

PREFACE TO THE EDITION

It is with great pleasure that we present the inaugural issue of the **Eduschool Journal of Trade and Finance (EJTF), Vol. 1, No. 1 (2026)**. This issue brings together a focused collection of scholarly contributions examining contemporary challenges at the intersection of international trade, trade finance, financial markets, and the evolving global economic environment.

A central theme running through this issue is the crucial role of finance in enabling international trade. The opening contribution, “*Bridging the Global Trade Finance Gap: Structural Causes, Real Economic Effects, and the Promise of Digitalisation*,” examines the persistent global trade finance gap and its disproportionate impact on small and medium-sized enterprises and firms in developing economies. The study highlights information asymmetries, compliance and prudential costs, paper-based processes, and currency-liquidity constraints as important structural barriers, while examining digitalisation, financial-technology innovations, development-bank programmes, and regulatory reforms as possible pathways towards narrowing the gap.

The issue also explores the relationship between sovereign financial distress and international trade. “*The Trade Costs of Sovereign Default Reconsidered*” revisits the substantial decline in trade following sovereign default and questions whether this decline should primarily be understood as a form of economic punishment or as the consequence of disruption to trade credit, banking activity, and access to imported inputs. By emphasizing financial disruption rather than direct trade retaliation, the article contributes to an important reconsideration of the mechanisms through which sovereign financial crises affect real economic activity.

Another significant contribution addresses trade policy uncertainty and financial constraints affecting firms' export decisions. The article “*Trade Policy Uncertainty, Financial Frictions, and the Sources of Export Hysteresis*” brings together two explanations for why potentially profitable firms may delay entering export markets or fail to resume exporting after adverse conditions improve. Its analysis emphasizes that uncertainty and financial constraints can reinforce one another, suggesting that trade agreements and trade finance facilities may need to be considered as complementary rather than interchangeable policy responses.

The issue further considers the influence of the US dollar on global trade through both pricing and financial channels. “*Does a Strong Dollar Shrink World Trade? Reconciling the Pricing and Financial Channels of Dollar Transmission*” examines how dollar-based pricing arrangements and dollar-denominated financial conditions can influence international trade. By distinguishing these channels, the article draws attention to the complexity of exchange-rate transmission and to the need to consider both trade invoicing and financial funding structures when assessing the effects of dollar movements on global commerce.

Finally, “*Financing a Fragmenting World: Bank-Intermediated Trade Finance Supply, Geopolitical Alignment, and Export Performance in Emerging Market and Developing Economies, 2012–2025*” extends the discussion to the increasingly important relationship between trade finance, geopolitical alignment, and export performance. The study proposes an empirical framework for investigating whether the supply of bank-intermediated trade finance affects exports in emerging market and developing economies and whether geopolitical fragmentation is reshaping the financial infrastructure through which international trade is conducted.

Taken together, the contributions in this issue demonstrate that international trade cannot be understood solely through tariffs, exchange rates, or conventional measures of market access. The financial architecture supporting trade including credit, banking relationships, working capital, currency arrangements, digital infrastructure, and institutional frameworks plays a fundamental role in determining who can participate in global commerce and under what conditions.

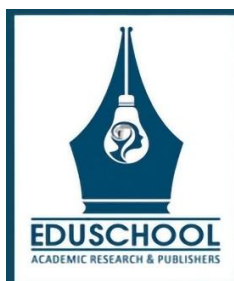
The issue therefore offers a valuable perspective on some of the structural transformations currently shaping the global trading system. From the persistent trade finance gap and the consequences of sovereign default to export hysteresis, dollar transmission, and geopolitical fragmentation, the articles collectively underline the importance of examining trade and finance as closely interconnected dimensions of the global economy.

We hope that this inaugural issue of the Eduschool Journal of Trade and Finance will stimulate further academic discussion, encourage new empirical and theoretical investigations, and contribute meaningfully to scholarship on international trade and financial systems. We extend our sincere appreciation to the authors, reviewers, editorial contributors, and all those who have supported the development of this journal.

Evin Varghese
Chief Editor

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EDUSCHOOL JOURNAL OF TRADE AND FINANCE (EJTF)

(Open Access, Double-Blind Peer Reviewed Journal)

ISSN Online:



Bridging the Global Trade Finance Gap: Structural Causes, Real Economic Effects, and the Promise of Digitalisation

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Article information

Received: 5th March 2026

Received in revised form: 8th April 2026

Accepted: 12th May 2026

Available online: 11th June 2026

Volume: 1

Issue: 1

DOI: <https://doi.org/10.5281/zenodo.20639521>

Abstract

Trade finance underpins the great majority of world merchandise trade, yet a large and persistent share of demand for it goes unmet. The Asian Development Bank estimates the global trade finance gap at roughly US\$2.5 trillion, with small and medium-sized enterprises (SMEs) and firms in developing economies bearing the heaviest burden. This paper provides a structured review of the trade finance gap, organised around three questions: what drives it, what are its real economic consequences, and which interventions show promise in closing it. Synthesising peer-reviewed empirical research with institutional survey evidence, the review documents the trajectory and distribution of the gap, traces its structural causes to information asymmetries, compliance and prudential costs, paper-based operations, and currency-liquidity constraints, and links the resulting credit rationing to measurable losses in export entry, export volumes, and crisis resilience at the firm level. It then evaluates four pathways to closing the gap (legal and technical digitalisation, financial-technology and supply-chain-finance innovation, multilateral and development-bank programmes, and proportionate regulatory recalibration), paying particular attention to the adoption of electronic transferable records. The review concludes that the gap is less a problem of scarce capital than of frictions in information, law, and process, and sets out an agenda for future research, including improved measurement of the gap and rigorous impact evaluation of digital-trade reforms.

Keywords: - Trade Finance, Trade Finance Gap, SME Access To Finance, Credit Constraints And Exports, Trade Digitalisation, Electronic Transferable Records, Supply Chain Finance.

I. INTRODUCTION

By common estimate, some form of credit, guarantee, or payment intermediation supports around four-fifths of world merchandise trade, making trade finance one of the least visible but most load-bearing components of the international economy (ADB, 2025). When a seller in one jurisdiction ships goods to a buyer in another, the two sides face a fundamental timing and trust problem: the exporter wishes to be paid before or upon shipment, while the importer prefers to pay only after receiving conforming goods. Instruments such as letters of credit, documentary collections, bank guarantees, and increasingly open-account supply chain finance exist to bridge that gap, allocating risk and providing working capital across the life of a cross-border transaction.

Despite this central role, a large share of the demand for trade finance is never met. The Asian Development Bank's most recent Global Trade Finance Gap Survey estimates the gap (the difference between requested and supplied trade finance) at approximately US\$2.5 trillion, where it has remained since 2022 (ADB, 2025). Set against global merchandise trade of roughly US\$33 trillion in 2024 (UNCTAD, 2025), a shortfall of this magnitude represents a substantial and recurring drag on commerce, growth, and employment. The burden is not evenly shared. SMEs and firms in developing economies are rationed most severely: institutional surveys have repeatedly found rejection rates for SME applications far above those for large multinational corporates (ADB, 2016; WTO, 2016).

What makes the gap analytically interesting is that it cannot be explained by credit losses alone. Industry loss data indicate that default rates on short-term international trade credit are very low, on the order of a fraction of one per cent (ICC, 2013). A market in which a low-risk, self-liquidating asset class is nonetheless heavily rationed is, on its face, a puzzle. It suggests that the binding constraints lie less in the underlying economics of repayment than in frictions of information, regulation, and process: frictions that fall hardest on precisely those firms with the thinnest credit histories and the weakest bargaining power.

This paper offers a structured review of the trade finance gap built around three research questions. First, what are the structural drivers of the gap (RQ1)? Second, what are its real economic effects on firms and economies (RQ2)? Third, which interventions show genuine promise in closing it (RQ3)? In addressing these questions the review draws together two literatures that are too often kept apart: the rigorous, firm-level empirical economics of credit constraints and trade, and the practitioner and institutional evidence produced by development banks, the World Trade Organization, and the International Chamber of Commerce. The contribution is integrative rather than empirical in the primary-data sense: the paper does not estimate new parameters but organises and reconciles existing evidence into a coherent causes–effects–solutions framework, and uses that framework to identify where the evidence is strong, where it is thin, and where future research is most needed.

The remainder of the paper is organised as follows. Section 2 sets out a conceptual framework explaining why finance matters for trade and how the gap is defined and measured. Section 3 describes the review's scope and method. Section 4 documents the magnitude and distribution of the gap. Section 5 analyses its structural causes, and Section 6 reviews the evidence on its real economic effects. Section 7 evaluates four pathways to closing the gap, with particular attention to digitalisation. Section 8 sets out research gaps and a forward agenda, and Section 9 concludes.

II. CONCEPTUAL FRAMEWORK: WHY FINANCE MATTERS FOR TRADE

2.1. Instruments of Trade Finance

Trade finance is best understood not as a single product but as a family of arrangements that manage the payment, performance, and financing risks inherent in cross-border exchange. At one end of a risk spectrum sits cash-in-advance, which protects the exporter entirely at the importer's expense; at the other sits open account, where goods are shipped and delivered before payment is due, protecting the importer. Between these poles lie the classic bank-intermediated instruments. The documentary letter of credit substitutes the creditworthiness of a bank for that of the buyer, with payment conditional on the presentation of conforming documents. Documentary collections use the banking system to exchange shipping documents for payment without a bank guarantee of payment. Bank guarantees and standby letters of credit backstop performance. More recently, supply chain finance (including reverse factoring, in which a buyer's stronger credit standing is used to mobilise early payment to its suppliers) has expanded rapidly, channelling liquidity toward lower-tier and smaller firms in a value chain (ADB, 2025).

2.2. Theoretical Channels Linking Finance and Trade

Why should access to finance matter more for international than for purely domestic transactions? Cross-border trade involves longer shipping times, greater distances, additional documentation, and weaker contract enforcement, all of which lengthen the interval between production outlays and final receipt of revenue. Exporters therefore require more working capital, and bear more risk, than otherwise comparable domestic producers. This intuition is the foundation of a substantial body of theory and evidence on credit constraints and trade. Manova (2013) formalises how credit constraints interact with firm heterogeneity, showing that financial frictions depress trade both by deterring otherwise productive firms from entering export markets (the extensive margin) and by limiting the scale of those that do export (the intensive margin), with the largest effects in sectors most dependent on external finance, a vulnerability measured in the tradition of Rajan and Zingales (1998).

The empirical literature has established that these channels are causal rather than merely correlational. Using matched firm–bank data for Japan, Amiti and Weinstein (2011) show that the health of a firm's banks affects its exports more than its domestic sales, isolating a trade-finance channel distinct from generic external-finance dependence. Studies of the global financial crisis reinforce the point: Chor and Manova (2012) find that economies with tighter and more expensive credit exported less to the United States during 2008–2009, and Bricongne et al. (2012) show that French exporters in more finance-dependent sectors contracted most sharply. Using matched credit-and-export data, Paravisini et al. (2015) trace how shocks to the supply of bank credit pass through to reductions in exports. Taken together, this work converts the practitioner claim that trade finance is essential into a measurable economic relationship: when finance contracts, trade contracts with it.

2.3. Defining and Measuring the Gap

The trade finance gap is conventionally defined as the value of requested trade finance that is proposed and subsequently rejected: unmet demand from firms that sought financing and were turned down. This definition, used by the principal institutional surveys, is informative but imperfect. It captures rejected applications but not discouraged borrowers who never apply; African Development Bank research, for example, finds that a meaningful share of SMEs do not apply at all for fear of rejection, high collateral requirements, or unfamiliarity with the process (ADB, 2025). The gap is also a survey-based estimate extrapolated from a sample of providers rather than a directly observed market total, which means its level should be read as an order of magnitude rather than a precise figure. Section 4 returns to these measurement issues when interpreting the trend data.

III. REVIEW APPROACH

This paper is a structured narrative review rather than a systematic review or meta-analysis: it does not pool effect sizes statistically, but it follows an explicit and reproducible logic of question definition, source selection, and thematic synthesis.

Three research questions frame the review. RQ1 concerns the structural causes of the gap; RQ2 concerns its real economic effects on firms and economies; and RQ3 concerns the interventions that show promise in closing it.

