

**India's BRICS 2026 Presidency: Reimagining Intra-BRICS Trade through Local Currency Settlement
and Digital Payment Interoperability**

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Research Manuscript and Advanced PLS-SEM Model Development Package

Prepared for further empirical development and submission to a Scopus-indexed journal

IMPORTANT RESEARCH-INTEGRITY NOTICE

This manuscript is designed as a publication-development draft. No claim of first-submission acceptance is possible, and no researcher can guarantee acceptance by a Scopus-indexed journal. The accompanying dataset is synthetic and is supplied solely to test the proposed SmartPLS/PLS-SEM model, reporting workflow, and analytical specification. It must not be presented as collected survey evidence. Before journal submission, genuine field data, ethics/consent documentation where applicable, validated measurement scales, preregistered or documented sampling procedures, and the resulting empirical output must replace the synthetic pilot layer.

Abstract

The expansion of BRICS and the growing policy emphasis on payment interoperability, local-currency settlement and trade facilitation create a timely research setting for examining how financial infrastructure may affect intra-BRICS trade from an Indian perspective. This study develops an India-centred empirical framework linking local currency settlement capability and digital payment interoperability to intra-BRICS trade expansion through foreign-exchange risk reduction, transaction-cost efficiency and trade facilitation capability, while positioning regulatory and institutional compatibility as a boundary condition. The proposed model integrates internationalisation-of-currency logic, transaction-cost economics, institutional theory and digital-platform perspectives. A reflective measurement design is specified for seven latent constructs and a PLS-SEM strategy is proposed using SmartPLS 4, including measurement-model assessment, HTMT, bootstrapped path coefficients, mediation, interaction effects, predictive assessment through PLSpredict, effect sizes, explained variance and measurement invariance where meaningful groups are compared. The framework responds to a gap in the literature: BRICS payment cooperation is frequently discussed at the policy level, while firm-level evidence on the mechanisms connecting settlement architecture and interoperable payment systems to trade outcomes remains comparatively underdeveloped. The paper therefore contributes a testable model rather than assuming that de-dollarisation or payment integration automatically produces trade expansion. The accompanying synthetic dataset demonstrates the proposed data structure and can be used to build the SmartPLS project, but it is explicitly not empirical evidence. The next research stage is collection of genuine responses from Indian exporters, importers, banks, fintech firms, logistics providers and trade-policy professionals with direct BRICS exposure.

Keywords

BRICS; India; local currency settlement; digital payment interoperability; UPI; intra-BRICS trade; transaction costs; foreign-exchange risk; PLS-SEM; SmartPLS; institutional compatibility; financial integration

1. Introduction

BRICS has evolved from a small coalition of major emerging economies into a substantially broader platform for economic and financial cooperation. The 2025 Rio de Janeiro declaration explicitly connected work on local-currency financing and the BRICS Cross-Border Payments Initiative with the objective of facilitating fast, low-cost, accessible, efficient, transparent and safe cross-border payments that can support trade and investment flows. It also linked payment cooperation with supply-chain resilience and stronger participation by micro, small and medium enterprises. [cite](#) [turn1search60](#)

For India, this agenda intersects with a domestic policy trajectory that combines local-currency settlement arrangements with the international expansion of digital payment infrastructure. RBI reporting notes that local-currency settlement can reduce exchange-rate exposure, transaction costs and settlement time, while its internationalisation work has considered UPI and other payment infrastructure as channels supporting cross-border transactions. [cite](#) [turn1search0](#) [turn1search13](#)

The contemporary relevance is heightened by the 2026 Indian BRICS chairship. Current reporting ahead of the New Delhi summit indicates that India is advocating greater cross-border payment interoperability, including discussion of linking central-bank digital currencies, while simultaneously emphasizing that the practical objective is smoother transactions rather than the creation of a single BRICS currency.

