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Financing a Fragmenting World: Bank-Intermediated Trade Finance Supply, Geopolitical Alignment, and Export Performance in Emerging Market and Developing Economies, 2012–2025

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Abstract

Roughly four-fifths of merchandise trade depends on some form of credit, guarantee, or insurance, yet the supply of bank-intermediated trade finance is highly concentrated, geographically specialised, and increasingly exposed to geopolitical risk. This study asks whether the availability of bank-intermediated trade finance causally shapes the export performance of emerging market and developing economies (EMDEs), and whether that relationship is being reorganised along lines of geopolitical alignment. Drawing on the theory of payment-contract choice under imperfect contract enforcement (Schmidt-Eisenlohr, 2013) and on heterogeneous-firm models with credit constraints (Manova, 2013; Melitz, 2003), the paper develops a structural gravity framework in which trade finance supply enters as a bilateral, time-varying cost-and-risk shifter. The empirical design combines country-pair trade flows with measures of letter-of-credit and correspondent banking capacity, and identifies supply-side variation using a shift-share instrument constructed from pre-period bank–corridor exposures interacted with idiosyncratic shocks to individual global trade finance banks, following the logic of Khwaja and Mian (2008) and Paravisini et al. (2015). Geopolitical alignment is measured using United Nations General Assembly ideal-point distance (Bailey et al., 2017). Estimation proceeds via Poisson pseudo-maximum likelihood with three-way high-dimensional fixed effects (Correia et al., 2020; Santos Silva & Tenreiro, 2006). The paper sets out the analysis protocol, hypotheses, identification strategy, robustness architecture, and result-reporting templates, and specifies falsifiable priors drawn from the existing literature. It contributes a bridge between the trade finance literature, which has largely treated bank supply shocks as apolitical, and the geoeconomic fragmentation literature, which has largely ignored the financial plumbing through which fragmentation is transmitted.

Keywords: - Trade Finance, Letters of Credit, Geoeconomic Fragmentation, Correspondent Banking, De-Risking, Structural Gravity, PPML, Emerging Markets, SME Finance, Trade Digitalisation

I. INTRODUCTION

1.1. Background and Motivation

International trade is a financial transaction before it is a physical one. Between the moment an exporter commits inputs to production and the moment payment clears, someone must bear both a financing cost and a counterparty risk, and the allocation of those burdens between exporter, importer, and third-party banks is the substance of what practitioners call trade finance (Schmidt-Eisenlohr, 2013). When that intermediation functions, it is invisible. When it fails, trade falls faster than output, which is the defining stylised fact of the 2008–2009 collapse, in which the ratio of trade to GDP contracted far more sharply than demand-side models alone could explain (Amiti & Weinstein, 2011; Bems et al., 2013).

Two developments make a reappraisal urgent. First, the shortfall in trade finance provision has proved structural rather than cyclical. The Asian Development Bank's ninth global survey estimates unmet demand for trade finance at approximately

USD 2.5 trillion, or around one-tenth of global trade, unchanged in absolute terms from the previous survey round, with small and medium-sized enterprises (SMEs) and firms in low-income jurisdictions disproportionately rationed (Asian Development Bank, 2023, 2025). Second, the geography of financial intermediation is being redrawn. Policy-driven geoeconomic fragmentation is reshaping trade, capital flows, and technology diffusion along bloc lines (Aiyar et al., 2023), while supply chains show early evidence of reallocation towards geopolitically proximate partners (Alfaro & Chor, 2023). Simultaneously, and largely for regulatory rather than geopolitical reasons, the correspondent banking network that carries cross-border payments has contracted and concentrated, with the sharpest withdrawals falling on smaller and poorer jurisdictions (Bank for International Settlements, 2019; Financial Stability Board, 2017; World Bank Group, 2015).

These two developments are usually studied apart. The trade finance literature treats bank supply shocks as essentially apolitical, the product of balance-sheet distress, funding conditions, or compliance economics (Niepmann & Schmidt-Eisenlohr, 2017b; Paravisini et al., 2015). The fragmentation literature, conversely, models tariffs, export controls, and investment screening while treating the payment and guarantee infrastructure as a frictionless background condition (Aiyar et al., 2023). If, however, the supply of letters of credit and correspondent services is itself being reorganised along geopolitical lines, then fragmentation possesses a financial transmission channel that operates faster than tariff policy, is invisible in trade-policy databases, and falls hardest on the countries least able to self-insure.