Two complementary bodies of evidence are drawn upon. The first is the peer-reviewed economics literature on credit constraints and international trade, selected for its methodological rigour in establishing causal links between finance and trade outcomes. The second is institutional and practitioner evidence (principally the periodic gap surveys of the Asian Development Bank, analyses by the World Trade Organization, and data and standards work by the International Chamber of Commerce and UNCITRAL), selected for its direct measurement of market-level quantities that academic datasets rarely capture. Sources were included where they spoke directly to one of the three research questions and where their findings could be corroborated across more than one independent source; figures reported by a single commercial source were treated as indicative only. The evidence is then organised into the causes–effects–solutions structure that shapes Sections 5 through 7. Because the institutional estimates are survey-based and the academic studies span different countries and periods, the synthesis emphasises the direction and robustness of findings over point estimates.

IV. THE MAGNITUDE AND DISTRIBUTION OF THE GAP

The estimated global trade finance gap has widened markedly over the past decade. Successive Asian Development Bank surveys placed it at around US\$1.4 trillion in 2014 and US\$1.6 trillion in 2015, rising to US\$1.5 trillion in 2018 and US\$1.7 trillion in 2020 before jumping to US\$2.5 trillion in 2022, an increase widely attributed to the combined shocks of the pandemic, the war in Ukraine, and sharply higher interest rates (ADB, 2016; ADB, 2025). The most recent survey finds the gap has stabilised at that elevated level, though the bank cautions that its underlying data were collected before the most recent round of tariff and trade-policy disruption and may understate emerging pressures (ADB, 2025). Table 1 summarises the trajectory.

Table 1. Estimated global trade finance gap over time

Reference Year	Estimated Gap (US\$)	Context
2014	≈ 1.4 trillion	Early survey baseline
2015	≈ 1.6 trillion	Developing Asia share ≈ US\$692 billion
2018	≈ 1.5 trillion	Pre-pandemic
2020	≈ 1.7 trillion	Onset of pandemic disruption
2022	≈ 2.5 trillion	Pandemic, war, higher interest rates
2023–2025	≈ 2.5 trillion	Stabilised; demand expected to rise

Source: compiled from Asian Development Bank Global Trade Finance Gap Surveys (ADB, 2016; ADB, 2025). Figures are survey-based estimates and should be read as orders of magnitude.

The distribution of the gap is as important as its level. The shortfall is concentrated among SMEs and in developing economies. Earlier surveys reported that a majority of SME applications were rejected: an Asian Development Bank brief put the SME rejection rate at 57 per cent against 10 per cent for multinational corporations, while the World Trade Organization similarly found roughly half of SME applications turned down compared with a single-digit rate for large firms (ADB, 2016; WTO, 2016). The most recent survey reports a notable narrowing: the SME rejection rate fell to about 41 per cent, close to the 40 per cent recorded for large and mid-cap corporates, a convergence the bank attributes partly to the spread of dedicated SME strategies and pre-shipment financing among banks, while cautioning that the result requires further study (ADB, 2025). Table 2 sets out these figures.

Table 2. Trade finance rejection rates by firm type, selected surveys

Survey	SME Rejection Rate	Large / Multinational
ADB (2016, ref. 2015)	≈ 57%	≈ 10%
WTO (2016)	≈ 50%	≈ 7%
ADB (2023)	≈ 45%	n.a.
ADB (2025)	≈ 41%	≈ 40%

Source: compiled from ADB (2016), WTO (2016), and ADB (2025). Definitions and samples differ across surveys; figures are not strictly comparable and indicate broad orders of magnitude.

Two caveats temper an optimistic reading of the recent convergence. First, because the gap is measured from rejected applications, improvements in reported rejection rates may partly reflect changes in who applies rather than in underlying access. Second, the same survey reports that the binding constraint on supply has shifted: the most cited obstacle is now US-dollar liquidity, alongside high capital charges and policy uncertainty, with the large majority of surveyed banks expecting demand for trade finance to rise as firms diversify suppliers and reconfigure supply chains (ADB, 2025). A stable headline gap can therefore coexist with intensifying pressure beneath the surface.

V. STRUCTURAL CAUSES OF THE GAP

5.1. Information Asymmetry and the Perception of Credit Risk

The most frequently cited reason for rejection is informational. A large share of declined applications are turned away on grounds of perceived credit risk or insufficient information rather than realised default, and SMEs are disadvantaged precisely because they have shorter credit histories, less collateral, smaller and less standardised financial records, and weaker

name recognition than large corporates (ADB, 2025). The low realised default rates on short-term trade credit (ICC, 2013) suggest that much of this risk perception is a problem of information rather than of fundamentals: banks cannot cheaply verify the quality of a small unfamiliar borrower, and in the presence of fixed assessment costs it is rational to decline small tickets. The result is a classic adverse-selection-driven rationing of creditworthy but informationally opaque firms.

5.2. Compliance and Prudential Costs

Regulation compounds the information problem. Anti-money-laundering and know-your-customer obligations impose substantial fixed costs on the on-boarding and monitoring of trade counterparties, and surveys have consistently found these requirements to be a leading impediment to expanding trade finance, particularly to smaller firms whose transactions are too small to amortise the compliance burden (ADB, 2016). Prudential capital and liquidity rules add a further layer: by raising the capital and stable-funding that banks must hold against trade exposures, post-crisis frameworks can make low-margin SME trade finance comparatively unattractive relative to other uses of bank balance sheets, even when the underlying assets are short-dated and low-loss. The cumulative effect is that the economics of compliance and capital, rather than the economics of repayment, often determine whether a small exporter is financed.

5.3. Paper-Based Processes and Operational Cost

Trade finance remains strikingly analogue. The International Chamber of Commerce has estimated that roughly four billion pages of documents circulate in documentary trade each year, and that digitisation could cut trade finance costs by up to US\$6 billion and raise banks' trade finance revenues by around ten per cent over a three-to-five-year horizon (ICC, 2018). Manual processing of bills of lading, invoices, certificates, and letters of credit is slow, error-prone, and expensive, and it raises the risk of fraud and document duplication. These operational costs again fall disproportionately on small transactions, where the fixed cost of processing is large relative to the value financed, reinforcing the bias against SMEs identified above.

5.4. Currency Liquidity and Macroeconomic Uncertainty

Finally, the supply of trade finance is sensitive to macro-financial conditions. The most recent survey identifies US-dollar liquidity as the single biggest obstacle to expanding supply, reflecting the dollar's dominant role in trade invoicing and settlement; when dollar funding tightens, banks ration trade exposures, often in the markets and to the firms least able to absorb the shortfall (ADB, 2025). Policy uncertainty (including shifts in tariffs and the reconfiguration of supply chains) adds risk premia and can deter banks from extending or renewing facilities. These channels explain why the gap is procyclical and why it widened so sharply amid the overlapping shocks of the early 2020s.

VI. REAL ECONOMIC EFFECTS

The structural frictions described above are not merely administrative inconveniences; they translate into measurable losses in trade, growth, and resilience. The firm-level evidence is the most rigorous. Because trade finance bears more directly on exporting than on domestic sales, shocks to financial intermediaries pass through to trade with unusual force. Amiti and Weinstein (2011) show that deterioration in the health of a firm's banks reduces its exports disproportionately, and Paravisini et al. (2015) demonstrate that contractions in the supply of bank credit reduce export volumes through a credit channel that is distinct from demand. The implication is that a firm rationed out of trade finance does not simply substitute another source of funding at a slightly higher price; it exports less, or not at all.

These effects are amplified in crises. The collapse of world trade in 2008–2009 was far larger than the contraction in output, and a body of research attributes part of this amplification to the seizing-up of trade credit. Chor and Manova (2012) find that economies facing tighter and costlier credit exported less during the crisis, and that the contraction was concentrated in sectors most dependent on external finance; Bricongne et al. (2012) document the same pattern among French exporters. The crisis evidence is valuable precisely because it provides plausibly exogenous variation in credit conditions, strengthening the causal interpretation of the finance–trade link.

At the level of economies, the consequences are framed in terms of foregone growth and employment. Institutional analyses consistently argue that the inability to finance willing buyers and sellers suppresses trade-driven growth and job creation, with the heaviest costs borne by developing economies whose firms are most likely to be rationed (ADB, 2025). When formal trade finance is unavailable, firms turn to slower or more expensive informal arrangements, or forgo transactions altogether, an inefficiency that compounds over time as rationed firms fail to build the trading track record that would eventually ease their access to credit. In this sense the gap is partly self-perpetuating: exclusion today produces the thin credit histories that justify exclusion tomorrow.

VII. PATHWAYS TO CLOSING THE GAP

If the gap is driven less by scarce capital than by frictions in information, law, and process, then the most promising interventions are those that attack those frictions directly. Four pathways stand out.

7.1. Legal and Technical Digitalisation

The most structural reform is to make trade documents digital and legally enforceable across borders. The central instrument is UNCITRAL's Model Law on Electronic Transferable Records (MLETR), adopted in 2017, which establishes the legal equivalence of electronic and paper transferable documents such as bills of lading, warehouse receipts, and bills of exchange (UNCITRAL, 2017). Without such a framework, an electronic bill of lading lacks the legal status of its paper counterpart, and the documentary chain cannot be fully digitised. Momentum has built since the G7 endorsed the principles of digital trade documents, and the United Kingdom's Electronic Trade Documents Act (which took effect in 2023 and implements MLETR principles) has served as a template for other jurisdictions (ADB, 2025). The International Chamber of Commerce's

Digital Standards Initiative has promoted adoption and common data standards, and reform is now advancing in emerging markets, including India, where a Digital Trade Facilitation Bill aligned with MLETR principles has been brought forward (ICC, 2024). The prize is large: alongside the direct cost savings estimated by the ICC, end-to-end digitisation shifts trade finance from a document-centric to a data-centric process, which in turn enables the credit-assessment innovations discussed next.

7.2. Financial Technology, Alternative Data, and Supply Chain Finance

Digitisation of the underlying transaction makes it possible to assess credit on the basis of transaction-level behaviour (payment history, shipping reliability, and fulfilment data) rather than traditional collateral and audited statements. This is especially valuable for SMEs and informal traders that fail conventional credit screens despite being good risks, and it is the logic behind the rapid growth of supply chain finance, which uses the stronger credit standing of an anchor buyer to mobilise liquidity to its smaller suppliers (ADB, 2025). A persistent obstacle, however, is awareness: surveys have found that a large majority of smaller firms are unfamiliar with digital finance tools, although among those that are familiar, peer-to-peer lending has seen relatively strong uptake in developing economies (ADB, 2016). Closing the gap through technology therefore requires investment in firm-level capability and trust as much as in platforms.

7.3. Multilateral and Development-Finance Programmes

Where private supply is structurally deficient, multilateral and development-finance institutions can fill part of the gap and crowd in commercial lenders by absorbing risk. The Asian Development Bank's long-running Trade Finance Program reports having supported thousands of SMEs and many thousands of transactions across the region since 2009 (ADB, 2025). Public-private facilities can extend reach further: development institutions partnering with commercial banks have launched dedicated facilities aimed at exporters in emerging markets. Such interventions are best understood not as a permanent substitute for private finance but as a means of building track records and demonstrating the low realised risk of trade exposures, thereby gradually drawing private capital into segments it had avoided.

7.4. Proportionate Regulatory Recalibration

Finally, regulators can narrow the gap by aligning prudential and compliance requirements more closely with the demonstrated risk profile of trade finance. Because realised default rates on short-term trade credit are very low (ICC, 2013), there is a case for proportionate treatment of trade exposures in capital and liquidity rules and for risk-based, digitally enabled approaches to anti-money-laundering and know-your-customer compliance that lower the fixed cost of on-boarding small counterparties. The objective is not to weaken safeguards but to ensure that the cost of compliance is commensurate with the risk being managed, so that low-risk small-firm trade is not priced out by requirements calibrated to higher-risk activity.

VIII. RESEARCH GAPS AND A FUTURE AGENDA

Four gaps in the evidence base stand out and define a forward research agenda. First, measurement of the gap remains crude. The headline figure is a survey-based estimate of rejected demand that omits discouraged borrowers and rests on extrapolation from a sample of providers; developing better-grounded, more frequent, and more granular measures (ideally combining supervisory data with firm surveys) would materially improve both diagnosis and evaluation. Second, while the causal effect of credit on trade is well established for advanced economies and crisis episodes, far less rigorous firm-level evidence exists for SMEs in developing economies during normal times, which is precisely the population where the gap is concentrated; matched credit-and-trade datasets in these settings would be especially valuable. Third, the rapid wave of digital-trade legal reform creates an opportunity for credible impact evaluation: as jurisdictions adopt MLETR-aligned legislation at different times, researchers can exploit this staggered roll-out to estimate the effect of legal digitalisation on trade finance availability, costs, and SME participation. Fourth, the interaction between supply chain finance, alternative-data credit assessment, and financial inclusion is under-studied, as is the relationship between trade digitalisation and environmental and governance objectives that practitioners increasingly emphasise.