[cite](#) [turn0news70](#) [turn0news68](#)

The central research problem is therefore not whether BRICS should 'replace the dollar'. Such a binary framing risks overlooking the firm-level mechanisms through which settlement and payment architecture may influence trade. The more precise question is whether local-currency settlement and interoperable digital payments reduce frictions sufficiently to improve firms' perceived ability and willingness to expand intra-BRICS trade, and under what institutional conditions these effects become stronger or weaker.

Accordingly, this study proposes a mechanism-based model in which local currency settlement capability reduces foreign-exchange risk; digital payment interoperability improves transaction-cost efficiency; both mechanisms contribute to trade facilitation; and trade facilitation drives intra-BRICS trade expansion. Regulatory and institutional compatibility is modelled as a moderator because technical interoperability without compatible rules, compliance processes, dispute resolution, settlement arrangements and supervisory coordination may produce limited commercial value.

2. Research Objectives

- To conceptualise the relationship between local currency settlement capability, digital payment interoperability and intra-BRICS trade expansion from an Indian perspective.
- To examine whether foreign-exchange risk reduction and transaction-cost efficiency mediate the relationship between financial-payment mechanisms and trade facilitation.
- To assess the role of regulatory and institutional compatibility as a moderator of the payment-to-trade relationship.
- To develop and empirically validate a higher-rigor PLS-SEM model suitable for firm-level evidence from India.
- To evaluate both explanatory and predictive performance rather than relying only on significance tests.

3. Research Questions

- RQ1: How strongly are local currency settlement capability and digital payment interoperability associated with intra-BRICS trade expansion?
- RQ2: Do foreign-exchange risk reduction and transaction-cost efficiency explain these relationships?
- RQ3: Does trade facilitation capability transmit the effects of payment/settlement mechanisms to trade expansion?
- RQ4: Does regulatory and institutional compatibility strengthen or weaken these relationships?
- RQ5: Does the proposed model provide meaningful out-of-sample predictive value?

4. Theoretical Foundation

4.1 Transaction Cost Economics

Transaction-cost economics suggests that firms organise cross-border exchanges partly in response to costs associated with searching, contracting, monitoring, settlement and safeguarding transactions. Cross-border payments can add intermediary fees, delays, foreign-exchange conversion costs and reconciliation burdens. Local-currency settlement and interoperable payment rails may therefore affect trade not because they remove all currency risk, but because they alter the cost architecture of repeated transactions.

4.2 Institutional Theory

Payment interoperability is not purely a technical problem. Firms operate within legal, regulatory and institutional environments governing foreign exchange, anti-money-laundering controls, data governance, payment finality, consumer protection and dispute resolution. Regulatory and institutional compatibility is therefore positioned as a moderator that can condition whether technical capabilities translate into commercially usable trade infrastructure.

4.3 Digital Platform Perspective

Digital payment interoperability creates value when separate payment systems can communicate with sufficient reliability, accessibility and standardisation. India's experience with UPI linkages illustrates the policy logic: RBI has pursued bilateral fast-payment connectivity and joined Project Nexus to support multilateral interlinking of domestic fast-payment systems. [□ cite □ turn l search6 □](#)

4.4 Internationalisation of the Rupee

The proposed framework treats local-currency settlement as an operational trade mechanism rather than equating it with a wholesale replacement of the US dollar. RBI's annual reporting states that LCS arrangements allow traders to invoice and pay in domestic currencies and can reduce exchange-rate exposure, transaction costs and settlement time. [□ cite □ turn l search0 □](#)

5. Conceptual Model

The model contains seven latent constructs: Local Currency Settlement Capability (LCS), Digital Payment Interoperability (DPI), Foreign-Exchange Risk Reduction (FXR), Transaction-Cost Efficiency (TCE), Trade Facilitation Capability (TFC), Regulatory and Institutional Compatibility (RCR), and Intra-BRICS Trade Expansion (IBTE). LCS and DPI are exogenous constructs; FXR and TCE are mechanism constructs; TFC is a proximal mediator; RCR is a moderator; and IBTE is the focal endogenous outcome.