1.2. Problem Statement

The core problem this study addresses is that we do not know whether the well-documented causal effect of trade finance supply on exports is stable with respect to geopolitical alignment. If the elasticity of exports to trade finance supply is invariant to alignment, then fragmentation and financial retrenchment are separate policy problems requiring separate instruments. If the elasticity is conditional, being larger for geopolitically distant pairs, or if supply itself is withdrawing along alignment lines, then trade finance becomes an instrument of geoeconomic influence, and the multilateral development banks' facilitation programmes are functioning not merely as market-failure correctives but as a *de facto* neutrality infrastructure.

1.3. Research Objectives

- To estimate the causal elasticity of EMDE bilateral exports with respect to exogenous shocks to bank-intermediated trade finance supply, for the period 2012–2025.
- To test whether that elasticity is moderated by bilateral geopolitical alignment.
- To test whether the effect is amplified in sectors that are financially vulnerable and contract-intensive.
- To assess whether legal adoption of electronic trade documentation and the presence of multilateral development bank (MDB) trade facilitation programmes attenuate the estimated effects.
- To derive policy implications for EMDE regulators, MDBs, and standard-setting bodies.

1.4. Research Questions

- RQ1. Do exogenous contractions in the supply of bank-intermediated trade finance reduce EMDE bilateral exports, and by how much?
- RQ2. Does bilateral geopolitical distance moderate the export elasticity to trade finance supply?
- RQ3. Is the effect concentrated in financially vulnerable and contract-intensive sectors?
- RQ4. Do trade digitalisation reforms and MDB risk-sharing programmes attenuate the effect?

II. LITERATURE REVIEW

2.1. Review Protocol

To make the review reproducible, a structured search was conducted across EconLit, Scopus, Web of Science, RePEc/IDEAS, SSRN, and the working paper series of the IMF, World Bank, BIS, WTO, and ADB. The search string combined three blocks: (a) "trade finance" OR "letter of credit" OR "trade credit" OR "export credit" OR "correspondent banking"; (b) export OR trade OR "trade flows" OR gravity; and (c) fragmentation OR geopolitic\ OR "de-risking" OR sanctions OR alignment*. Blocks (a) AND (b) were required; block (c) was used for the fragmentation sub-corpus. The window was 1998 to 2026, with 1998 chosen because Rajan and Zingales (1998) established the external-finance-dependence measure that structures much of the subsequent sectoral literature. Inclusion criteria were: peer-reviewed articles or working papers from recognised institutional series; empirical or formal-theoretical content; and identification of a finance-to-trade mechanism. Excluded were practitioner commentaries without data, and studies of domestic trade credit with no cross-border dimension. Backward and forward citation chaining was applied to the ten most-cited retained items. The review is organised thematically below rather than chronologically, because the field's key divisions are mechanistic rather than temporal. A PRISMA-style record of identification, screening, eligibility, and inclusion counts was maintained throughout, together with a synthesis matrix cross-tabulating each retained study by mechanism, identification strategy, data level, period, and geography. Screening was conducted independently by two reviewers, with disagreements resolved by discussion and inter-rater agreement reported as Cohen's kappa.

2.2. Finance, Firm Heterogeneity, and the Pattern of Trade

The foundation is the heterogeneous-firm model, in which only sufficiently productive firms can cover the fixed costs of exporting (Melitz, 2003). Introducing credit constraints changes both the level and the composition of trade: financially developed countries acquire comparative advantage in financially vulnerable sectors, and credit frictions operate on both the extensive and intensive margins (Manova, 2013). Sectoral vulnerability is conventionally proxied by external finance dependence and asset tangibility following Rajan and Zingales (1998), and complemented by contract intensity, which captures

exposure to relationship-specific inputs and hence to enforcement risk (Nunn, 2007). Firm size interacts with all of this: smaller firms face disproportionate financing and legal constraints, which is the structural reason SMEs dominate the rationed segment of trade finance demand (Beck et al., 2005; World Trade Organization, 2016).

An important measurement caveat runs through this strand. Because the Rajan and Zingales measure is built from internal cash flow, it is by construction largely orthogonal to the trade credit and trade finance actually used by exporters, meaning that external finance dependence and trade finance dependence are distinct channels that should not be conflated (Ahn et al., 2011; Feenstra et al., 2014).

2.3. Trade Finance Supply Shocks and Export Outcomes

The identification problem is that finance and trade are jointly determined by demand. The literature's solution has been to find shocks to lender balance sheets that are plausibly exogenous to the borrower's export opportunities, following the within-borrower comparison logic of Khwaja and Mian (2008).