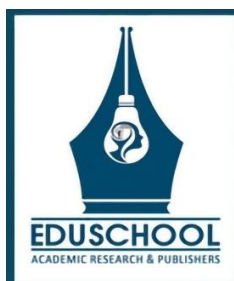
IX. CONCLUSION

The global trade finance gap is large, persistent, and unequally distributed, falling most heavily on the small and developing-economy firms whose participation in trade matters most for inclusive growth. Yet the central lesson of the evidence reviewed here is that the gap is not primarily a shortage of capital chasing a risky asset. Realised losses on short-term trade credit are low; the binding constraints lie in information asymmetries, the fixed costs of compliance and prudential capital, the inefficiency of paper-based processes, and the procyclical scarcity of dollar liquidity. Because the frictions are informational, legal, and operational, so are the most promising remedies: legally enforceable digital trade documents, data-driven credit assessment and supply chain finance, well-targeted multilateral programmes, and proportionate regulation. The firm-level economics establishes what is at stake (when finance contracts, trade contracts with it), while the institutional evidence shows where intervention can bite. Translating that understanding into measurable reductions in the gap will require not only continued reform but also better measurement and rigorous evaluation, so that the substantial investments now being made in digital trade can be judged by their effects on the firms that the gap currently leaves behind.

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EDUSCHOOL JOURNAL OF TRADE AND FINANCE (EJTF)

(Open Access, Double-Blind Peer Reviewed Journal)

ISSN Online:



The Trade Costs of Sovereign Default Reconsidered

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Article information

Received: 2nd March 2026

Received in revised form: 4th April 2026

Accepted: 10th May 2026

Available online: 11th June 2026

Volume: 1

Issue: 1

DOI: <https://doi.org/10.5281/zenodo.21883587>

Abstract

Trade falls sharply after sovereign default, by roughly eight percent a year between a defaulter and its creditors, persisting for about fifteen years. That finding has been read in two incompatible ways. On the punishment reading, creditors and their governments retaliate, and the anticipated loss of trade is part of what makes sovereign debt enforceable in the absence of collateral or courts. On the disruption reading, nothing is being enforced: trade credit evaporates, banks holding defaulted paper contract lending, importers lose access to inputs, and the trade decline is a symptom of a broken financial circuit rather than a sanction. This article reviews the evidence and argues that the disruption reading now commands most of it. Direct trade sanctions are essentially undocumented; the decline concentrates in sectors dependent on external finance and on imported inputs; and the mechanism that reproduces the observed output and trade dynamics in general equilibrium runs through working capital for imported inputs rather than through retaliation. Three consequences follow, and none is minor. First, the enforcement theory of sovereign debt loses one of its principal candidate mechanisms, which matters because the alternatives have known weaknesses. Second, the trade cost of default becomes a remediable friction rather than an equilibrium feature, which changes what restructuring architecture and trade finance backstops can be expected to achieve. Third, the rhetorical use of trade costs in debt negotiations, where the prospect of trade collapse is deployed as an argument for repayment, rests on a mechanism the evidence does not support, and is better understood as an argument for crisis financing. The article specifies the tests that would settle the remaining ambiguity and identifies where the data fall short.

Keywords: - Sovereign Default, Debt Restructuring, Trade Credit, Enforcement, Trade Finance, Imported Inputs, Paris Club, Debt Sustainability.

I. INTRODUCTION

Sovereign debt presents a puzzle that ordinary debt does not. There is no bailiff. A sovereign that repudiates its obligations cannot be liquidated, its territory cannot be seized, and cross-border enforcement is slow, partial, and frequently unavailable. Yet sovereigns overwhelmingly do repay, and the question of why has occupied a literature running from the foundational treatments onward (Bulow & Rogoff, 1989; Eaton & Fernandez, 1995; Panizza et al., 2009).

Two families of answer exist. Reputation models hold that default forecloses future market access, so the borrower repays to preserve it. Direct-cost models hold that default triggers tangible penalties in the present, of which the most frequently invoked is disruption to international trade. The empirical foundation for the second family was laid by Rose (2005), who used a gravity framework and Paris Club restructuring dates across fifty years and a large panel of partners to show that renegotiation is followed by a decline in bilateral trade between debtor and creditors of approximately eight percent a year, persisting for around fifteen years. The magnitude and persistence are striking, and the finding has been widely read as evidence that the threat to trade is what sustains repayment.

Rose himself was careful to note that two mechanisms could generate the pattern: creditors may be deterring default deliberately, or trade finance may simply dry up after default. That distinction has never been fully resolved, and it has often been elided in subsequent discussion, where the correlation is treated as though the punishment interpretation followed from it. The distinction is not semantic. If the trade decline is punishment, it is an equilibrium object. It exists because creditors want

it to, it is part of the implicit contract that makes lending possible, and removing it would reduce the willingness to lend. Attempts to shield defaulters from trade losses would be attempts to dismantle the enforcement mechanism, and would raise borrowing costs *ex ante*. If instead the decline is disruption, it is a market failure. Nobody chose it, it destroys value on both sides, it makes the defaulter less able to service any restructured claim, and eliminating it would improve outcomes for debtor and creditor alike.

This article reviews the accumulated evidence and argues that the disruption reading is the better supported one. Section 3 sets out why trade entered the enforcement literature at all. Section 4 assembles the empirical record. Section 5 distinguishes three candidate mechanisms and Section 6 weighs them. Sections 7 through 9 draw out what follows for the theory of enforcement, for what the evidence cannot yet settle, and for policy, including the uncomfortable observation that a claim widely used in debt negotiations rests on a mechanism the literature has largely abandoned.

II. METHOD OF THE REVIEW

The corpus was assembled through a structured search across EconLit, Scopus, Web of Science, RePEc/IDEAS, and SSRN, together with the working paper series of the International Monetary Fund, the World Bank, and the National Bureau of Economic Research. The search combined two required term blocks, "sovereign default" OR "sovereign debt" OR "debt restructuring" OR "debt renegotiation" and trade OR exports OR imports OR "trade credit" OR "trade finance", with a third block, cost OR punishment OR sanction OR enforcement OR output, used to identify the costs-of-default sub-corpus.

The window ran from 1989 to 2026, beginning with Bulow and Rogoff (1989) because that paper established the enforcement problem in the form the subsequent literature addresses. Inclusion required peer-reviewed publication or circulation in a recognised institutional series, together with either empirical estimation of post-default outcomes or a formal model in which the enforcement mechanism is explicit. Purely legal analyses of restructuring procedure were excluded except where they bear directly on the mechanism question. Backward and forward citation chaining was applied to the most-cited retained items, which brought in the trade finance literature that keyword search on debt terms alone does not reach.

No effect-size pooling was attempted. The estimates in the corpus differ in their treatment variable, since some use Paris Club dates, others use rating-agency default definitions, and others distinguish hard from soft default, and pooling across these would average over the very heterogeneity that Section 6 argues is informative.

III. WHY TRADE ENTERED THE ENFORCEMENT PROBLEM

The enforcement literature begins from an impossibility. Bulow and Rogoff (1989) showed that reputation alone cannot sustain sovereign lending when the borrower can save abroad, because a defaulter can replicate the insurance value of continued borrowing through asset accumulation. If reputation is insufficient, something else must be doing the work, and attention turned to direct costs: penalties incurred in the present rather than opportunities forgone in the future.

Trade was an attractive candidate for three reasons. It is large relative to the debts at issue, so a modest proportional loss can outweigh the gain from repudiation. It is observable, unlike the shadowy reputational penalty. And it is plausibly under creditor influence, since creditor governments control export credit agencies, trade finance guarantees, and, in principle, market access. Rose (2005) supplied the empirical fact the theory needed, and the direct-cost family gained its most cited support. Quantitative sovereign default models that generate realistic default frequencies and spreads typically require some such cost to make repayment attractive at observed debt levels, since the reputational channel alone generates too much default (Arellano, 2008).

It is worth being explicit about what the theory needs from the mechanism, because Section 7 turns on it. For a cost to function as an enforcement device, it must be anticipated, it must be attributable to the act of default rather than to the circumstances surrounding it, and it must not be something the debtor and creditor would jointly wish to eliminate. Disruption fails the third condition, and possibly the second.

IV. THE EMPIRICAL RECORD

4.1. The Trade Decline

The core finding is Rose's, described above: approximately eight percent per year, persisting around fifteen years, in bilateral trade between the defaulting sovereign and its creditor countries (Rose, 2005). The bilateral structure is important. The estimate is not of a general collapse in the defaulter's trade but of a decline specific to the creditor pairs, which is precisely the pattern a targeted punishment would generate and is the reason the punishment reading gained traction.

4.2. The Wider Cost Estimates

Broader assessments find default costs to be real but more modest and shorter-lived than the trade estimate alone implies, with output effects concentrated in the first years and substantial heterogeneity across episodes (Borensztein & Panizza, 2009; Panizza et al., 2009). Distinguishing hard from soft default sharpens the picture: outright repudiation is followed by materially worse output outcomes than pre-emptive or negotiated restructuring, indicating that the cost depends on how default is executed rather than on the fact of it (Trebesch & Zabel, 2017). Market penalties likewise scale with the severity of the terms imposed, with larger creditor haircuts followed by higher subsequent borrowing spreads and longer exclusion (Cruces & Trebesch, 2013).

That gradation is the first substantive problem for the punishment reading. A retaliation mechanism operating through creditor governments would be expected to respond to the fact of non-payment. A disruption mechanism operating through financial relationships would be expected to scale with how much value was destroyed and how much acrimony was generated, which is what the evidence shows.

4.3. Firm-Level and Sectoral Evidence

The most informative evidence for the mechanism question is disaggregated. Borensztein and Panizza (2009) find that default costs fall disproportionately on export-oriented sectors, and interpret this as consistent with a trade-credit channel rather than with retaliation. Hébert and Schreger (2017), using high-frequency equity price responses to Argentine legal rulings, identify the causal effect of default risk on firm values and find declines concentrated in ways that trace to financial conditions rather than to market access restrictions.

Evidence from large crises more generally shows that trade adjustment operates substantially through imported input access and firm-level disruption rather than through demand alone (Gopinath & Neiman, 2014). This matters because it establishes that the input channel is quantitatively significant in exactly the circumstances that accompany sovereign default.

4.4. The Sanctions that are Not There

The punishment reading requires an instrument. Systematic evidence of direct trade sanctions following sovereign default is, however, essentially absent. Martinez and Sandleris (2011) address the question directly and find that the post-default trade decline does not follow the pattern that creditor retaliation would produce: it is not concentrated in the bilateral relationships where a punishing creditor would have leverage, and it appears in trade with countries that had no claim to enforce. This is the strongest single piece of evidence in the debate, and it is negative evidence of an unusually clean kind. The punishment hypothesis makes a specific prediction about where the decline should fall. The prediction fails.

V. THREE CANDIDATE MECHANISMS

5.1. Direct Sanctions

Creditor governments restrict market access, withdraw export credit agency cover, or otherwise retaliate. Prediction: decline concentrated in creditor bilateral pairs, responsive to the fact of default, invariant to how the default was executed, and absent in trade with non-creditors.

Status: not supported. The bilateral concentration that Rose (2005) documented is real but is equally consistent with the financial mechanisms below, since creditor countries are also the countries whose banks provide the defaulter's trade finance. The distinguishing predictions fail (Martinez & Sandleris, 2011).

5.2. Financial Disruption Through Trade Credit

Default impairs the banks and the correspondent relationships through which trade is financed. Trade is credit-intensive and its instruments are supplied by a concentrated and geographically specialised set of institutions, so that impairment propagates directly to trade volumes (Niepmann & Schmidt-Eisenlohr, 2017). Payment terms shift towards cash-in-advance as counterparty and country risk rise, transferring the financing burden to parties least able to bear it (Antràs & Foley, 2015; Schmidt-Eisenlohr, 2013). Domestic banks holding defaulted sovereign paper suffer balance-sheet losses that contract private lending, a channel documented in the sovereign-bank nexus literature (Gennaioli et al., 2014). Sectors dependent on external finance and holding few collateralisable assets suffer most, which is the same gradient found in the 2008 to 2009 trade collapse (Chor & Manova, 2012; Manova, 2013).

