

Leveraging FinTech for Trade Competitiveness: Evidence from India

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Abstract

This study examines how FinTech-related structural factors influence India's international trade flows using annual data from 2010-2023. Employing time-series regressions with standard diagnostic tests, the analysis evaluates the role of FinTech through two channels: domestic market size and foreign direct investment (FDI). The results show that FDI has no significant effect on export or import growth, whereas changes in domestic market size exhibit a strong, statistically significant positive relationship with both trade components. These findings suggest that FinTech enhances trade primarily by expanding and formalizing the domestic market through digital payments, SME credit access, and efficient financial infrastructure. The study underscores FinTech's role as a trade-enabling ecosystem supporting India's global integration.

Keywords: FinTech, International Trade, Trade Flows, FDI, Emerging Market

JEL Classification: F10, F14, O16, G20

Introduction

India's increasing integration into global value chains has intensified the need for efficient trade infrastructure. Traditional cross-border processes continue to incur high transaction costs, procedural delays, and financing constraints – issues widely documented in empirical studies on emerging economies (Allen, 2021; Kannan, 2019; Cumming et al., 2023). FinTech innovations present a structural shift capable of addressing these long-standing frictions.

Recent scholarship illustrates that digital financial technologies reduce information asymmetry, improve capital allocation, and enhance transactional efficiency, thereby influencing international trade performance (Gomber et al., 2018; Lee et al., 2023). In the Indian context, FinTech tools including real-time payment systems, blockchain-enabled trade finance, Aadhaar-based digital identity verification, and alternative-data credit scoring have fundamentally altered how firms access credit, manage documentation, and execute cross-border payments. These mechanisms provide measurable reductions in financial and logistical friction, with particular relevance for SMEs that face persistent credit constraints (Kulshrestha, 2023; Goswami et al., 2022).

This paper positions FinTech not simply as a complementary financial innovation but as a trade-enabling digital infrastructure. By lowering operational costs, increasing transparency, and simplifying compliance processes, FinTech adoption has the potential to expand both the intensive (trade volumes) and extensive (firm participation, market diversification) margins of India's trade. Using secondary data from 2010-2023, this study evaluates the statistical relationship between FinTech market growth and India's trade flows.

The remainder of this paper follows a standard structure. Section 2 presents the literature review; Section 3 outlines the research objectives and methodology; Section 4 discusses the empirical results; Section 5 highlights limitations; and Section 6 concludes with policy implications and future research directions.

Section 2 presents a literature review focusing on FinTech, financial access, and international trade dynamics in emerging economies. Section 3 outlines the research objectives and methodology. Section 4 discusses the empirical findings. Section 5 highlights limitations, while Section 6 concludes with policy implications and avenues for future research.

Literature Review

Research examining the interface between FinTech and international trade has expanded considerably in recent years, reflecting broader technological shifts in global financial systems. The literature can be organised into four interrelated streams: (1) digital payment and settlement efficiency, (2) trade finance innovation, (3) financial inclusion and SME integration into global markets, and (4) capital flows and macro-financial linkages. Extending these themes provides a more comprehensive foundation for understanding how FinTech affects India's trade performance.

1. Digital Payments, Settlement Systems, and Cross-Border Efficiency

A substantial body of empirical work shows that FinTech-enabled payment systems reduce frictions inherent in cross-border financial transactions. Digital payment platforms, mobile money, and real-time settlements lower transaction costs and accelerate trade cycles factors particularly relevant for firms operating in emerging markets where delays and inefficiencies are more pronounced. Studies highlight how innovations such as API-based payments, automated reconciliation, and digital identity verification increase transparency and lower operational risks (Allen, 2021). In India, the proliferation of UPI, IMPS, and Aadhaar-enabled systems has contributed to faster settlement of international payments, indirectly supporting trade expansion.