Three landmark studies anchor this strand. Amiti and Weinstein (2011), matching Japanese exporters to their main banks across the crises of 1990 to 2010, establish a causal link from bank health to the growth of a firm's exports relative to its domestic sales, with the relative-sales comparison neutralising firm-level demand shocks. Paravisini et al. (2015), using matched customs and credit registry data from Peru around the 2008 capital-flow reversal, compare exports of the same product to the same destination across firms banking with differentially affected lenders; they find that credit supply shocks operate on the intensive margin, with no significant effect on entry into or exit from new product-destination markets. Niepmann and Schmidt-Eisenlohr (2017b) shift the focus from working capital to risk, exploiting bank-level variation in trade finance claims by country; a one-standard-deviation negative shock to a destination's letter-of-credit supply reduces United States exports to that destination by approximately 1.5 percentage points, an effect driven by small and thinly banked destinations and more than doubling during the 2007 to 2009 crisis.

Macro and sectoral evidence is consistent. Countries facing higher interbank rates exported less to the United States at the peak of the crisis, with the effect concentrated in sectors requiring extensive external finance, holding few collateralisable assets, or lacking access to trade credit (Chor & Manova, 2012). Export credit insurance availability is likewise associated with trade volumes (Auboin & Engemann, 2014). At the same time, demand-side accounts explain a large share of the collapse (Eaton et al., 2016), and firms partially self-insure by substituting inter-firm trade credit for bank credit when banking conditions deteriorate (Demir & Javorcik, 2018). Foreign bank entry has been shown to improve firms' export dynamics, reinforcing the supply-side interpretation from a different angle (Fernandes & Duanmu, 2025). The reasonable synthesis is that finance was a genuine but second-order contributor to the aggregate collapse, and a first-order determinant of which countries, sectors, and firms bore it.

2.4. Payment Contracts and the Theory of Payment Terms

Precision about instruments matters, because different instruments carry different economic content and are captured by different data sources. Under open account, the exporter ships and invoices and the importer pays later, so the exporter bears both the financing burden and the credit risk; this dominates trade between established parties under strong enforcement (Antràs & Foley, 2015). Cash-in-advance is the mirror image, with the importer financing and bearing performance risk, and is characteristic of trade into weakly enforcing jurisdictions and of new relationships. Documentary collection places banks in the document chain without transferring credit risk. The letter of credit (LC) is the instrument in which the importer's bank irrevocably undertakes to pay against conforming documents, converting commercial risk into bank risk, with a confirming bank able to convert issuing-bank and country risk into local bank risk; it therefore embodies the risk-mitigation function most cleanly, as distinct from the liquidity function.

Schmidt-Eisenlohr (2013) formalises the choice among these contracts as a function of relative financing costs and the enforcement quality of the two jurisdictions, and shows that financing costs interact with distance: the longer the shipping lag, the greater the drag of financing costs on trade. Antràs and Foley (2015), using transaction data from a single United States exporter, document that cash-in-advance dominates in weakly enforcing destinations and that terms relax as relationships mature, which is evidence that payment terms substitute for institutions. Niepmann and Schmidt-Eisenlohr (2017a) extend the framework to documentary collections and rationalise a hump-shaped relation between LC use and enforcement quality: where enforcement is very strong, guarantees are unnecessary; where it is very weak, the guarantee itself is not credible or is prohibitively priced. The same study documents that letters of credit and documentary collections together cover on the order of one-tenth of United States exports and are used disproportionately for larger transactions, implying substantial fixed costs of use, while provision is highly concentrated among a small number of geographically specialised global banks (Niepmann & Schmidt-Eisenlohr, 2017b). This is the strand into which geopolitics must be inserted, and it has not been.

2.5. De-Risking and the Correspondent Banking Channel

Layered beneath the documentary instruments is the correspondent banking network, without which neither settlement nor confirmation is possible. Official-sector work established both the fact of contraction and its drivers, namely compliance fixed costs, sanctions exposure, and low corridor volumes (Bank for International Settlements, 2019; Financial Stability Board, 2017; World Bank Group, 2015). Borchert et al. (2024) supply the causal microeconomics, linking terminated correspondent relationships in emerging Europe to firm-level export losses on both margins that are only partially offset by higher domestic sales, with consequences for firm revenue and employment. This channel is analytically distinct from the LC channel: correspondent withdrawal removes the capacity to settle and confirm, whereas an LC supply shock raises the price of risk transfer. Empirically the two are correlated and, in the literature to date, rarely separated.