Construct	Role	Proposed indicators	Logic
LCS	Exogenous	4 reflective items	Ability to invoice/settle trade in local currencies
DPI	Exogenous	5 reflective items	Interoperability, speed, access, reliability and integration
FXR	Mediator	4 reflective items	Perceived reduction in currency-conversion/exposure frictions
TCE	Mediator	4 reflective items	Lower cost, delay, reconciliation and processing burden
TFC	Mediator	4 reflective items	Ease, predictability and execution of cross-border trade
RCR	Moderator	4 reflective items	Regulatory, institutional and compliance compatibility
IBTE	Endogenous	4 reflective items	Expected/observed ability to expand intra-BRICS trade

Core structural specification: $LCS \rightarrow FXR \rightarrow TFC \rightarrow IBTE$; $DPI \rightarrow TCE \rightarrow TFC \rightarrow IBTE$. Direct paths from LCS and DPI to IBTE are retained to test partial mediation. Moderation paths $LCS \times RCR \rightarrow TFC$ and $DPI \times RCR \rightarrow TFC$ assess whether institutional compatibility conditions the mechanisms.

6. Hypotheses Development

Hypothesis	Statement	Path
H1	Local Currency Settlement Capability positively influences Foreign-Exchange Risk Reduction.	$LCS \rightarrow FXR$
H2	Digital Payment Interoperability positively influences Transaction-Cost Efficiency.	$DPI \rightarrow TCE$
H3	Foreign-Exchange Risk Reduction positively influences Trade Facilitation Capability.	$FXR \rightarrow TFC$
H4	Transaction-Cost Efficiency positively influences Trade Facilitation Capability.	$TCE \rightarrow TFC$
H5	Trade Facilitation Capability positively influences Intra-BRICS Trade Expansion.	$TFC \rightarrow IBTE$
H6	Local Currency Settlement Capability positively influences Intra-BRICS Trade Expansion.	$LCS \rightarrow IBTE$
H7	Digital Payment Interoperability positively influences Intra-BRICS Trade Expansion.	$DPI \rightarrow IBTE$
H8	Regulatory and Institutional Compatibility positively moderates the relationship between Local Currency Settlement Capability and Trade Facilitation Capability.	$LCS \times RCR \rightarrow TFC$
H9	Regulatory and Institutional Compatibility positively moderates the relationship between Digital Payment Interoperability and Trade Facilitation Capability.	$DPI \times RCR \rightarrow TFC$

7. Methodology

A cross-sectional, explanatory survey design is proposed. The target population should comprise Indian professionals with direct experience in international trade, trade finance, banking, fintech/payments, logistics, export-import operations, consulting or policy/regulatory functions involving BRICS markets. Screening questions should confirm that respondents have meaningful exposure to cross-border trade or payment processes.

The preferred empirical sample is 450–600 valid observations. The final sample size should be determined using an a priori power analysis and the expected smallest structural effect, rather than the outdated '10-times

rule'. SmartPLS documentation specifically notes that the 10-times rule is not a reliable basis for sample-size determination and recommends more rigorous power approaches. [cite](#) [turn0search6](#) [turn0search3](#)

Sampling should combine purposive screening with controlled quota coverage across sectors and firm sizes. Where possible, respondents should be recruited through exporter associations, chambers, banking/trade-finance networks, fintech associations and professional networks. Data-quality controls should include attention checks, completion-time screening, duplicate detection, straight-line response diagnostics and Mahalanobis-distance review where appropriate.

7.1 Measurement design

All focal constructs are specified reflectively for the initial model. Items should be adapted from validated literature where possible and then reviewed by subject-matter experts. A pilot of approximately 30–50 qualified respondents should be used to assess wording, response distributions and preliminary reliability; pilot observations should not automatically be pooled with the main sample.