Prediction: decline concentrated in externally-finance-dependent sectors; scaling with the severity of financial disruption rather than with the fact of default; present in trade with non-creditors whose banks are nonetheless affected; and attenuated where alternative financing is available.

Status: well supported on every dimension the evidence reaches.

5.3. Input Access and Productivity

Mendoza and Yue (2012) supply the general equilibrium mechanism. In their model, default cuts firms off from the working capital needed to purchase imported inputs, forcing substitution towards inferior domestic substitutes and lowering measured total factor productivity. Output falls not because anyone is punishing the country but because its producers are using worse inputs. The model reproduces the joint dynamics of default, spreads, output, and trade that reduced-form work documents, without any retaliation.

This is the theoretical counterpart to the disruption reading, and its importance is that it closes the loop. A critic of the disruption view could argue that trade credit withdrawal is a second-order friction unlikely to generate declines of the observed magnitude and persistence. Mendoza and Yue show that once the input channel is included, it can.

Prediction: decline concentrated in import-intensive production; observable as a productivity decline rather than solely as a demand or market-access effect; persistent, because input relationships and supplier networks take time to rebuild.

Status: supported theoretically and consistent with the crisis-adjustment evidence (Gopinath & Neiman, 2014).

VI. WEIGHING THE MECHANISMS

Table 1. Candidate mechanisms and their evidential status.

Mechanism	Distinguishing prediction	Key evidence	Status
Direct sanctions	Decline confined to creditor pairs; invariant to execution of default	Martinez and Sandleris (2011); absence of documented sanctions	Not supported
Trade credit withdrawal	Decline concentrated in externally-finance-dependent sectors; scales with financial disruption	Borensztein and Panizza (2009); Chor and Manova (2012); Niepmann and Schmidt-Eisenlohr (2017)	Supported

Sovereign-bank nexus	Domestic lending contraction where banks hold sovereign paper	Gennaioli et al. (2014); Hébert and Schreger (2017)	Supported
Imported input access	Productivity decline through input substitution; persistence via supplier networks	Mendoza and Yue (2012); Gopinath and Neiman (2014)	Supported
Execution-dependence	Worse outcomes for hard than soft default	Trebesch and Zabel (2017); Cruces and Trebesch (2013)	Supported, and inconsistent with pure punishment

Three observations follow from the table. First, the punishment mechanism is the only one for which the distinguishing prediction has been tested and failed. The others have been tested and passed, or have not been separately tested but rest on mechanisms independently documented in adjacent literatures.

Second, the bilateral concentration that made the punishment reading attractive is not diagnostic, because creditor countries and trade finance provider countries are largely the same countries. A defaulter loses trade disproportionately with the states whose banks financed that trade, and this is what a disruption mechanism predicts as much as a retaliation mechanism does. The original finding is therefore consistent with both readings, and the discriminating evidence lies elsewhere.

Third, the execution-dependence result is difficult for the punishment reading to accommodate. If trade loss were an enforcement device, creditors would have an interest in applying it predictably and in proportion to the shortfall, since an unpredictable penalty enforces poorly. That the loss instead varies with whether default was pre-emptive or disorderly, and with the acrimony of the process, is the signature of value destroyed in the process rather than value withheld as a sanction.

VII. CONSEQUENCES FOR THE THEORY OF ENFORCEMENT

If trade costs are disruption rather than punishment, the enforcement literature loses a mechanism it has leaned on, and the loss is not easily absorbed. The immediate problem is that disruption costs are jointly undesirable. Creditor and debtor both prefer that the defaulter's producers retain access to inputs and trade credit, since a defaulter with a functioning tradable sector services a restructured claim better than one without. A cost both parties wish to eliminate cannot serve as the thing that makes the contract enforceable, because both parties have an incentive to contract around it, and the machinery of restructuring is in substantial part an attempt to do exactly that.

There is a subtler difficulty concerning attribution. Enforcement requires that the cost follow from the act of default. Disruption costs follow from the circumstances that produce default and from the manner of its execution, which means they are partly endogenous to the crisis rather than to the decision. A sovereign contemplating default is not choosing between repayment and a known penalty; it is choosing between two paths through a crisis it is already in. That is a weaker deterrent than the models require.

Where does this leave the theory? Three possibilities deserve attention, and the literature has not settled among them. The reputational channel may be stronger than Bulow and Rogoff (1989) allowed, particularly where secondary markets and domestic creditor holdings alter the calculus (Broner et al., 2010). Domestic costs operating through the banking system may substitute for external ones, in which case enforcement is enforced by the sovereign's own financial system rather than by foreign creditors (Gennaioli et al., 2014). Or the observed pattern of repayment may reflect the fact that the choice is rarely presented starkly, since restructuring is usually negotiated and partial, and the discrete default of the models is a poor description of what actually happens (Cruces & Trebesch, 2013; Trebesch & Zabel, 2017). The point for present purposes is narrower. The trade channel has functioned as the empirically best-documented direct cost, and the documentation does not support the interpretation the theory required.

VIII. WHAT THE EVIDENCE CANNOT SETTLE

8.1. Attribution of the Counterfactual

Defaults do not occur randomly. Countries default amid recessions, currency crises, and political disruption, all of which reduce trade independently. Event-study designs and gravity specifications with pair fixed effects mitigate this but cannot eliminate it, and the persistence of the estimated decline is particularly vulnerable, since the conditions producing default are themselves persistent.

8.2. Absence of Evidence on Sanctions

The finding that direct sanctions are undocumented is strong but is not the same as a finding that they do not occur. Informal pressure on export credit agencies or on banks would leave little trace in the datasets used.

8.3. Instrument-Level Data

The trade credit mechanism is inferred from sectoral financial-dependence gradients rather than observed directly. Corridor-level data on letters of credit and correspondent relationships around default episodes would test it head-on, and such data now exist but have not been applied to this question.

8.4. Heterogeneity Across Defaults

Estimates pool episodes differing in creditor composition, in whether the debt was owed to official or private creditors, and in the legal regime. The rise of non-Paris Club official lending in recent decades makes the pooled historical estimate an uncertain guide to contemporary episodes.

8.5. Contemporary Relevance

The current wave of distress in low-income and lower-middle-income sovereigns is unfolding against a trade finance environment in which unmet demand is already estimated in the trillions and is concentrated in exactly the countries now at risk (Asian Development Bank, 2025). Whether default in such an environment produces larger trade costs, because the buffer is thinner, or smaller ones, because trade finance was already scarce, is an open and pressing question.

IX. POLICY IMPLICATIONS

9.1. Restructuring Architecture should aim to Protect the Trade Circuit Explicitly

If trade losses are disruption, they are deadweight, and preserving trade credit lines through a restructuring raises the value available to creditors as well as to the debtor. Trade credit has often been afforded informal seniority in practice; the argument here is that this practice has a firmer economic rationale than it is usually given, and that formalising it would be efficiency-improving rather than a concession to the debtor.

9.2. Trade Finance Backstops belong in Crisis Response

Multilateral guarantee capacity deployed during restructuring addresses the mechanism directly. The case for it does not depend on charity or on burden-sharing arguments; it depends on the claim that the trade collapse destroys value that would otherwise be available to service restructured claims. That claim follows from the disruption reading and not from the punishment reading.

9.3. The Execution of Default Matters More Than the Fact of it

The evidence that pre-emptive and negotiated restructurings carry materially lower costs than disorderly ones (Trebesch & Zabel, 2017) is actionable. It argues for earlier engagement, for restructuring frameworks that reduce holdout delay, and against strategies that postpone recognition of insolvency, since delay converts a soft default into a hard one.

9.4. The Negotiating Rhetoric Should Be Corrected

In debt negotiations the prospect of trade collapse is regularly invoked as a reason to repay. On the evidence reviewed here, that prospect is real but is not a penalty the creditor is imposing and could withhold. It is a consequence of financial disruption that both parties would prefer to avoid. Presented accurately, the same fact is an argument for arranging trade finance support alongside a restructuring rather than an argument for avoiding the restructuring, and the difference between those two conclusions is substantial for countries currently making the decision.

9.5. Debt Sustainability Analysis Should Model the Channel Rather than Assume It

Frameworks that embed a default cost as a reduced-form output loss are implicitly taking a position on the mechanism. If the loss runs through imported inputs and trade credit (Mendoza & Yue, 2012), then it is a function of import intensity and financial depth and varies enormously across countries, rather than being the common parameter that standard practice applies.

X. CONCLUSION

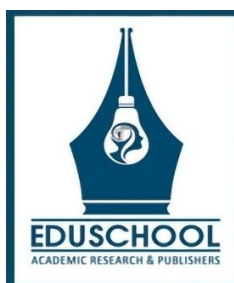
Trade falls after sovereign default. Whether it falls because someone is pushing or because something has broken is a question the literature posed clearly at the outset and then allowed to blur, and the blurring has had consequences. The evidence assembled here points to breakage. Direct sanctions are undocumented and the prediction that identifies them fails when tested. The decline concentrates where financial dependence is greatest, scales with the severity and disorder of the episode rather than with the fact of non-payment, and appears in relationships where no creditor has anything to enforce. A general equilibrium mechanism running through working capital for imported inputs reproduces the observed dynamics without invoking retaliation at all.

The theoretical cost of this conclusion is real: the enforcement literature loses its best-documented direct penalty, and the substitutes have known weaknesses. The practical gain is larger. A cost that nobody wants is a cost that can be reduced, and reducing it makes both the defaulting sovereign and its creditors better off. That reframing turns the trade consequences of default from an argument against restructuring into an argument for financing it properly, which is a conclusion of some urgency for the substantial number of sovereigns currently deciding which path through their debt problems to take.

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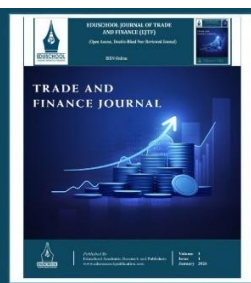
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EDUSCHOOL JOURNAL OF TRADE AND FINANCE (EJTF)

(Open Access, Double-Blind Peer Reviewed Journal)

ISSN Online:



Trade Policy Uncertainty, Financial Frictions, and the Sources of Export Hysteresis

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Article information

Received: 6th March 2026

Received in revised form: 3rd April 2026

Accepted: 8th May 2026

Available online : 11th June 2026

Volume: 1

Issue: 1

DOI: <https://doi.org/10.5281/zenodo.21886364>

Abstract

Firms that could profitably export often do not, and firms that stop exporting often fail to return when conditions improve. Two literatures explain this hysteresis through different frictions. The real options literature holds that entry is irreversible and that uncertainty about future trade policy creates an option value of waiting, so firms delay entry even when current expected profits are positive. The financial frictions literature holds that entry requires sunk expenditure that constrained firms cannot fund, so they do not enter regardless of what they expect. The two produce observationally similar reduced forms, and empirical work has often been unable to separate them. This article argues that the failure to separate them has consequences, because the implied remedies are not merely different but are frequently treated as substitutes when they are complements. Binding trade agreements address uncertainty and do nothing for a firm that cannot raise the entry capital. Trade finance facilities address constraints and do nothing for a firm that is rationally waiting. The article's central claim is that the two frictions compound rather than add: uncertainty raises the return a lender requires on sunk-cost lending, tightening the constraint, while the constraint removes the firm's ability to exercise its option when uncertainty resolves favourably, so the option becomes worthless precisely when it should pay off. Under this reading, the standard practice of estimating one channel while treating the other as background does not merely omit a term. It biases the estimated magnitude of whichever channel is measured, in a direction that depends on the correlation between policy volatility and financial development across the sample. The article specifies the evidence that would separate the channels, argues that most of it already exists in unlinked datasets, and draws out the policy consequences of continued conflation.

Keywords: - Trade Policy Uncertainty, Real Options, Sunk Entry Costs, Export Hysteresis, Credit Constraints, Trade Finance, Trade Agreements, Firm Dynamics.