2.6. Geoeconomic Fragmentation

Aiyar et al. (2023) provide the reference framework, identifying trade, migration, capital flows, technology diffusion, and global public goods as transmission channels, and extending the analysis to the international monetary system and the global financial safety net. Evidence of supply-chain reallocation towards aligned partners is accumulating, though it remains contested whether observed shifts represent genuine decoupling or the lengthening of chains through intermediary jurisdictions (Alfaro & Chor, 2023; Antràs & Chor, 2022). Tariff episodes have been shown to pass through substantially to domestic prices, indicating that policy-driven fragmentation carries real welfare costs rather than merely reallocating rents (Amiti et al., 2019). The measurement of alignment itself has a settled solution in the ideal-point estimates recovered from UN General Assembly voting (Bailey et al., 2017). Notably, this literature's financial chapter concerns capital flows and reserve currency composition; the trade finance plumbing appears, if at all, as an aside.

2.7. Digitalisation as a Countervailing Force

Paper-based documentation is a major component of the fixed cost that rations small transactions and small firms out of the market. The UNCITRAL Model Law on Electronic Transferable Records provides the legal architecture for functional equivalence between paper and electronic documents of title, and adoption has been advancing through national enactments and compatible legislation (International Chamber of Commerce Digital Standards Initiative, 2024; United Nations Commission on International Trade Law, 2017). If fixed costs are indeed the binding constraint identified by Niepmann and Schmidt-Eisenlohr (2017a), legal adoption of electronic transferable records should measurably shift the threshold transaction size at which bank intermediation becomes viable, a prediction that has been asserted in policy circles but not, to the author's knowledge, tested against trade outcomes.

2.8. The Gap

Three gaps follow. First, the causal trade finance literature's leading estimates are drawn overwhelmingly from crisis episodes, namely 1990s Japan, and Peru and the United States in 2008 and 2009, and from a period that predates active fragmentation; whether the elasticity is stable in a non-crisis, geopolitically stressed regime is unknown. Second, no study interacts trade finance supply with geopolitical alignment, so the possibility that supply itself is reorganising along bloc lines is untested. Third, the risk channel and the settlement-capacity channel have not been jointly identified, leaving policy unable to distinguish whether the binding constraint is guarantee pricing or correspondent access, an important distinction because the remedies differ, requiring risk-sharing facilities in the first case and compliance-cost mutualisation in the second.

III. THEORETICAL FRAMEWORK AND HYPOTHESES

3.1. Framework

Consider a risk-neutral exporter in country i selling to an importer in country j at time t . Following Schmidt-Eisenlohr (2013), the exporter chooses a payment contract to minimise the sum of financing costs and expected enforcement losses. Let r_i and r_j denote financing costs, λ_{ij} the probability that a contract is enforced, and f^{LC}_{ijt} the fee for a third-party guarantee. Bank intermediation is chosen when the guarantee fee is less than the expected loss it eliminates, net of the fixed cost F of documentary processing:

$$\text{Bank intermediation chosen} \Leftrightarrow (1 - \lambda_{ij}) V_{ijt} - f^{LC}_{ijt} V_{ijt} > F_{ijt} \quad (1)$$

where V_{ijt} is transaction value. Three extensions are proposed.

3.1.1. Extension 1, supply as a Shifter of f^{LC}

Because guarantee provision is concentrated and geographically specialised, f^{LC}_{ijt} is not competitively determined at the corridor level; it responds to the balance-sheet capacity of the small set of banks active in that corridor (Niepmann & Schmidt-Eisenlohr, 2017b). A negative supply shock raises f^{LC} , pushing marginal transactions out of bank intermediation and, where no substitute contract is viable, out of trade altogether.

3.1.2. Extension 2, Alignment Enters λ

Let effective enforcement be $\lambda_{ij} = \lambda(\text{legal}_j, g_{ijt})$, decreasing in geopolitical distance g_{ijt} , because distance raises the probability of sanctions exposure, asset seizure, payment-channel interruption, and non-recognition of judgments. Two opposing forces follow. Higher g raises the value of a guarantee, increasing demand for bank intermediation; but higher g also raises the guarantee's cost, because the guaranteeing bank's own exposure has widened. Which dominates is an empirical question, and it is the central question of this paper.

3.1.3. Extension 3, Fixed Costs as a Policy Variable

F_{ijt} falls with legal adoption of electronic transferable records (United Nations Commission on International Trade Law, 2017). Since F is fixed rather than proportional, a reduction disproportionately expands intermediation of small transactions, which mechanically means the SME segment.

Embedding this into a structural gravity equation (Anderson & van Wincoop, 2003; Head & Mayer, 2014; Yotov et al., 2016), trade finance supply enters as a bilateral, time-varying trade cost, and the exporter-time and importer-time fixed effects absorb multilateral resistance terms.

3.2. Hypotheses

- H1. An exogenous negative shock to bilateral trade finance supply reduces EMDE bilateral exports. (Direction:

negative.)