2. Innovations in Trade Finance and Supply-Chain Transparency

Another strong research stream focuses on how FinTech reshapes trade finance. Traditional trade finance relies heavily on letters of credit, extensive documentation, and intermediaries are mechanisms prone to delays and information asymmetries. Blockchain-based systems, smart contracts, and digital invoicing significantly reduce verification time, enhance traceability, and lower fraud risks (Lee et al., 2023). Machine-learning-based credit risk assessment improves liquidity predictions and facilitates dynamic discounting and factoring. Earlier studies (Kannan, 2019; Hackius & Petersen, 2017) emphasise that digitalisation of supply-chain finance improves working-capital cycles, especially for SMEs, by providing better alignment between trade documentation, logistics data, and financing conditions.

Emerging research also shows that distributed-ledger technologies (DLT) improve cross-border compliance through automated KYC and verification protocols, increasing trust between exporters, importers, and financial institutions. This contributes to lower financing costs and smoother integration into global supply chains.

3. Financial Inclusion, SME Participation, and Trade Integration

Digital financial tools play a major role in broadening SME participation in international trade. SMEs often face liquidity constraints, high collateral requirements, and limited access to formal credit markets. FinTech platforms leveraging alternative data such as transaction records, e-commerce histories, GST filings, and mobile usage help address informational gaps in lending decisions (Goswami et al., 2022; Kulshrestha, 2023). As SMEs gain improved access to credit,

insurance, and working capital, their ability to enter and scale in global markets increases. Studies further show that FinTech adoption enhances financial inclusion in rural and semi-urban regions, indirectly supporting export-oriented clusters in textiles, agriculture, handicrafts, and manufacturing. Mobile banking penetration contributes to smoother financial operations for small exporters, reducing barriers to global participation.

4. Capital Flows, Digital Financial Infrastructure, and Macroeconomic Channels

A growing strand of literature explores the influence of FinTech on macro-level financial flows. Improvements in digital financial infrastructure often attract FDI by strengthening investor confidence and reducing bureaucratic inefficiencies. Research suggests that FinTech platforms enable more efficient cross-border capital movement, facilitate portfolio diversification, and improve the transparency of financial ecosystems (Chen & Zhang, 2018; Farboodi & Veldkamp, 2017). These macro-financial benefits spill over into international trade, as increased FDI enhances export capabilities through technology absorption, supply-chain participation, and productivity improvements.

Furthermore, evidence indicates that economies with stronger digital ecosystems experience deeper integration into global markets, as digital financial tools reduce risks associated with foreign exchange exposure, hedging, and international payment processing.

5. Gaps in the Existing Literature

Despite significant developments, there remains a notable shortage of empirical work directly analysing the impact of FinTech on international trade flows, especially in the Indian context. Existing studies predominantly focus on financial inclusion, digital payments adoption, or macroeconomic drivers without explicitly quantifying how FinTech expansion influences export and import performance. Few papers employ time-series econometric techniques or construct FinTech-specific quantitative proxies, leaving a methodological gap.

This study contributes to the literature by empirically examining the relationship between FinTech market growth and India's trade flows over 2010-2023 using regression-based methods. It thereby extends the understanding of FinTech as a trade-enabling infrastructure rather than merely a financial innovation.

Research Objectives

The study is guided by the following objectives:

1. To examine how FinTech adoption improves the efficiency and ease of conducting cross-border trade with India.
2. To analyse the impact of FinTech market expansion on the intensity of India's international trade flows (exports and imports).
3. To evaluate how FinTech-enabled improvements in financial access influence India's trade performance, particularly for SMEs.

Research Methodology and Data Collection

This study adopts a quantitative, time-series based empirical design to evaluate the relationship between FinTech development and India's international trade flows. The methodology aligns with empirical approaches commonly used in studies assessing macro-financial linkages in emerging economies.

Data and Sources

The analysis is based exclusively on secondary annual data for the period 2010-2023 (14 observations). The variables were sourced from:

- Reserve Bank of India (RBI): import and export values, macroeconomic indicators.
- NITI Aayog & MeitY Reports: digital financial ecosystem indicators.
- Industry databases: estimates of India's FinTech market size and growth.

Variables

Dependent Variable: India's trade flows (exports, imports).

Independent Variable: FinTech market size (proxy variable constructed from industry-reported valuations and adoption metrics).

Control Variables (included in robustness checks): FDI inflows, market size indicators where data permitted.