I. INTRODUCTION

The decision to export is not a decision about this year's profits. It is an investment. Establishing a distribution network, meeting foreign regulatory standards, adapting products, and building buyer relationships all require expenditure that is sunk before any revenue arrives, and the evidence that these costs are large and that they generate persistence in export status is among the most robust in the firm-level trade literature (Das et al., 2007; Roberts & Tybout, 1997). Once entry is understood as investment under irreversibility, two classical results follow immediately, and they have generated two largely separate research programmes.

The first is that irreversibility plus uncertainty generates an option value of waiting. A firm facing an uncertain future policy environment will rationally decline an investment with positive expected net present value, because delaying preserves the option to invest after learning more, and that option has value the standard net present value calculation ignores (Bernanke, 1983; Dixit, 1989). Applied to trade, this predicts that the mere possibility of future protection suppresses entry even when current tariffs are low, and that removing the possibility is valuable independently of removing the tariff (Handley, 2014; Handley & Limão, 2017). The empirical payoff has been substantial: the reduction in the threat of a trade war following China's

accession to the World Trade Organization accounts for more than a third of Chinese export growth to the United States between 2000 and 2005, and delivered a welfare gain to United States consumers equivalent to a permanent tariff reduction of 13 percentage points (Handley & Limão, 2017).

The second result is that sunk costs must be financed. A firm that cannot borrow against future export profits will not enter, whatever its expectations, and the friction operates on both the extensive and intensive margins of trade (Manova, 2013; Melitz, 2003). This literature has established that financially developed economies acquire comparative advantage in sectors dependent on external finance, that credit conditions shaped the pattern of the 2008 to 2009 trade collapse across financially vulnerable sectors (Chor & Manova, 2012), and that shocks to the supply of trade-specific financial instruments reduce exports to affected destinations (Niepmann & Schmidt-Eisenlohr, 2017).

Both literatures explain the same phenomenon: too little export entry relative to what a frictionless model predicts, and persistence in whoever happens to be exporting already. Both generate the same broad empirical signature, namely muted responsiveness of entry to current profitability. And both have been estimated largely in isolation, with the other friction relegated to a control variable or to a sentence in the limitations.

This article argues that the separation is no longer defensible, for a reason more consequential than tidiness. The two frictions are not additive. Section 6 sets out the argument in full, but the intuition is short. A lender asked to finance sunk, non-collateralisable entry expenditure faces the same irreversibility the firm does, and prices the same uncertainty. Higher policy uncertainty therefore tightens the financing constraint at the same moment that it raises the option value of waiting. Conversely, a firm that is credit-constrained cannot exercise its option when uncertainty resolves favourably, which strips the option of the value that justified waiting in the first place. Each friction amplifies the other, and estimating either in isolation attributes part of the interaction to whichever is being measured.

The stakes are practical. Trade agreements are, on the option-value reading, valuable primarily because they bind policy and remove the tail of protection, which is why they can deliver welfare gains far exceeding their tariff content (Handley & Limão, 2017, 2022). Trade finance facilities are valuable because they relax constraints. Institutions treat these as separate policy tracks addressed by separate bodies. If the frictions compound, the returns to each are increasing in the other, and the sequencing question that neither literature poses becomes the important one.

II. METHOD OF THE REVIEW

The corpus was assembled through a structured search across EconLit, Scopus, Web of Science, RePEc/IDEAS, and SSRN, together with the working paper series of the National Bureau of Economic Research, the Federal Reserve System, and the World Bank. The search combined three term blocks: first, "trade policy uncertainty" OR "policy uncertainty" OR "real option" OR "irreversibility" OR "sunk cost"; second, export OR "export entry" OR "extensive margin" OR "firm dynamics"; third, "credit constraint" OR "financial friction" OR "trade finance" OR "external finance dependence". The first two blocks were required conjunctively. The third delimited the financial-frictions sub-corpus and, separately, was combined with the first two to identify the small set of studies attempting joint treatment.

The window ran from 1983 to 2026, beginning with Bernanke (1983) because that paper established the irreversibility result on which the entire option-value branch depends. Inclusion required peer-reviewed publication or circulation in a recognised institutional series, together with an identified mechanism operating on export participation or volumes. Studies of uncertainty and domestic investment were included only where the mechanism transfers directly to export entry, since the general uncertainty literature is far too large to review here and is well surveyed elsewhere (Bloom, 2014).

Because the argument of this article concerns the interaction of two mechanisms rather than the magnitude of either, no effect-size pooling was attempted. Pooling would be actively misleading in this setting: if the interaction argued for in Section 6 exists, then estimates of each channel are contaminated by the other in sample-specific ways, and averaging contaminated estimates produces a more precise contaminated estimate rather than a cleaner one.

III. TWO THEORIES OF THE SAME FACT

3.1. Hysteresis as a Stylised Fact

Export status is highly persistent. Firms that exported last year are overwhelmingly likely to export this year, and entry and exit rates are far lower than variation in profitability would imply under frictionless entry. Structural estimation of entry costs from Colombian data confirms that sunk costs are large, that they generate the observed persistence, and that they imply substantial heterogeneity in which firms respond to any given incentive (Das et al., 2007; Roberts & Tybout, 1997). The classic macroeconomic version of the same observation is that large exchange rate movements leave permanent traces on trade patterns, because entrants who sank costs during an episode do not exit when it reverses (Baldwin & Krugman, 1989). Any adequate theory must explain both the low entry rate and the failure to exit, and both candidate theories do.

3.2. The Real Options Account

Under irreversibility, the decision to invest is the decision to kill an option. The firm should invest only when expected profit exceeds the direct cost plus the value of the option surrendered, and that option value rises with the volatility of the underlying process (Bernanke, 1983; Dixit, 1989). Uncertainty therefore suppresses investment even when it is mean-preserving, and it does so most powerfully where irreversibility is greatest. Aggregate uncertainty shocks produce sharp contractions in activity through exactly this channel, along with a subsequent overshoot as pent-up decisions are executed (Bloom, 2009).

The trade application is direct. Handley (2014) formalises export entry under trade policy uncertainty and shows that binding tariff commitments raise entry even when applied tariffs are unchanged, because they truncate the distribution of future protection. Handley and Limão (2017) embed this in general equilibrium and quantify it. The mechanism explains a puzzle that tariff-level analysis cannot: why accession to a trade agreement produces trade growth out of proportion to the tariff changes it delivers, and why the value of an agreement lies substantially in what it forecloses rather than in what it currently does.

3.3. The Financial Frictions Account

Under credit constraints, the firm's problem is not option value but liquidity. Sunk entry expenditure is largely non-collateralisable, being composed of market research, relationship formation, and regulatory compliance rather than tangible assets, which makes it exactly the sort of expenditure external finance is least willing to fund. Firms below a wealth or pledgeable-income threshold therefore do not enter regardless of expectations, and the resulting selection is on financial capacity rather than on productivity alone (Manova, 2013; Melitz, 2003).

The empirical support is extensive and is reviewed in Section 5. What matters here is the structural point: this account also generates low entry, high persistence, and muted responsiveness to profitability, because the constrained firm's entry decision is insensitive to expected profit over the relevant range. The two theories are observationally close by construction.

3.4. Where they diverge

Three divergences are exploitable.

- Response to mean-preserving spreads. The option-value account predicts that a mean-preserving increase in policy volatility suppresses entry. The pure credit-constraint account predicts no effect, since expected profitability is unchanged and the constraint binds on the level of required funds rather than on their variance. This is the cleanest theoretical separation available.
- Response to resolution. When uncertainty resolves favourably, the option-value account predicts a burst of delayed entry, the overshoot documented in the aggregate uncertainty literature (Bloom, 2009). The credit-constraint account predicts no such burst, because the constrained firm was never waiting.
- Cross-sectional incidence. Option value should bind hardest where irreversibility is greatest, which correlates with relationship specificity and product adaptation intensity. Constraints should bind hardest where firms are small, young, and low in tangible assets, and where the domestic financial system is shallow (Beck et al., 2005). These correlates are distinct, though not orthogonal.

IV. EVIDENCE ON THE UNCERTAINTY CHANNEL

4.1. Measurement

Progress in this literature followed measurement. Newspaper-based indices of economic policy uncertainty made the concept operational at the macroeconomic level (Baker et al., 2016), and trade-specific measures followed, constructed from newspaper coverage, from firms' earnings conference calls, and from the structure of tariff commitments themselves (Caldara et al., 2020). The earnings-call measure is particularly useful for the argument of this article, because it varies at firm level and therefore permits interaction with firm financial characteristics, which aggregate indices cannot support.

4.2. Magnitudes

The estimated effects are large. Trade policy uncertainty reduced United States business investment by approximately 1.5 percent in 2018, with effects identified in both firm-level and aggregate data and rationalised through a two-country general equilibrium model with export participation decisions (Caldara et al., 2020). The China accession estimates, cited in Section 1, imply that uncertainty reduction accounted for over a third of a major export boom (Handley & Limão, 2017). Brexit provides a further natural experiment in which uncertainty alone, absent any tariff change, depressed trade, with effects extending beyond the directly affected pair (Graziano et al., 2021).

The realised-tariff literature supplies the counterpoint that makes these magnitudes interpretable. The 2018 and 2019 tariff episode produced near-complete pass-through to domestic prices, with substantial aggregate welfare losses (Amiti et al., 2019; Fajgelbaum et al., 2020), and generated global reallocation of trade flows towards third countries (Fajgelbaum et al., 2024). Comparing the uncertainty estimates to the realised-tariff estimates shows that the anticipation of protection can cost a comparable order of magnitude to protection itself, which is the central policy claim of the uncertainty programme and is reviewed in full by Handley and Limão (2022).

4.3. What this Literature Does Not Do

With few exceptions it does not condition on financial capacity. Firms are heterogeneous in productivity in these models, and increasingly in export participation status, but they are not heterogeneous in their ability to fund entry. The representative firm in an option-value model can always execute when it decides to. Since the models assume away the constraint, the estimates cannot speak to its interaction with uncertainty, and any such interaction present in the data is absorbed into the estimated uncertainty coefficient.

5. EVIDENCE ON THE FINANCIAL CHANNEL

5.1. Constraints and the Pattern of Trade

Credit constraints shape both the volume and the composition of trade. Financially developed countries hold comparative advantage in financially vulnerable sectors, and constraints operate on entry as well as on scale (Manova, 2013). Firm size and age are strong predictors of financing and legal obstacles to growth, which is the structural reason small firms are systematically under-represented among exporters (Beck et al., 2005). During the 2008 to 2009 collapse, countries facing tighter credit conditions exported less, with the effect concentrated in sectors requiring extensive external finance, holding few collateralisable assets, or lacking access to trade credit (Chor & Manova, 2012).

5.2. Trade-Specific Finance

Trade has its own financial instruments, and their supply is neither elastic nor evenly distributed. Payment terms are chosen jointly with financing arrangements and substitute for weak contract enforcement, with cash-in-advance dominating in weakly enforcing destinations and terms relaxing as relationships mature (Antràs & Foley, 2015; Schmidt-Eisenlohr, 2013). The supply of bank guarantees is concentrated and geographically specialised, so that shocks to individual banks propagate to corridor-level trade: a one standard deviation negative shock to a destination's letter-of-credit supply reduces exports to that destination by approximately 1.5 percentage points, an effect concentrated in small and thinly banked destinations and more than doubling in crisis conditions (Niepmann & Schmidt-Eisenlohr, 2017).

That last figure deserves emphasis alongside the 1.5 percent investment effect of trade policy uncertainty reported in Section 4.2. The two are not directly comparable in units, but they are comparable in the sense that matters here: neither is a rounding error, and any framework that treats one as first-order and the other as background is making an assumption rather than reporting a finding.

5.3. What this Literature does not do

Symmetrically, it does not model the option value of waiting. Constrained firms in these models want to enter and cannot. The possibility that an unconstrained firm might decline to enter because the policy environment is volatile does not arise, and where entry fails to respond to a relaxation of constraints, the residual is typically attributed to unmeasured fixed costs rather than to rational delay.

VI. WHY THE FRICTIONS COMPOUND

6.1. The Lender holds an Option too

The core of the argument is that irreversibility is a property of the expenditure, not of the borrower, and it is therefore priced by whoever bears the risk. A bank asked to lend against sunk export entry costs is financing an asset with negligible liquidation value in a market whose future access is uncertain. Higher trade policy uncertainty raises the variance of the borrower's future cash flows, raises the probability of the states in which the loan is not repaid, and does so for an exposure that cannot be recovered through collateral. The lender's required return rises accordingly.