- H2. The effect is larger in absolute magnitude for country pairs that are more geopolitically distant. (Interaction: negative.)
- H3. The effect is larger in sectors that are more financially vulnerable and more contract-intensive. (Triple interaction: negative.)
- H4. The effect operates predominantly on the intensive margin, consistent with Paravisini et al. (2015), with attenuated extensive-margin effects.
- H5. Legal adoption of electronic transferable records and the presence of MDB trade facilitation programmes attenuate the effect, disproportionately for small-value transactions. (Interaction: positive, that is, offsetting.)

H2 is the paper's distinguishing hypothesis and is genuinely two-sided; a positive interaction would indicate that guarantee demand dominates and that trade finance is buffering fragmentation rather than transmitting it. Both outcomes are publishable and policy-relevant, which is the appropriate design property.

IV. DATA AND VARIABLES

4.1. Sample

The estimation sample comprises bilateral flows for approximately 130 EMDE exporters to all partners, annually for 2012 to 2025. The start year is set by the availability of consistent corridor-level correspondent banking data; the end year by the current data frontier. Robustness samples restrict to (a) low-income and lower-middle-income exporters only, and (b) a balanced panel.

4.2. Dependent variables

Table 1. Dependent variables: definitions and data sources.

Variable	Definition	Source
X_{ijt}	Bilateral merchandise exports, nominal USD, in levels (not logs)	UN Comtrade; IMF Direction of Trade Statistics as cross-check
X_{ijkt}	Sector-level exports, HS 2-digit or ISIC	UN Comtrade
Extensive margin	Count of active HS 6-digit product-destination lines	UN Comtrade
Intensive margin	Mean value per active line	Derived

Levels rather than logarithms are used because the estimator is Poisson pseudo-maximum likelihood, which handles zeros natively and is consistent under heteroskedasticity that would bias log-linear ordinary least squares (Santos Silva & Tenreiro, 2006).

4.3. Principal explanatory variables

Table 2. Principal explanatory variables: definitions and data sources.

Variable	Definition	Source
TF_{ijt}	Bilateral trade finance supply capacity: LC and documentary collection message volumes and value; trade finance claims by counterparty country	SWIFT-derived aggregates; BIS consolidated and locational banking statistics; national supervisory returns
CB_{jt}	Active correspondent banking relationships per corridor; corridor concentration	BIS CPMI correspondent banking dataset
g_{ijt}	Absolute distance between UNGA ideal points	Bailey et al. (2017), updated series
ETR_{jt}	Binary or ordinal indicator of legal adoption of electronic transferable records	UNCITRAL status table; ICC DSI tracker
MDB_{jt}	Presence and size of MDB trade facilitation programme exposure	ADB, EBRD, IFC, AfDB programme reports

4.4. Sectoral Moderators

External finance dependence and asset tangibility follow Rajan and Zingales (1998); contract intensity follows Nunn (2007). Trade-finance dependence is constructed separately, in recognition of the orthogonality problem noted by Ahn et al. (2011).

4.5. Controls

Standard gravity controls (distance, contiguity, common language, colonial ties), regional trade agreement membership treated as potentially endogenous following Baier and Bergstrand (2007), exchange rate regime, sanctions indicators, commodity price exposure interacted with export structure, and destination GDP growth. Most time-varying monadic controls are absorbed by exporter-time and importer-time fixed effects and are retained only in specifications where those effects are relaxed.

4.6. Data Quality Procedures

Mirror-statistics reconciliation for Comtrade discrepancies; winsorisation of continuous variables at the 1st and 99th percentiles for descriptive reporting only, not for PPML estimation; explicit documentation of missingness mechanisms with a distinction maintained between structural zeros and unreported flows; and a stated policy against imputing the dependent variable.

V. ECONOMETRIC STRATEGY

5.1. Baseline Specification

$$X_{ijt} = \exp[\beta_1 \ln TF_{ijt} + Z_{ijt}'\gamma + \mu_{it} + v_{jt} + \eta_{ij}] \cdot \varepsilon_{ijt} \tag{2}$$

Exporter-time (μ_{it}) and importer-time (v_{jt}) fixed effects absorb multilateral resistance and all monadic time-varying shocks, including domestic financial conditions and demand. The pair fixed effect (η_{ij}) absorbs all time-invariant bilateral characteristics, so identification comes from within-corridor variation over time. Estimation uses Poisson pseudo-maximum likelihood with three-way high-dimensional fixed effects (Correia et al., 2020; Santos Silva & Tenreiro, 2006), with standard errors two-way clustered by country pair and by exporter-year. This is the specification recommended for structural gravity work by Yotov et al. (2016).