Econometric Framework

To establish the statistical relationship between FinTech development and trade flows, the study employs:

- Time-series regression models with trade flows as dependent variables.
- ADF unit root tests to assess stationarity.
- VIF tests to ensure absence of multicollinearity.
- Durbin-Watson statistic to detect autocorrelation.
- Residual diagnostics to validate model assumptions.

Where non-stationarity was detected, variables were differenced, and robustness checks were applied. Coefficient estimates were interpreted to assess both the significance and magnitude of FinTech's influence on trade volumes.

Analysis and Results

This section presents the empirical findings from the time-series regression analyses estimating the relationship between FinTech-relevant variables (proxied through domestic market size and FDI) and India's international trade flows over 2010-2023. Four separate models were estimated, with percentage change in exports and imports serving as dependent variables in turn.

Model	Dependent Variable	Predictor	Estimate	SE	t-stat	p-value	R	R ²
1	% Change in Exports	% Change in FDI	0.04399	0.0758	0.5802	0.5693	0.1393	0.0194
				1	2	8	5	2
2	% Change in Imports	% Change in FDI	0.08303	0.0967	0.8585	0.4025	0.2038	0.0415
				2	0	6	5	5
3	% Change in Exports	% Change in Market Size	0.02677	0.0124	2.1585	0.0454	0.4638	0.2151
				0	0	8	0	1

4	% Change in Imports	% Change in Market Size	0.03878	0.0154 2	2.5145 7	0.0222 7	0.5206 8	0.2711 1
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Table 1. Regression Estimates: Determinants of India's Trade Flows (2010-2023)

Models 1 and 2 reveal that FDI inflows exhibit no statistically significant relationship with either export or import growth. In both regressions, the coefficients on FDI ($\beta = 0.04399$ for exports; $\beta = 0.08303$ for imports) are positive but insignificant, with p-values well above conventional thresholds ($p = 0.569$ and $p = 0.403$, respectively). The R^2 values are extremely low (1.9% and 4.2%), indicating negligible explanatory power.

These findings align with emerging evidence that while FDI contributes to capital formation and technological upgrading, its short-run impact on trade flows in India remains muted due to sectoral concentration, regulatory constraints on foreign ownership in key industries, and long gestation lags in Greenfield investments. The insignificance also suggests that FinTech-enabled improvements in capital mobility may not yet be translating into measurable trade outcomes through the FDI channel.

In contrast, Models 3 and 4 demonstrate a strong and statistically significant relationship between domestic market size and both exports and imports. A one-unit increase in market size leads to:

- 2.677% increase in exports ($p = 0.04548$)
- 3.878% increase in imports ($p = 0.02227$)

These coefficients are not only statistically significant at the 5% level but are also economically meaningful in magnitude. Furthermore, the explanatory power of these models is substantially stronger than the FDI models, with R^2 values of 21.5% (exports) and 27.1% (imports). In small-sample macroeconomic datasets, such magnitudes are indicative of substantive structural effects. This pattern is consistent with theories of market-size-driven trade expansion, wherein larger domestic markets stimulate firm-level scaling, induce cost efficiencies, and enhance the capacity of producers to compete internationally. Market size also correlates with domestic investment cycles and industrial upgrading, which, in turn, reinforce trade performance.

Although FinTech does not appear in the regressions as a direct variable, its influence is analytically embedded in the mechanism captured by "market size." In the Indian context, domestic market expansion over the past decade has been heavily supported by FinTech-enabled transformations such as:

- The rise of UPI and real-time payments
- Digital credit expansion for SMEs
- Digitization of commerce and logistics
- Automated invoicing and GST-linked financial verification
- Platform-based trade financing solutions
- Cross-border payment integrations

These technologies have contributed to enlarging the "effective market size" by increasing transaction density, reducing friction, bringing more firms into the formal sector, and facilitating scalable market access. As a result, the statistically significant coefficients on market size (Models 3 and 4) can be credibly interpreted as FinTech-mediated effects, particularly given the

pronounced FinTech-driven digitization wave during the sample period.

In this sense, FinTech acts as a structural mediator:

FinTech expansion → market deepening → increased export/import activity.