7.2 Questionnaire scale

A seven-point Likert scale is proposed (1 = strongly disagree; 7 = strongly agree). Each construct contains 4–5 indicators. The final instrument should include screening questions, respondent profile variables, BRICS exposure, the validated/adapted construct items, attention checks and a concise informed-consent statement.

7.3 Common method bias controls

Procedural remedies should include anonymity, neutral wording, separation of predictor and criterion sections, randomisation where appropriate, and clear statements that there are no right or wrong answers. Statistical diagnostics may include full-collinearity VIF as a screening indicator, but no single statistical test should be treated as definitive proof that common-method bias is absent.

8. SmartPLS 4 Analysis Protocol

The analysis should proceed in a pre-specified sequence rather than selecting methods after observing results.

- Data screening: missingness, duplicates, completion time, attention checks, response distributions and outliers.
- Measurement model: indicator loadings, internal consistency reliability, convergent validity and discriminant validity.
- Discriminant validity: prioritise HTMT and bootstrap inference. SmartPLS recommends HTMT and notes that values below 0.90 are commonly used as evidence of discriminant validity. [cite](#) [turn0search4](#)
- Collinearity: inspect inner VIF before interpreting structural paths.
- Structural model: path coefficients, bootstrap confidence intervals, t-statistics/p-values, effect sizes (f^2), R^2 and predictive relevance where applicable.
- Mediation: estimate specific indirect effects and bootstrap confidence intervals; distinguish complementary, indirect-only, direct-only and no-effect patterns.
- Moderation: estimate interaction terms and probe conditional effects at low, medium and high levels of regulatory compatibility.
- Prediction: use PLSpredict to assess out-of-sample predictive performance. SmartPLS describes PLSpredict as a k-fold holdout procedure that evaluates prediction errors such as RMSE and MAE. [cite](#) [turn0search7](#)

- Robustness: compare PLS-SEM with PLS_c where theoretically appropriate; test alternative specifications; inspect influential cases; and report whether conclusions change.
- Multi-group analysis: if meaningful groups such as exporters vs. service firms or high vs. low BRICS exposure are compared, establish measurement invariance using MICOM before interpreting group differences. [□cite□turn0search0□](#)

9. Proposed Measurement Model and Item Blueprint

Indicator	Construct	Mode	Scale
LCS1	Local Currency Settlement Capability	Reflective	7-point Likert
LCS2	Local Currency Settlement Capability	Reflective	7-point Likert
LCS3	Local Currency Settlement Capability	Reflective	7-point Likert
LCS4	Local Currency Settlement Capability	Reflective	7-point Likert
DPI1	Digital Payment Interoperability	Reflective	7-point Likert
DPI2	Digital Payment Interoperability	Reflective	7-point Likert
DPI3	Digital Payment Interoperability	Reflective	7-point Likert
DPI4	Digital Payment Interoperability	Reflective	7-point Likert
DPI5	Digital Payment Interoperability	Reflective	7-point Likert
FXR1	Foreign-Exchange Risk Reduction	Reflective	7-point Likert
FXR2	Foreign-Exchange Risk Reduction	Reflective	7-point Likert
FXR3	Foreign-Exchange Risk Reduction	Reflective	7-point Likert
FXR4	Foreign-Exchange Risk Reduction	Reflective	7-point Likert
TCE1	Transaction-Cost Efficiency	Reflective	7-point Likert
TCE2	Transaction-Cost Efficiency	Reflective	7-point Likert
TCE3	Transaction-Cost Efficiency	Reflective	7-point Likert
TCE4	Transaction-Cost Efficiency	Reflective	7-point Likert
TFC1	Trade Facilitation Capability	Reflective	7-point Likert
TFC2	Trade Facilitation Capability	Reflective	7-point Likert
TFC3	Trade Facilitation Capability	Reflective	7-point Likert
TFC4	Trade Facilitation Capability	Reflective	7-point Likert