This is the general mechanism by which uncertainty and financial frictions interact in the investment literature, where uncertainty shocks amplify through credit spreads rather than operating solely through the firm's own option calculus (Arellano et al., 2019; Gilchrist et al., 2014). Its application to export entry is direct and, so far as this review can establish, has not been made explicitly. The consequence is that the financing constraint on export entry is not a fixed parameter of the financial system. It tightens when policy becomes volatile, which is precisely when the option-value literature says entry should fall for independent reasons.

6.2. The Constrained Firm's Option is Worth Less

The reverse interaction is equally direct and, if anything, sharper. The option-value logic assumes the firm can exercise when it chooses. A credit-constrained firm cannot. When uncertainty resolves favourably and the moment to enter arrives, the constrained firm faces the same funding problem it faced before, and the option it was preserving turns out to have been unexercisable.

This has an implication that neither literature states. For a constrained firm, waiting is not optimal delay; it is simply exclusion described in the vocabulary of choice. The observed "delay" of such firms should not be counted as evidence for the option-value mechanism, yet in aggregate or country-level data it is indistinguishable from it. Where financially constrained firms are numerous, which is to say in most developing economies, estimates of the uncertainty channel will absorb a portion of the constraint channel.

6.3. The Direction of the Resulting Bias

The bias is not sign-ambiguous once the sample is specified. In a sample of countries or firms where policy volatility is positively correlated with financial underdevelopment, which describes the typical developing-country cross-section, an estimate of the uncertainty channel that omits financial capacity will be biased away from zero, because part of what is attributed to rational waiting is inability to move. Symmetrically, an estimate of the constraint channel that omits uncertainty will be biased away from zero in the same samples, because part of what is attributed to constraints is rational waiting by unconstrained firms. The two literatures therefore each overstate their own mechanism in exactly the settings where the policy

stakes are highest, and their estimates cannot be added together to produce a total, since doing so would double-count the interaction.

6.4. Summary of the corpus

Table 1. Principal evidence by channel and by treatment of the other friction.

Study	Primary channel	Level of evidence	Treatment of the other friction	Headline magnitude
Handley and Limão (2017)	Uncertainty	Firm entry in general equilibrium; China to United States	Not modelled	Over one-third of 2000 to 2005 export growth; welfare gain equal to 13 percentage point permanent tariff cut
Handley (2014)	Uncertainty	Firm-level export entry	Not modelled	Binding commitments raise entry with applied tariffs unchanged
Caldara et al. (2020)	Uncertainty	Firm-level and aggregate United States	Not modelled	Investment reduced by about 1.5 percent in 2018
Graziano et al. (2021)	Uncertainty	Bilateral trade around Brexit referendum	Not modelled	Trade depressed absent any tariff change
Manova (2013)	Financial	Country-sector trade patterns	Uncertainty not modelled	Credit constraints affect both margins; financial development confers comparative advantage
Chor and Manova (2012)	Financial	Country-sector monthly United States imports	Uncertainty not modelled	Tighter credit reduced exports, concentrated in financially vulnerable sectors
Niepmann and Schmidt-Eisenlohr (2017)	Financial (instrument supply)	Bank-corridor	Uncertainty not modelled	One standard deviation letter-of-credit supply shock reduces exports by about 1.5 percentage points
Das et al. (2007)	Sunk costs, neither friction isolated	Structural, Colombian plants	Both implicit in estimated entry cost	Entry costs large enough to generate observed persistence

The final column of Table 1 is the point of the table. Across the corpus, the friction not being studied is not controlled for imperfectly. It is absent from the model.

VII. WHAT WOULD SEPARATE THEM

The separation is achievable with data that largely exist but have not been linked.

7.1. Interact Firm-Level Uncertainty with Firm-Level Financial Capacity

The earnings-call measure of trade policy uncertainty varies across firms and over time (Caldara et al., 2020), and standard measures of financial constraint are available for the same firms. The interaction term is the object of interest, and its sign tests Section 6.1 directly. A negative interaction, meaning that uncertainty depresses entry more among constrained firms, is evidence of compounding; a positive interaction would suggest the frictions are substitutes, since a firm that cannot move is unaffected by the volatility of what it cannot do.

7.2. Exploit Resolution Events

Section 3.4 identified the burst of delayed entry following favourable resolution as a signature unique to the option-value mechanism. Comparing that burst across firms of differing financial capacity is a direct test of Section 6.2: if constrained firms fail to participate in the post-resolution entry surge, their prior inaction was exclusion rather than delay.

7.3. Use Mean-Preserving Variation

. The sharpest theoretical separation is that pure credit constraints should be insensitive to mean-preserving spreads in policy. Episodes that raise policy variance without shifting expected protection, of which the tariff-binding literature supplies several, therefore identify the option-value channel alone.

7.4. Link Credit Registry Data To Policy Uncertainty Exposure

Whether lenders reprice sunk-cost lending when trade policy uncertainty rises is the empirical content of Section 6.1 and is directly testable in matched bank-firm data, using the sectoral variation in exposure to threatened trade measures as the source of identification. None of this requires new data collection on a large scale. It requires linking datasets that currently sit in different literatures.

VIII. WHAT THE EVIDENCE CANNOT CURRENTLY SETTLE

8.1. Measurement Asymmetry

Trade policy uncertainty is measured with considerable sophistication at firm level; financial constraint is typically proxied by size, age, or tangibility, which are noisy and correlated with productivity. Any interaction estimate will therefore be attenuated on the financial side, biasing tests of Section 6 towards finding no interaction.

8.2. Endogeneity of Exposure

Firms choose which markets to serve and therefore which policy risks to bear, and constrained firms may select into stable markets for that reason. This selection generates a correlation between constraint and low uncertainty exposure that is the reverse of the compounding mechanism and could mask it.

8.3. Geographic Coverage

Both literatures draw disproportionately on data from the United States, Europe, and a small number of middle-income economies with usable registries. The settings where compounding should be strongest, namely economies with volatile trade policy and shallow financial systems, are the least represented.

8.4. Aggregation

Firm-level compounding need not aggregate, since exit of constrained firms reallocates market share to unconstrained ones. Whether the interaction survives aggregation is a quantitative question requiring a model, and no such model currently incorporates both frictions.

8.5. The Current Episode

The tariff environment since 2025 combines high realised tariffs with high uncertainty about their persistence, and its effects are unfolding within a broader reorganisation of trade along geopolitical lines (Aiyar et al., 2023; Alfaro & Chor, 2023). Whether firms are waiting, are unable to move, or are relocating is precisely the question this article says the literature cannot currently answer, and it is being asked in real time.

IX. POLICY IMPLICATIONS

9.1. Trade Agreements do more than Cut Tariffs, But not for Everyone

The option-value case for binding commitments is strong and quantitatively large (Handley, 2014; Handley & Limão, 2017, 2022). But its benefit accrues to firms positioned to respond when the tail risk is removed. For constrained firms, an agreement removes a risk they were not principally deterred by. Evaluations of agreements that assume a uniform entry response will overstate their inclusiveness even where they correctly estimate their aggregate effect.

9.2. Trade Finance Facilities are Worth more when Policy Is Volatile

If Section 6.1 is right, the cost of financing export entry rises with policy uncertainty, which means the marginal value of a public guarantee or risk-sharing facility is highest exactly when uncertainty is highest. Current practice, which sizes such facilities against structural gap estimates, does not index them to the policy environment. It should.

9.3. The Two Instruments are Complements

This is the practical payoff of the argument. An agreement without financing capacity leaves constrained firms where they were; financing capacity without an agreement funds entry into a market that may be closed by policy next year. Institutions currently treat trade negotiation and trade finance as separate mandates handled by separate bodies. If the frictions compound, the returns to each are increasing in the other, and coordination is not administrative tidiness but a first-order design question.

9.4. Uncertainty is a Policy Variable, not a State Of Nature

The distinction matters for how governments account for their own actions. The evidence that anticipation of protection is costly on an order comparable to protection itself (Caldara et al., 2020; Handley & Limão, 2017), set against the documented costs of realised tariffs (Amiti et al., 2019; Fajgelbaum et al., 2020, 2024), implies that the manner in which trade policy is announced, sequenced, and committed to is itself an economic instrument with measurable consequences.

X. CONCLUSION

Export hysteresis has two credible explanations, and the field has largely proceeded as though it had one at a time. Firms may be waiting, in which case volatility is the enemy and binding commitments are the remedy. Or they may be unable to move, in which case expectations are beside the point and financing is the remedy. The reduced forms are similar enough that either literature can account for the aggregate facts, which is precisely why each has been able to develop without confronting the other.

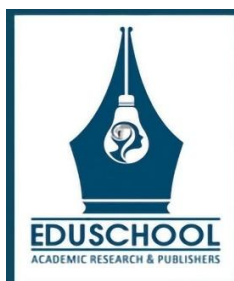
This article has argued that the frictions interact multiplicatively, through two channels that run in opposite directions and reinforce the same conclusion. Lenders price irreversibility too, so uncertainty tightens the constraint. And constrained

firms cannot exercise, so the constraint hollows out the option. The consequence is that estimates of each channel absorb part of the other, in a direction that is predictable once the sample is specified, and that the two cannot be summed to a total.

What follows is not primarily a call for better estimates, though better estimates would help and Section 7 describes how to obtain them from data already collected. It is a claim about policy architecture. The institutions that reduce trade policy uncertainty and the institutions that finance trade are treated as addressing separate problems. On the reading advanced here they are addressing two halves of one problem, and each is worth more when the other is present. That is a proposition the existing evidence neither establishes nor refutes, which is an unsatisfactory place for a question of this size to rest.

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Does a Strong Dollar Shrink World Trade? Reconciling the Pricing and Financial Channels of Dollar Transmission

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Article information

Received: 9th March 2026

Received in revised form: 2nd April 2026

Accepted: 6th May 2026

Available online: 11th June 2026

Volume: 1

Issue: 1

DOI: <https://doi.org/10.5281/zenodo.21900246>

Abstract

A weaker currency is supposed to raise exports. For most of world trade it does not, and the reason is now well understood in two separate literatures that have not been reconciled. The first holds that export prices are set in a single dominant currency, so that bilateral depreciation delivers little expenditure switching and what matters is the exporter's currency against the dollar. The second holds that the dollar is a barometer of global credit conditions, so that appreciation contracts the balance-sheet capacity of dollar-funded lenders and reduces the working capital on which trade runs. This article synthesises both literatures, evaluates their empirical claims against each other rather than in isolation, and argues three things. First, the mechanisms are separable on evidence already available, because they carry distinct signatures in destination composition, time profile, and cross-sectional incidence, and the destination test is decisive: the pricing channel predicts no contraction in exports to the United States, while the credit channel predicts contraction there too, and the observed contraction in United States-bound exports is therefore diagnostic. Second, the field's headline estimates are composites of the two mechanisms, weighted by an unmeasured and country-specific mix of invoicing dollarisation and funding dollarisation, which means they are not stable parameters and should not be used as such in forecasting or policy calibration. Third, the policy implications diverge sharply and are currently conflated: local currency settlement initiatives target the pricing channel alone, and in a world where firms may invoice in one currency while funding in another, such initiatives can reduce measured trade exposure to the dollar while leaving balance-sheet vulnerability essentially untouched. The article closes by specifying what evidence would settle the open questions and why existing data fall short of it.

Keywords: - Dominant Currency Pricing, Invoicing Currency, Broad Dollar Index, Global Financial Cycle, Export Elasticity, Currency Mismatch, De-Dollarisation, Emerging Markets.

I. INTRODUCTION

Few propositions in applied economics have been repeated as often, or acted on as confidently, as the claim that currency depreciation raises exports. It underwrites competitive devaluation, currency war rhetoric, a substantial portion of International Monetary Fund programme design, and the intuition of finance ministries across the developing world. The mechanism is expenditure switching: a cheaper domestic currency lowers the foreign-currency price of domestic goods, foreign buyers substitute towards them, and export volumes rise.