5.2. The moderation Specification (H2)

$$X_{ijt} = \exp[\beta_1 \ln TF_{ijt} + \beta_2 (\ln TF_{ijt} \times g_{ijt}) + Z_{ijt}'\gamma + \mu_{it} + v_{jt} + \eta_{ij}] \cdot \varepsilon_{ijt} \tag{3}$$

The main effect of g_{ijt} is absorbed by the pair fixed effect to the extent alignment is time-invariant; where it varies, it is included. The coefficient β_2 is the parameter of interest, and its sign discriminates between the transmission interpretation and the buffering interpretation set out in Section 3.1.

5.3. The Triple-Difference Specification (H3)

At the sector level, with exporter-sector-time, importer-sector-time, and pair-sector fixed effects, the interaction of trade finance supply with sectoral financial vulnerability identifies the effect off within-corridor, cross-sector variation. This is the most demanding specification and the closest analogue to the identification logic of Chor and Manova (2012), with the advantage that it is robust to any corridor-level shock common across sectors.

5.4. Identification

Ordinary least squares or naive PPML on TF_{ijt} is biased: corridors where exports are expanding attract more trade finance. Three complementary strategies are deployed.

5.4.1. Strategy A, Shift-Share Instrument

Define the instrument

$$Z_{ijt} = \sum_b S_{ij\ b,t_0} \Delta \text{shock}_{bt} \tag{4}$$

where S_{ijb,t_0} is bank b 's pre-period share of corridor ij trade finance provision and Δshock_{bt} is a bank-level shock plausibly unrelated to corridor demand, for example a supervisory enforcement action, a shock originating in a geographically unrelated portfolio, or a parent-level capital event. This follows Khwaja and Mian (2008) in spirit and Niepmann and Schmidt-Eisenlohr (2017b) in application, with the requirement that shares be measured in a pre-period and that shocks be demonstrably orthogonal to the corridor. Share exogeneity and shock exogeneity are assessed separately, and results are reported under both interpretations.

5.4.2. Strategy B, within-Borrower Comparison

Where matched bank-firm-customs data are obtainable for a subset of countries, the Amiti and Weinstein (2011) relative-sales comparison and the Paravisini et al. (2015) same-product and same-destination comparison are replicated. This subsample is smaller but identification is materially stronger, providing a benchmark against which the corridor-level estimates can be validated.

5.4.3. Strategy C, Event Studies

Discrete, dateable correspondent-banking withdrawal events furnish a staggered-adoption design, estimated with heterogeneity-robust estimators rather than naive two-way fixed effects, and accompanied by event-time plots to assess pre-trends directly.

5.5. Threats to Validity

Table 3. Threats to identification and corresponding mitigation strategies.

Threat	Manifestation	Mitigation
Reverse causality	Export growth attracts finance	Instrument; event studies
Omitted corridor shocks	Common shock to finance and trade	Pair FE; triple-difference off cross-sector variation
Measurement error in TF	SWIFT aggregates proxy imperfectly for capacity	Multiple proxies; attenuation bounds; instrument corrects classical error

Substitution across instruments	Firms shift to open account or inter-firm credit	Model contract choice as an outcome; test Demir and Javorcik (2018) substitution directly
Sanctions confounding	Alignment correlates with sanctions	Control for sanctions; re-estimate excluding sanctioned pairs
Shift-share share endogeneity	Bank presence reflects corridor prospects	Pre-period shares; Rotemberg-weight diagnostics; sensitivity to dropping dominant banks

VI. ROBUSTNESS AND VALIDATION ARCHITECTURE

- Estimator sensitivity: PPML baseline; Gamma PML and negative binomial as alternatives; log-linear OLS reported for comparability with older literature, with an explicit statement of its bias under heteroskedasticity (Santos Silva & Tenreiro, 2006).
- Fixed-effects sensitivity: progressive saturation from country and year effects through to the full three-way structure, with coefficient movement across specifications reported, since stability under saturation is itself evidence.
- Alternative alignment measures: UNGA ideal-point distance as the primary measure (Bailey et al., 2017); voting agreement on key votes, formal alliance membership, and sanctions co-membership as alternatives.
- Placebo tests designed to fail: trade finance supply shocks should not predict services exports that do not use documentary instruments; nor should they predict trade in the corridors of banks with no presence in the affected corridor. A positive result on a placebo invalidates the design and is to be reported.
- Pre-trend tests: event-time coefficients for periods before treatment, reported in full rather than summarised.
- Sample sensitivity: excluding commodity exporters; excluding the COVID-19 years 2020 and 2021; excluding entrepôt economies where re-export distorts bilateral attribution.
- Multiple hypothesis correction: Romano and Wolf stepdown across the hypothesis family, with both unadjusted and adjusted p-values reported.
- Economic significance: all effects translated into USD export value and, using a stated employment elasticity, into job-equivalents, so that statistical and economic significance are not conflated.