RCR1	Regulatory & Institutional Compatibility	Reflective	7-point Likert
RCR2	Regulatory & Institutional Compatibility	Reflective	7-point Likert
RCR3	Regulatory & Institutional Compatibility	Reflective	7-point Likert
RCR4	Regulatory & Institutional Compatibility	Reflective	7-point Likert
IBTE1	Intra-BRICS Trade Expansion	Reflective	7-point Likert
IBTE2	Intra-BRICS Trade Expansion	Reflective	7-point Likert
IBTE3	Intra-BRICS Trade Expansion	Reflective	7-point Likert
IBTE4	Intra-BRICS Trade Expansion	Reflective	7-point Likert

10. Data Analysis Reporting Template

The following tables are designed to be populated only after genuine data collection. Numerical values must come directly from SmartPLS output; they should not be back-filled to fit the hypotheses.

Table	Required output	Decision rule / interpretation
Table 1	Sample profile	Report valid N, sectors, firm size, experience and BRICS exposure.
Table 2	Indicator loadings	Retain strong indicators; investigate weak loadings using theory and measurement quality.
Table 3	Reliability & convergent validity	Report α , ρ_A , composite reliability and AVE.
Table 4	HTMT / HTMT inference	Use HTMT and bootstrap confidence intervals.
Table 5	Structural paths	β , SD, t, p, CI, f^2 and decision on H1–H9.
Table 6	Mediation	Specific indirect effects and total effects.
Table 7	Moderation	Interaction coefficient and simple-slope/conditional-effect interpretation.
Table 8	Predictive performance	PLSpredict RMSE/MAE versus LM benchmark.
Table 9	MGA/MICOM	Only for substantively justified groups.

11. Expected Theoretical Contribution

The first contribution is a mechanism-based account of how payment architecture may influence trade. Instead of treating local-currency settlement and digital payments as synonymous with de-dollarisation, the model separates exchange-rate risk reduction and transaction-cost efficiency as distinct channels.

The second contribution is institutional. The model predicts that payment technology alone is insufficient: regulatory and institutional compatibility should shape the extent to which technical connectivity becomes usable trade infrastructure.

The third contribution is methodological. The proposed research goes beyond coefficient significance by integrating mediation, moderation, predictive assessment and, where appropriate, measurement invariance. This is consistent with contemporary SmartPLS guidance, which provides dedicated procedures for HTMT, MICOM, prediction and statistical power. [cite](#) [turn0search0](#) [turn0search7](#) [turn0search3](#)

The fourth contribution is policy-oriented. The framework can help distinguish between symbolic cooperation and commercially consequential integration by identifying the mechanisms most strongly associated with trade expansion.

12. Policy Implications

- Prioritise interoperability standards and settlement connectivity rather than framing BRICS cooperation only around a common currency.
- Strengthen local-currency settlement liquidity, hedging mechanisms and transparent pricing so that firms can manage residual currency risk.
- Design cross-border payment links with MSMEs in mind, including low-value transaction economics, onboarding simplicity and predictable compliance procedures.
- Develop common or mutually recognised technical and compliance standards while preserving national regulatory authority.
- Use pilot corridors and measurable transaction-cost, settlement-time and trade-flow indicators to evaluate whether payment initiatives generate commercial benefits.
- Maintain interoperability with the wider international financial system; diversification of settlement channels need not imply exclusion of existing global payment networks.

13. Limitations and Future Research

The proposed design is cross-sectional and primarily perceptual; causal inference will therefore remain limited. Future work should combine survey evidence with transaction-level or bilateral trade data, including settlement currency, payment cost, settlement time, exchange-rate volatility and firm-level export/import outcomes.

A longitudinal design could assess whether policy implementation produces changes in trade behaviour after payment links become operational. Multi-country samples could also test whether the proposed relationships generalise beyond India and whether institutional differences produce meaningful heterogeneity.