The mechanism depends on an assumption that is false for most of world trade. Prices are not set in the producer's currency. They are set overwhelmingly in one dominant currency, the United States dollar, in transactions that frequently involve no United States counterparty at all. The scale of this asymmetry is easily stated. Dollar invoicing in world imports runs at roughly 4.7 times the share of United States goods in those imports, whereas the equivalent ratio for the euro is approximately 1.2, and dollars constitute about 62 percent of the foreign currency local liabilities of non-United States banks (Gopinath & Stein, 2021). Comprehensive panel data covering 115 countries since 1990 confirm both the dollar's dominance and the remarkable stickiness of invoicing patterns over three decades (Boz et al., 2022). On the financial side, the dollar sits on one side of the large majority of foreign exchange transactions (Bank for International Settlements, 2022).

Once producer currency pricing is abandoned, the textbook prediction does not merely weaken. It can reverse. Two literatures have documented this reversal by different routes, and the substance of this article is that they have documented different things. The first, which may be called the pricing literature, establishes that under dollar invoicing the relevant exchange rate for trade quantities is the exporter's currency against the dollar rather than against the destination currency, and that the strength of the effect rises with the dollar invoicing share (Gopinath et al., 2020). The mechanism here is fundamentally about an absence. Expenditure switching does not happen because the invoice price has not moved. On its own this predicts muted responses to bilateral rates, not contractionary ones.

The second, which may be called the financial literature, supplies the contractionary force. The dollar functions as a barometer of global credit conditions because internationally active banks fund substantially in dollars and their risk-taking capacity moves inversely with dollar strength (Bruno & Shin, 2015). Following dollar appreciation, exporters more dependent on dollar-funded bank credit experience a contraction in credit and a slowdown in exports, including exports destined for the United States (Bruno & Shin, 2023). That last detail is the crux of this article's argument and is developed in Section 5.

These two accounts are typically described as complementary, and they are. But complementarity has been allowed to substitute for decomposition. The field reports composite elasticities and interprets them within whichever framework the authors are working in, while the relative weight of the two mechanisms is treated as though it were a global constant. There is no reason to expect that it is. A commodity exporter with near-universal dollar invoicing and shallow domestic credit markets occupies a different position in the parameter space from a manufacturing exporter with deep bank intermediation and diversified invoicing, and the two will respond differently to the same dollar movement for reasons that have nothing to do with sampling error.

The question has become urgent rather than merely tidy. Invoicing shares, long the most inert series in international macroeconomics, have begun to move, and the movement correlates with geopolitical alignment rather than with trade fundamentals alone (Boz et al., 2025), within a wider reorganisation of trade and financial linkages along bloc lines (Aiyar et al., 2023). If the pricing channel's strength is a function of the dollar invoicing share, and that share is now changing, then elasticities estimated under three decades of invoicing stability will misforecast. Whether the financial channel moves in step is a separate question with a non-obvious answer, and Section 7 argues that it probably does not, at least not on the same timescale.

This article does three things. Section 3 sets out why one currency dominates and why dominance in trade and dominance in banking are one phenomenon rather than two. Sections 4 and 5 assess the pricing and financial literatures on their own terms and extract their quantitative claims. Section 6 confronts them with each other and argues that they are separable on evidence largely already collected. Sections 7 through 9 examine the stability question, identify what the evidence cannot currently settle, and draw the policy distinctions that the conflation of the two channels has obscured.

II. METHOD OF THE REVIEW

The corpus was assembled through a structured search across EconLit, Scopus, Web of Science, RePEc/IDEAS, SSRN, and the working paper series of the International Monetary Fund, the Bank for International Settlements, the European Central Bank, and the Federal Reserve System. The search combined three term blocks: first, "dominant currency" OR "invoicing currency" OR "currency of invoicing" OR "dollar exchange rate" OR "broad dollar"; second, export OR trade OR "trade volumes" OR "pass-through" OR "trade elasticity"; third, credit OR "bank funding" OR "financial channel" OR "currency mismatch" OR "global financial cycle". The first two blocks were required conjunctively; the third delimited the financial-channel sub-corpus.

The window ran from 2001 to 2026. The start point is not arbitrary: Rey (2001) established the network-externality foundation on which the subsequent currency-dominance literature is built, and studies before that date address a different question, namely optimal currency choice under exogenous market structure rather than the endogenous emergence of dominance.

Inclusion required peer-reviewed publication or circulation in a recognised institutional working paper series, empirical or formal-theoretical content, and an identified mechanism linking currency to trade quantities rather than to prices alone. The last criterion excluded a substantial pass-through literature that is informative about price setting but silent on the volume responses at issue here. Purely descriptive reserve-composition studies and forecasting exercises without a structural mechanism were also excluded. Backward and forward citation chaining was applied to the ten most-cited retained items, which added several central contributions that keyword search alone missed, notably the working capital literature.

Because this is an interpretive synthesis rather than a meta-analysis, no effect-size pooling was attempted. Pooling would be inappropriate here for a substantive reason as well as a statistical one: the estimates in the corpus are not noisy measurements of a common parameter but measurements of different parameters in populations with different exposure mixes, which is precisely the argument of Section 6.

III. WHY ONE CURRENCY DOMINATES, AND WHY THAT MATTERS TWICE

3.1. The Coordination Foundation

Currency dominance is a coordination equilibrium sustained by network externalities. A currency is attractive to invoice in because others invoice in it, which generates thick markets, low transaction costs, and low hedging costs, which in turn makes it more attractive still (Rey, 2001). The equilibrium is self-reinforcing and therefore both stable and, in principle, multiple: nothing in the logic identifies which currency occupies the position.

Historical evidence supports the network account and clarifies its boundaries. In oil markets, where goods are homogeneous and the incentive to quote in the same unit as competitors is sharpest, network effects operate strongly and switching is correspondingly rare (Eichengreen et al., 2016). Firm-level evidence establishes that invoicing is a deliberate

strategic choice rather than an inherited convention: firms with larger imported input shares and those whose competitors invoice in dollars choose dollars themselves, and the choice materially alters both their pass-through and their exposure to exchange rate movements (Amiti et al., 2022). Bargaining-theoretic accounts locate the same choice in the relative market power of exporter and importer (Goldberg & Tille, 2016). The euro's persistent failure to contest dollar dominance despite broadly comparable economic fundamentals is exactly what the coordination logic predicts, and is difficult to explain on fundamentals alone (Ilzetzi et al., 2020).

3.2. The Link that Makes Dominance a Single Phenomenon

The contribution that transforms this from a trade story into a macro-financial one is Gopinath and Stein (2021). Their framework establishes that a currency's role as a unit of account for invoicing and its role as a safe store of value are mutually reinforcing rather than independent. Firms invoicing in dollars want dollar-denominated safe assets to hedge their receivables, which deepens the market for dollar safe claims and lowers the cost of dollar funding, which strengthens the incentive to invoice in dollars. The safe-asset premium that this mechanism relies upon is independently documented (Krishnamurthy & Vissing-Jorgensen, 2012).

Two consequences are decisive for what follows. First, firms in emerging market economies endogenously accept currency mismatch by borrowing in the dominant currency, and they do so as an equilibrium outcome rather than through error. Second, and more importantly for the argument of this article, dominance in trade invoicing and dominance in international banking are not two facts that happen to coincide. They are one fact with two observable faces. It follows that a dollar shock propagates through the pricing channel and the financial channel simultaneously, that the two channels' cross-sectional incidence is positively correlated by construction, and that any attempt to identify one while ignoring the other will attribute part of the second to the first. This is the analytical reason why decomposition has been difficult, and it is why Section 6 argues that decomposition must proceed through signatures other than cross-sectional exposure alone.

IV. THE PRICING CHANNEL

4.1. The Paradigm and its Evidence

Gopinath et al. (2020) formalise the dominant currency paradigm through three features: pricing in a dominant currency, pricing complementarities across competing firms, and imported input use in production. The last matters because it dampens the cost advantage that depreciation would otherwise confer, since a depreciating exporter's imported inputs become more expensive in local currency. The paradigm is tested on newly constructed bilateral price and volume indices spanning more than 2,500 country pairs and covering 91 percent of world trade, supplemented by firm-product-country data for Colombian exports and imports.

Four findings define the paradigm. Non-commodity terms of trade are uncorrelated with exchange rates, which is the single most direct refutation of producer currency pricing. The dollar exchange rate quantitatively dominates the bilateral rate in both pass-through and trade elasticity regressions, and the magnitude of this dominance rises with the share of imports invoiced in dollars, which is the paradigm's central testable prediction and its strongest confirmation. United States import volumes are significantly less sensitive to bilateral exchange rates than other countries' imports, as they must be if the invoice currency is the destination currency for that flow. And a one percent dollar appreciation against all other currencies predicts a decline of approximately 0.6 percent within a year in the volume of total trade between countries in the rest of the world. That last figure is the field's headline number and the object of this article's central caution. It is a reduced-form prediction, not a structural pricing elasticity, and Section 6 argues that it contains an unmeasured financial component.

4.2. Extensions and Open-Economy Consequences

The research programme is reviewed by Gopinath and Itskhoki (2022). Its macroeconomic consequences are substantial: under dominant currency pricing, the sign and magnitude of output spillovers from dollar appreciation differ from those implied by producer currency pricing, which changes the appropriate design of monetary policy and the terms of international policy coordination (Georgiadis & Schumann, 2021). For a country whose exports are largely dollar-invoiced, the exchange rate is a much weaker instrument of external adjustment than the standard framework suggests.

4.3. What the Pricing Channel does not Predict

It is worth stating plainly what this literature does not claim, because the point is frequently lost. Dominant currency pricing predicts the absence of expenditure switching. It predicts that bilateral depreciation will fail to stimulate exports and that the dollar rate will matter more than the bilateral rate. It does not, on its own, predict that dollar appreciation should contract the exports of a country to a destination whose currency is the dollar. For that flow, dollar appreciation raises the exporter's local-currency receipts and, if anything, should support export supply.

Any observed contraction in United States-bound exports following dollar appreciation therefore requires a mechanism outside the pricing framework. This is the opening through which the financial channel enters, and it is the basis of the diagnostic proposed in Section 6.

V. THE FINANCIAL CHANNEL

5.1. The Dollar as a Measure of Global Credit Conditions

Bruno and Shin (2015) establish the mechanism. Internationally active banks fund themselves substantially in dollars while holding assets in a range of currencies, so dollar appreciation weakens the balance sheets of their borrowers, raises measured credit risk, and contracts the banks' own risk-taking capacity. The dollar therefore operates as an inverse index of

global liquidity, and its movements transmit to credit supply worldwide independently of any trade-competitiveness consideration.

The intervening links are individually documented. Emerging market corporates borrow in dollars in patterns consistent with carry-trade motives rather than purely operational hedging needs, which builds the mismatch that later transmits the shock (Bruno & Shin, 2017). That mismatch materialises in corporate distress following depreciation episodes (Bruno & Shin, 2020) and in real investment, where the dollar behaves as a global risk factor (Avdjiev et al., 2019a). The pricing of dollar funding scarcity is visible in deviations from covered interest parity that co-move with the dollar and with bank leverage (Avdjiev et al., 2019b). The transmission of United States monetary policy through global bank balance sheets is well established (Bräuning & Ivashina, 2020; Miranda-Agrippino & Rey, 2020), and the dollar's role as a risk factor for emerging market economies specifically has been documented at the aggregate level (Hofmann & Park, 2020). On the lending side, foreign currency loans carry distinct credit risk that materialises precisely when the exchange rate moves (Niepmann & Schmidt-Eisenlohr, 2022).

5.2. From Credit to Trade

The link to trade quantities runs through working capital. Trade is credit-intensive, and the intensity increases with the length of the production chain, because each additional stage adds a period during which inputs must be financed before revenue is realised. Dollar appreciation, by tightening dollar credit, therefore bites hardest where value chains are longest (Bruno et al., 2018). The theoretical apparatus for translating credit constraints into trade quantities is standard: financing frictions affect both which firms export and how much they export, operating on both the extensive and intensive margins (Manova, 2013; Melitz, 2003).

Bruno and Shin (2023) provide the direct test and the finding on which this article's diagnostic rests. Following dollar appreciation, exporters more reliant on dollar-funded bank credit suffer a greater decline in credit and a greater slowdown in exports. Critically, the slowdown includes exports to the United States. The aggregate counterpart is the documented co-movement of the dollar with bank leverage and real economic activity, a relationship the evidence suggests has strengthened as financial globalisation has deepened (Erik et al., 2020).