VII. PRIORS, REPORTING TEMPLATES, AND INTERPRETIVE THRESHOLDS

7.1. Important Note on Results

This manuscript documents the design, protocol, and analysis plan; the estimation tables below are reporting shells with pre-specified priors, not estimated results. The priors are derived from published elasticities in comparable settings and are stated here so that the study's conclusions cannot be reverse-engineered from its findings. Authors adapting this template must replace the prior column with estimated coefficients and standard errors before circulation.

Table 4 (shell). Baseline effect of trade finance supply on EMDE exports.

	PPML	+ pair FE	IV-PPML	Sector TD
ln Trade finance supply	[]	[]	[]	[]
× Financial vulnerability	n.a.	n.a.	n.a.	[]
Exporter × Year FE	Yes	Yes	Yes	Yes
Importer × Year FE	Yes	Yes	Yes	Yes
Pair FE	No	Yes	Yes	Yes
Observations	[]	[]	[]	[]
First-stage F	n.a.	n.a.	[]	[]

7.1.1. Prior for Column

An elasticity implying that a one-standard-deviation adverse supply shock reduces corridor exports by roughly 1 to 2 percentage points in normal times, scaling upward in stress periods, benchmarked to Niepmann and Schmidt-Eisenlohr (2017b). A materially larger estimate would suggest the EMDE setting is more finance-constrained than the United States corridors originally studied; a null would suggest either substitution into inter-firm credit (Demir & Javorcik, 2018) or measurement attenuation.

VIII. DISCUSSION: ANTICIPATED INTERPRETATION AND RIVAL EXPLANATIONS

The interpretive weight of this study rests on distinguishing four rival accounts of any observed correlation between trade finance retrenchment and EMDE export weakness.

- Account 1, the risk-price channel. Guarantee provision becomes more expensive, marginal transactions become unprofitable, and trade falls. This is the mechanism that the LC-specific measures and the sectoral triple-difference are designed to isolate, since a risk-price mechanism should bite hardest in contract-intensive sectors and in destinations of intermediate enforcement quality (Niepmann & Schmidt-Eisenlohr, 2017a; Nunn, 2007).

- Account 2, the settlement-capacity channel. Correspondent withdrawal removes the ability to transact at all, independent of price. This should produce discontinuous, corridor-wide effects with little sectoral gradient, and should be visible in the event-study design (Borchert et al., 2024).
- Account 3, the working-capital channel. General credit tightening reduces firms' ability to fund production, with exports falling as a by-product. This should show up in domestic sales as well, which is precisely why the relative-sales comparison of Amiti and Weinstein (2011) is included as a validation subsample.
- Account 4, demand. Fragmentation reduces trade for reasons unrelated to finance, and finance follows trade. This is the account that the exporter-time and importer-time fixed effects, the instrument, and the placebo tests are collectively designed to defeat; the demand-side literature is sufficiently strong that failing to address it would be disqualifying (Eaton et al., 2016).

A finding that Accounts 1 and 2 both carry weight, with different sectoral and geographic incidence, is the outcome the design considers most likely and would have the clearest policy content, because it implies that risk-sharing facilities and compliance-cost mutualisation are complements rather than substitutes. The alignment result carries the study's principal interpretive risk. Alignment is correlated with sanctions, with currency invoicing patterns, and with historical banking relationships; a naive reading of a significant β_2 as evidence of deliberate financial statecraft would be unwarranted. The more defensible claim, and the one the design supports, is that whatever its motive, whether sanctions caution, correspondent risk appetite, or supervisory expectation, the incidence of trade finance retrenchment is correlated with geopolitical distance, and this incidence has real trade consequences for countries that did not choose it. That is a fact about system design rather than about intent, and it is actionable on those terms.

IX. POLICY IMPLICATIONS

9.1. For Multilateral Development Banks

If effects concentrate in thinly banked corridors, then eligibility criteria based on national income classification are mis-targeted, since a middle-income country can contain severely rationed corridors. Corridor-level exposure metrics, such as active correspondent counts, provider concentration, and LC coverage ratios, would target risk-sharing capacity where the marginal return is highest. The persistence of the aggregate gap across survey rounds despite growth in programme volumes suggests that current allocation is not exhausting available returns (Asian Development Bank, 2025).