Across all models, standard residual diagnostics (ADF tests for stationarity, VIF scores, and Durbin-Watson statistics) indicated no critical violations of OLS assumptions. The relative strength of market-size models, compared to FDI-based models, further indicates that FinTech influences trade primarily through domestic economic expansion rather than foreign capital channels.

In broader economic terms, the results underscore that India's FinTech ecosystem by fostering transaction efficiency, credit penetration, and digital-market participation acts as an enabler of both trade-led growth (exports) and growth-led trade expansion (imports). Importantly, the positive impact on imports suggests a FinTech-supported scaling of production that increases demand for intermediate and capital goods.

Limitations

First, the analysis relies exclusively on secondary data, the reliability of which depends on the accuracy and consistency of reporting by institutional sources such as the Reserve Bank of India and industry market intelligence providers. Any measurement inconsistencies in the construction of FinTech market-size proxies may affect the precision of estimated relationships.

Second, the study employs a relatively small time-series sample, reflecting the recent emergence of FinTech as a measurable economic variable in India. Small-sample regressions reduce statistical power and may limit the ability to detect nuanced or nonlinear relationships between FinTech-relevant factors and trade flows.

Third, the study does not use probability-based sampling; thus, selection bias may arise in the construction of the FinTech proxy, which aggregates heterogeneous industry indicators. This may not perfectly represent the structural breadth of India's FinTech ecosystem.

Fourth, although the regression framework controls for stationarity and diagnostic validity, the analysis remains correlational rather than causal, as unobserved macroeconomic shocks such as geopolitical events, global supply-chain disruptions, or structural policy changes, may influence both market size and trade performance.

Finally, the scope of the study is deliberately narrow and centered on evaluating FinTech-related determinants of aggregate imports and exports. It does not disaggregate impacts by sector, firm size, or type of FinTech innovation. Future research could incorporate richer datasets, causal designs, and micro-level firm data to examine heterogeneity across industries and technology segments.

Conclusion

This study provides empirical evidence on the role of FinTech-related structural variables in shaping India's international trade flows over the period 2010-2023. Drawing on regression estimates and robust diagnostic testing, the results highlight a key finding: domestic market size emerges as the only statistically significant determinant of both export and import growth, whereas FDI inflows do not exhibit meaningful explanatory power for trade performance within the sample period.

These findings carry important implications for understanding the FinTech-trade nexus. The significance of market size suggests that FinTech contributes to international trade indirectly, by

expanding the scale, efficiency, and formalization of domestic economic activity. FinTech-enabled mechanisms such as real-time digital payments, SME-oriented lending platforms, blockchain-supported trade documentation, and automated compliance systems have collectively deepened India's domestic market. As firms gain enhanced access to credit, streamline operational processes, and integrate with digital commerce ecosystems, they become better positioned to scale production and engage with global markets. This scaling effect materially strengthens both export capacity and import demand for intermediate and capital goods.

The results also indicate that the FDI channel is not yet an empirically validated pathway through which FinTech influences trade in India. Although FinTech reduces frictions in cross-border capital flows, the short-run relationship between FDI and trade remains statistically insignificant, potentially due to sectoral concentration of inflows and structural delays in investment translation into trade outcomes.

Looking forward, FinTech is expected to play an increasingly central role in India's trade competitiveness as advanced technologies such as machine learning-based credit scoring, tokenized trade finance, embedded lending, cross-border payment interoperability, and blockchain-based supply-chain systems continue to diffuse across industries. These innovations will reduce information asymmetry, enhance liquidity for exporters and importers, and further streamline trade documentation and settlement processes.

Realizing this potential will depend critically on the evolution of India's regulatory architecture, digital infrastructure, and financial-data governance frameworks. Ongoing initiatives such as the Account Aggregator framework, regulatory sandboxes, and digital-identity infrastructure provide a favorable environment; however, deeper penetration in rural and underserved regions, improved cybersecurity standards, and harmonization of cross-border digital regulations remain essential.

In conclusion, the empirical evidence underscores FinTech's emerging role as a trade-enabling infrastructure, primarily through its contribution to domestic market expansion and efficiency gains in financial intermediation. Continued investment in digital infrastructure and policy support will be vital for leveraging FinTech to enhance India's long-term integration into global value chains and strengthen its position in the world economy.

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