5.3. Why the Destination Detail is Decisive

The inclusion of United States-bound exports is not a robustness check. It is the identifying observation. For exports to the United States, the invoice currency and the destination currency coincide, so dollar appreciation raises the exporter's local-currency receipts per unit sold. The competitiveness channel predicts expansion. The pricing channel predicts, at worst, no effect. Only a supply-side mechanism operating through the exporter's own financing capacity predicts contraction. That contraction is observed.

This is a sign test rather than a magnitude test, which makes it robust to the measurement problems that afflict cross-sectional exposure measures. It does not require accurate estimates of invoicing shares or funding dollarisation. It requires only that the two flows be separated and their signs compared.

VI. RECONCILING THE TWO CHANNELS

6.1. Distinct Signatures

The two mechanisms share a driver and differ in almost everything else. Table 1 summarises the corpus on the dimensions that matter for separation.

Table 1. Principal evidence on dollar transmission to trade, by channel.

Study	Channel	Data and coverage	Identification	Headline finding
Gopinath et al. (2020)	Pricing	Bilateral price and volume indices, 2,500+ country pairs, 91% of world trade; Colombian firm-product data	Cross-sectional variation in dollar invoicing shares; terms-of-trade tests	1% broad dollar appreciation predicts ~0.6% decline in rest-of-world trade volumes within a year; effect rises with dollar invoicing share
Amiti et al. (2022)	Pricing (micro-foundation)	Belgian firm-level transaction data	Within-firm variation in invoicing choice	Invoicing is strategic; import intensity and competitor behaviour drive dollar choice, altering pass-through
Georgiadis and Schumann (2021)	Pricing (spillovers)	Cross-country macro panel	Structural model with dominant currency pricing	Output spillovers from dollar appreciation differ in sign and magnitude from producer currency pricing benchmark
Bruno and Shin (2015)	Financial	Cross-border banking aggregates	Structural model of bank leverage and dollar	Dollar strength contracts global bank risk-taking capacity
Bruno and Shin (2023)	Financial	Firm-level credit and export data	Cross-firm variation in dollar-funded credit reliance	Dollar appreciation reduces credit and exports for dollar-reliant exporters, including exports to the United States

Bruno et al. (2018)	Financial (mechanism)	Aggregate trade and chain-length measures	Working capital intensity of production chains	Credit tightening bites hardest where value chains are longest
Avdjiev et al. (2019a)	Financial (transmission)	Cross-country investment data	Dollar as global risk factor	Dollar appreciation associated with lower real investment
Avdjiev et al. (2019b)	Financial (pricing of funding)	Covered interest parity deviations	Dollar and bank leverage co-movement	Dollar strength widens CIP deviations, indicating dollar funding scarcity

Three separating signatures emerge from the table and from the underlying mechanisms.

- Destination composition. The pricing channel predicts no contraction, and possibly expansion, in United States-bound exports. The financial channel predicts contraction there alongside everywhere else. This is the sharpest test available and it does not depend on measuring exposure accurately.
- Time profile. Pricing effects operate at the frequency of price resetting and order books and should peak within roughly two to four quarters. Credit effects operate through loan rollover and working capital cycles and should build more slowly and persist longer. Horizon-by-horizon estimation, standard in this literature since Jordà (2005), therefore carries identifying information that single-horizon regressions discard.
- Cross-sectional incidence. The pricing channel scales in the dollar invoicing share of exports. The financial channel scales in the dollar share of exporter and bank funding. These are correlated, for the structural reason given in Section 3.2, but imperfectly so, and their correlation is far from unity across the EMDE universe.

6.2. The Composite Problem

The headline elasticity of roughly 0.6 percent (Gopinath et al., 2020) is a weighted average across a heterogeneous set of economies, and the weights are determined by an unmeasured mix of invoicing dollarisation and funding dollarisation. It is not a structural parameter. Using it to forecast, or to calibrate policy, requires assuming that the weights are stable across time and comparable across countries. Neither assumption has been tested, and Section 7 gives reason to doubt the first.

The symmetric criticism applies to the financial literature. Bruno and Shin (2023) identify the credit channel cleanly at the firm level, but the pricing channel is operating simultaneously in the background and is not netted out; the estimated credit elasticity is therefore conditional on a pricing environment that is itself changing.

Neither literature is at fault for this. Each answers the question it poses. The gap is that nobody has posed the joint question, and the consequence is that the field possesses two credible mechanisms and one number.

6.3. What a Joint Estimate Would Require

The decomposition is feasible with data that largely exist. It requires a panel with three elements: country-level export volumes disaggregated by destination so that United States-bound and rest-of-world flows can be compared; time-varying measures of dollar invoicing shares, which the Boz et al. (2022, 2025) series now provide for 115 countries; and measures of funding dollarisation at the banking-sector and corporate level from Bank for International Settlements banking statistics. Entering the two exposure measures jointly, with time effects absorbing the direct dollar shock, would identify each conditional on the other from cross-country variation alone.

The firm-level counterpart would use matched credit registry and customs data with product-destination-time effects, in the design established for credit supply shocks by Khwaja and Mian (2008) and applied to currency shocks by Bruno and Shin (2023). That specification isolates the credit channel definitionally, because the pricing channel operates identically across firms selling the same product to the same destination.

The binding constraint is not conceptual. It is the low observation frequency of invoicing data and the limited country coverage of matched firm-bank-customs registries.

VII. THE STABILITY QUESTION

Invoicing inertia has been among the most robust regularities in international macroeconomics, and it is documented directly in the 115-country panel (Boz et al., 2022). That inertia is now under pressure. Updated and expanded invoicing data show movements since 2020 that correlate with geopolitical alignment, including growth in renminbi invoicing concentrated in particular trading relationships (Boz et al., 2025). Excluding euro area countries, the dollar and euro accounted for roughly 60 percent and 25 percent of invoicing respectively by 2023. These shifts sit within a broader realignment of trade and financial linkages along bloc lines (Aiyar et al., 2023).

The implication for the pricing channel is direct and arithmetically unavoidable: its magnitude is explicitly a function of the dollar invoicing share, so a falling share means a weakening channel. The implication for the financial channel is neither direct nor obvious, and this asymmetry is, in the view taken here, the most consequential under-examined question in the field.

Three considerations suggest the financial channel will prove stickier. First, the complementarity established by Gopinath and Stein (2021) runs through safe asset markets, and the depth of dollar safe asset markets is not something a bilateral settlement arrangement can replicate. A firm may invoice in renminbi while continuing to fund in dollars, because the alternatives to dollar funding remain shallower and costlier. Second, the coordination externality that sustains dominance operates more strongly in financial markets, where liquidity begets liquidity, than in invoicing, where a bilateral pair can in principle agree to switch. Third, funding relationships are contractual and long-dated, whereas invoicing can change at the next order.

If this reading is right, the transition path has an uncomfortable property: partial de-dollarisation reduces measured trade exposure to the dollar while leaving balance-sheet exposure substantially intact, and possibly increases the mismatch between the currency of receivables and the currency of liabilities. A firm invoicing in renminbi and borrowing in dollars is more exposed to dollar appreciation than one doing both in dollars, not less. This is a testable proposition and it has not been tested.

VIII. WHAT THE EVIDENCE CANNOT CURRENTLY SETTLE

Five limitations bound the conclusions available from the present corpus.

- Frequency of invoicing measurement. Invoicing shares are observed at low frequency and must be interpolated for use in higher-frequency analysis. This attenuates estimated pricing interactions and biases any decomposition towards the financial channel, meaning that the balance of evidence in Section 6 should be read as an upper bound on the financial share.
- Identification of dollar shocks. Broad dollar movements are endogenous to global risk conditions, which independently move trade. The global financial cycle literature establishes how tightly these are linked (Miranda-Agrippino & Rey, 2020). No identification strategy in the corpus is uncontested, and several share a common failure mode if global risk drives both the dollar and the instruments used to purge it.
- Coverage of firm-level evidence. Matched credit registry and customs data exist for a small and non-random set of countries. The firm-level work validates the mechanism convincingly but cannot establish its external magnitude.
- Within-country heterogeneity. Country-level invoicing shares mask firm-level variation that the micro evidence shows to be substantial (Amiti et al., 2022). Aggregate moderators are therefore noisy proxies for the theoretically relevant exposure.
- Absence of a general-equilibrium accounting. Partial-equilibrium elasticities cannot be aggregated into a welfare statement without closing the loop through the United States and through third-country demand. The spillover work indicates that this closure changes the answer materially (Georgiadis & Schumann, 2021).

IX. POLICY IMPLICATIONS

The two channels imply different instruments, and conflating them produces policy that addresses the visible half of the problem.

9.1. Exchange Rate Policy

Where the pricing channel dominates, the competitiveness benefit of depreciation is largely illusory and monetary policy cannot purchase export growth through the exchange rate. Where the financial channel dominates, depreciation against the dollar is not merely ineffective but contractionary through balance sheets, which strengthens the case for leaning against disorderly moves. The relevant parameter is country-specific, and the same policy advice cannot be correct for a commodity exporter with shallow credit markets and a manufacturing exporter with deep ones.

9.2. Dollar Liquidity Provision

A financial channel of material magnitude implies that access to dollar liquidity during appreciation episodes performs a trade-protecting function distinct from its financial-stability function. Swap lines and precautionary facilities should therefore be evaluated against export outcomes and not only against funding spreads, given the documented co-movement of the dollar with bank leverage and real activity (Erik et al., 2020).

9.3. Macroprudential Regulation

Where funding dollarisation is high, limits on currency mismatch in banking systems and corporate balance sheets address the transmission mechanism directly rather than its symptoms. The evidence that dollar borrowing reflects carry-trade motives as well as operational need (Bruno & Shin, 2017) implies that a portion of this exposure is discretionary and therefore responsive to regulation, and the associated credit risk is measurable on the lending side (Niepmann & Schmidt-Eisenlohr, 2022).

9.4. Invoicing Diversification

Local currency settlement arrangements and regional payment systems target the pricing channel and nothing else. If the asymmetry argued in Section 7 holds, they will reduce measured trade exposure to the dollar while leaving funding exposure intact, and may in transition worsen the mismatch between the currency of receivables and the currency of liabilities. They should be presented and evaluated on that basis rather than as comprehensive de-risking. The coordination-externality foundation of dominance also means unilateral diversification confronts a collective action problem that bilateral arrangements only partially solve (Eichengreen et al., 2016; Rey, 2001).

9.5. Surveillance

Because invoicing composition now moves with geopolitical alignment rather than with trade fundamentals alone (Boz et al., 2025), currency composition has become a variable that trade surveillance and financial surveillance should track jointly rather than in separate workstreams.

X. CONCLUSION

The claim that a weaker currency helps exports is among the most durable propositions in applied economics and

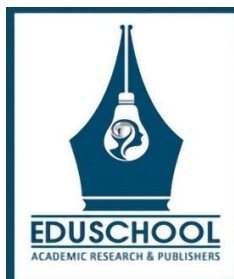
among the least reliable for the countries that most often act on it. Two literatures explain the failure, and this article has argued that they explain different parts of it. Dominant currency pricing removes the expenditure-switching benefit that theory promised. The dollar credit channel supplies a contractionary force that theory did not anticipate. The first predicts muted responses; only the second predicts the contraction in United States-bound exports that is actually observed.

The two are separable on evidence largely already collected, through destination composition, time profile, and cross-sectional incidence, and the destination test is decisive because it requires no accurate measurement of exposure. What has prevented separation is not data scarcity so much as the fact that the joint question has not been posed: each literature has answered its own question well and taken the other as background.

The cost of leaving them bundled is now rising. The headline elasticities on which policy analysis relies were estimated under three decades of invoicing stability that is ending. If invoicing diversifies while dollar funding does not, the composite elasticity will fall for reasons that leave the more damaging mechanism entirely in place, and the policy agenda currently gathering momentum around local currency settlement will be credited with a success it has not achieved. Distinguishing the two channels is therefore not a refinement. It is the difference between knowing and not knowing whether the world is becoming less exposed to the dollar or merely differently exposed to it.

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EDUSCHOOL JOURNAL OF TRADE AND FINANCE (EJTF)

(Open Access, Double-Blind Peer Reviewed Journal)

ISSN Online:



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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Article information

Received: 7th March 2026

Received in revised form: 1st April 2026

Accepted: 4th May 2026

Available online: 11th June 2026

Volume: 1

Issue: 1

DOI: <https://doi.org/10.5281/zenodo.21912039>

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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