Because the present development dataset is synthetic, it cannot establish the hypotheses. The empirical paper should be rewritten after genuine fieldwork and SmartPLS estimation, with all numerical claims tied to the actual data and reproducible outputs.

14. Conclusion

India's BRICS 2026 presidency creates an unusually relevant setting for studying the interface between trade, currency settlement and digital payment infrastructure. The policy evidence already demonstrates that BRICS members are discussing local-currency financing and payment interoperability, while India's domestic policy architecture provides concrete examples of local-currency settlement and cross-border payment connectivity.

□cite□turnlsearch60□turnlsearch0□turnlsearch6□

The proposed model advances the debate by asking how and under what conditions such infrastructure can translate into trade outcomes. Its central proposition is deliberately testable: settlement capability and payment interoperability should influence trade expansion through identifiable economic mechanisms, with institutional compatibility determining how effectively those mechanisms operate.

The research should therefore be positioned as an empirical test of a carefully specified mechanism model—not as evidence that BRICS payment integration automatically produces de-dollarisation or trade expansion.

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Appendix A. Proposed Survey Instrument

LCS — Local Currency Settlement Capability

LCS1. [Insert validated/adapted item wording after scale-source review].

LCS2. [Insert validated/adapted item wording after scale-source review].
LCS3. [Insert validated/adapted item wording after scale-source review].
LCS4. [Insert validated/adapted item wording after scale-source review].

DPI — Digital Payment Interoperability

DPI1. [Insert validated/adapted item wording after scale-source review].
DPI2. [Insert validated/adapted item wording after scale-source review].
DPI3. [Insert validated/adapted item wording after scale-source review].
DPI4. [Insert validated/adapted item wording after scale-source review].
DPI5. [Insert validated/adapted item wording after scale-source review].

FXR — Foreign-Exchange Risk Reduction

FXR1. [Insert validated/adapted item wording after scale-source review].
FXR2. [Insert validated/adapted item wording after scale-source review].
FXR3. [Insert validated/adapted item wording after scale-source review].
FXR4. [Insert validated/adapted item wording after scale-source review].

TCE — Transaction-Cost Efficiency

TCE1. [Insert validated/adapted item wording after scale-source review].
TCE2. [Insert validated/adapted item wording after scale-source review].
TCE3. [Insert validated/adapted item wording after scale-source review].
TCE4. [Insert validated/adapted item wording after scale-source review].

TFC — Trade Facilitation Capability

TFC1. [Insert validated/adapted item wording after scale-source review].
TFC2. [Insert validated/adapted item wording after scale-source review].
TFC3. [Insert validated/adapted item wording after scale-source review].
TFC4. [Insert validated/adapted item wording after scale-source review].

RCR — Regulatory & Institutional Compatibility

RCR1. [Insert validated/adapted item wording after scale-source review].
RCR2. [Insert validated/adapted item wording after scale-source review].
RCR3. [Insert validated/adapted item wording after scale-source review].
RCR4. [Insert validated/adapted item wording after scale-source review].

IBTE — Intra-BRICS Trade Expansion

IBTE1. [Insert validated/adapted item wording after scale-source review].
IBTE2. [Insert validated/adapted item wording after scale-source review].
IBTE3. [Insert validated/adapted item wording after scale-source review].

IBTE4. [Insert validated/adapted item wording after scale-source review].

Response scale: 1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Neutral; 5 = Somewhat agree; 6 = Agree; 7 = Strongly agree.

Appendix B. Synthetic Dataset Notice

The accompanying Excel workbook contains 500 synthetic observations generated solely for demonstrating the intended variable structure and SmartPLS workflow. The synthetic data should not be described as a survey, should not be submitted as empirical evidence, and should not be used to claim statistical findings about Indian firms or BRICS trade.

For a journal submission, replace the workbook with genuine observations and preserve a reproducible data dictionary, codebook, sampling log, exclusion log and SmartPLS project/report.