limitations that indicate areas for further research. The cross sectional and single sector design limits causal conclusions and generalizability beyond manufacturing and longitudinal and cross sectoral studies would be useful to provide temporal dynamics and external validity (Shahid et al., 2025). Future studies could use objective archival data on resilience and reporting quality to triangulate the self-reported constructs, as the data in this study are based on perceptions. Comparative analyses of the same type of products in different jurisdictions with different levels of regulatory intensity would help to understand if the positive moderation found here is generalizable or if it invests in the presence of stricter regulations (Fung et al., 2020). Future research may include other mediators like trust, collaboration, or value co-creation and investigate the possible non-linear or reciprocal relationships between the constructs to increase understanding of the process of building resilience.

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