9.2. For Prudential and AML/CFT Authorities

De-risking is an equilibrium response to a cost structure rather than a preference. Where fixed compliance costs exceed corridor revenue, exit is rational for each bank and collectively harmful. Mutualised due-diligence utilities, standardised questionnaires, and proportionate supervisory expectations address the cost structure directly; exhortation does not (Financial Stability Board, 2017; World Bank Group, 2015).

9.3. For Trade Ministries and Legislatures

Adoption of electronic transferable records legislation is among the few available instruments that lowers the fixed cost of documentary intermediation rather than subsidising its price. Because the constraint is fixed rather than proportional, the incidence of reform falls disproportionately on small transactions and small firms, the segment where rationing is most severe (Asian Development Bank, 2025; United Nations Commission on International Trade Law, 2017; World Trade Organization, 2016).

9.4. For the Multilateral System

If financial infrastructure is a fragmentation transmission channel, then the monitoring apparatus built around tariffs and non-tariff measures is incomplete. Corridor-level trade finance capacity is measurable and should be monitored with the same regularity as trade policy, since it can deteriorate rapidly and without any policy announcement (Aiyar et al., 2023;

X. LIMITATIONS

- Measurement. SWIFT message aggregates and BIS banking statistics proxy for trade finance capacity but do not observe pricing, denial rates, or the composition of rejected applications. The unmet demand that defines the trade finance gap is, by construction, unobserved in transaction data; survey evidence is the only source and carries its own selection concerns (Asian Development Bank, 2023).
- Aggregation. Corridor-level analysis cannot observe firm heterogeneity. The matched-data subsample partially addresses this but is not globally representative.
- Instrument validity. Shift-share designs require share exogeneity or shock exogeneity; neither is directly testable. Diagnostics can bound but not eliminate the concern.
- Attribution of alignment effects. As discussed in Section 8, the design identifies incidence rather than intent.
- External validity across regimes. Estimates from 2012 to 2025 may not extrapolate to a severe crisis, when the literature suggests elasticities more than double (Niepmann & Schmidt-Eisenlohr, 2017b).
- Entrepôt and transshipment. Bilateral attribution is distorted where goods route through intermediaries, and the distortion may itself be endogenous to fragmentation (Alfaro & Chor, 2023).
- Non-bank provision. Fintech and supply-chain finance platforms are growing and are poorly captured in supervisory data, which may cause the study to overstate the bindingness of bank supply constraints.

XI. FUTURE RESEARCH AGENDA

- Firm-level replication across multiple EMDEs, using matched customs and credit registry data, to test whether the corridor-level elasticity aggregates correctly from firm behaviour.
- Direct measurement of non-bank provision, through platform-level data partnerships, to establish whether fintech entry is substituting for or merely repackaging bank capacity.
- Causal evaluation of electronic transferable records adoption using staggered national enactment as a design, with transaction-size heterogeneity as the key prediction.
- Currency composition and trade finance. The observed interest in local-currency settlement raises the question of whether currency diversification relaxes or tightens trade finance constraints, given the dollar's dominant role in existing documentary practice.
- Welfare quantification in a general-equilibrium framework, incorporating finance frictions into a quantitative trade model to price the welfare cost of the financing gap.
- Contract choice as an outcome. Testing whether firms shift along the cash-in-advance, open-account, and LC margin in response to alignment shifts would provide direct evidence on the Schmidt-Eisenlohr (2013) mechanism, complementing the reduced-form volume analysis.

XII. CONCLUSION

Trade finance is the connective tissue between the financial system and the real economy of cross-border exchange, and it is unusually concentrated, unusually geographic, and unusually invisible in the datasets that policymakers routinely monitor. The literature has established convincingly that shocks to its supply reduce exports (Amiti & Weinstein, 2011; Niepmann & Schmidt-Eisenlohr, 2017b; Paravisini et al., 2015), and separately that the world economy is fragmenting along geopolitical lines (Aiyar et al., 2023). This study proposes to join those findings, asking whether the financing channel is one of the routes through which fragmentation is transmitted to the countries least equipped to absorb it.

The design's principal virtue is that it is genuinely falsifiable in both directions. If the alignment interaction is null, the policy conclusion is that the financing gap is a market-failure problem soluble through conventional instruments, namely risk-sharing, compliance-cost reduction, and legal modernisation. If the interaction is negative, the conclusion is that trade finance has become part of the geoeconomic terrain, and that neutral financing capacity is a global public good requiring deliberate provision. If it is positive, the conclusion is that bank intermediation is currently functioning as a shock absorber, and that policy should protect that function rather than assume it. A persistent USD 2.5 trillion shortfall, borne disproportionately by small firms in poor countries, warrants knowing which of these is true.

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