Bridging the Credibility Gap: Sovereign Wealth Funds and International Trade *

Jinyuan Zhang† Ran Zhou‡

Abstract

Exporters from countries with weak institutions face higher barriers to entering foreign markets: destination-market buyers cannot easily verify product quality or enforce contracts. We show that sovereign wealth fund (SWF) equity stakes abroad help reduce these credibility frictions. Using a new dataset of 3,051 cross-border private-market deals by 51 SWFs (1995–2022), we find that an inaugural SWF investment increases home-country exports to the destination by approximately 10%, with no corresponding effect on imports. The export response is concentrated among origins with weaker institutional environments and in sectors where verification and contractual frictions are more severe. We establish causality by exploiting the 2018 US Foreign Investment Risk Review Modernization Act (FIRRMA), which exogenously diverted SWF capital to non-US destinations. The patterns are consistent with SWF stakes functioning as a credibility bridge—reducing quality-assessment costs through governance access and strengthening contractual commitment through sovereign assets at risk. We find no evidence of crowding out of other exporters.

Keywords: Sovereign wealth funds, bilateral trade, international finance, state capital

*We thank Francis Longstaff, Barney Hartman-Glaser, Tyler Muir, Ivo Welch, Stavros Panageas, Valentin Haddad, Geoff Zheng, Oleg Itskhoki and Yujie Liu. We are grateful for the support from the Fink Center for Finance and Investments.

†Jinyuan Zhang is at the Anderson School of Management, University of California Los Angeles. Email: jinyuan.zhang@anderson.ucla.edu

‡Ran Zhou is a Finance PhD student at the Anderson School of Management, University of California Los Angeles. Email: ran.zhou.phd@anderson.ucla.edu

1 Introduction

In the emerging era of geoeconomic competition, advanced economies deploy a broad toolkit to shape international commerce in their favor—export credit agencies, investment screening regimes, and targeted industrial policy.[1] Economies with weaker institutional environments, by contrast, largely lack these instruments. Their exporters face higher screening and verification costs, thinner trade networks, and limited brand capital—frictions that confine them to commodity markets and exclude them from the high-value supply chains that advanced economies dominate.[2] But many of these economies—particularly resource-rich states in the Middle East, Asia, and Africa—do control one instrument of genuine global scale: sovereign wealth funds (SWFs). Managing over $12 trillion in assets, with roughly two-thirds controlled by funds from non-advanced economies (Figure 1), SWFs have evolved from passive savings pools into active cross-border shareholders. Can SWF private-market investments help bridge this gap?

We study this question using a new dataset of 3,051 cross-border private-market deals by 51 SWFs from 33 origin economies (1995–2022), merged with bilateral industry-level trade data. Our central finding is that SWF private-market investments promote home-country exports—on the order of 10%—with no corresponding effect on imports. The export response is concentrated among origins with weaker institutional environments and in sectors where verification and contractual frictions are more severe, and we find no evidence of crowding out of other exporters.

What accounts for this export response? SWF private-market deals are distinctive in being large, long-horizon equity stakes that often carry commercial provisions—offtake commitments, supply arrangements, and co-investment agreements—that can directly reshape cross-border commerce. For example, Mubadala's investment in Boeing enabled its subsidiary Strata to become a certified supplier for the 787 and 777X programs, despite the UAE's lack of an aerospace track record. These deal-level linkages suggest a plausible channel through which sovereign capital could facilitate home-country exports, which we investigate systematically below.

Identifying the causal effect of SWF investment on trade is challenging because investment and trade flows are often jointly determined by unobserved fundamentals—sectoral productivity shocks, evolving comparative advantage, and growth opportunities. SWFs may also strategically target sectors with anticipated export growth, introducing selection bias. These concerns are amplified by the large, lumpy, and non-random nature of sovereign deals.

[1] See, for example, Matray et al. (2024) on US Export–Import Bank support, FIRRMA and the EU's investment screening framework for defensive measures, and Juhász, Lane and Rodrik (2024) on the new industrial policy.

[2] A large literature establishes this hierarchy, showing that high-income countries dominate differentiated exports (Hummels and Klenow, 2005; Schott, 2004), while countries with weaker institutions face higher effective trade costs (Waugh, 2010) and frictions that limit specialization in relationship-intensive sectors (Nunn, 2007; Levchenko, 2007).

Our primary identification exploits the 2018 Foreign Investment Risk Review Modernization Act (FIRRMA) as a quasi-exogenous shock to SWF presence. FIRRMA imposed broad regulatory burdens on all non-US state-linked investors, mandating filings for transactions involving a sovereign entity and a US "TID" (technology, infrastructure, or data) business and extending review timelines from 30 to up to 90 days. These changes sharply reduced SWF deal activity in the US: annual inbound investment fell from over $65 billion in 2016–2017 to under $15 billion by 2018. The resulting diversion of sovereign capital away from the US and toward alternative markets provides plausibly exogenous variation in SWF presence across non-US destinations. We leverage this variation in a difference-in-differences design that compares origin countries differentially exposed to the US regulatory shock.

To measure the intensity of the regulatory "bite," we construct an ex-ante exposure measure for each SWF origin country: the share of its global private-market transactions allocated to the US during 2014–2017. We then estimate the spillover effects on bilateral trade with third-country destinations (excluding the US), regressing outcomes on the interaction between this exposure measure and a post-2018 indicator. The model includes destination-year fixed effects, which absorb time-varying demand shocks and multilateral resistance terms, and origin-destination pair fixed effects, which account for time-invariant bilateral determinants. Our identifying variation therefore comes from within-destination, cross-origin comparisons: whether high-exposure origins disproportionately reallocate capital and exports to the same destination relative to low-exposure peers after the regulatory onset.

The FIRRMA results reveal a two-stage response. On the investment margin, SWF deal activity in the US fell sharply—from over $65 billion annually to under $15 billion (Figure 3)—and origins with higher pre-shock US exposure disproportionately redirected capital toward non-US destinations. On the trade margin, this financial reallocation generated real-economy spillovers—but only for non-advanced-economy origins. Their exports to third-country destinations rose progressively after 2018, with a 10 percentage point increase in exposure predicting a 4.1 percentage point rise in export growth. Advanced-economy origins also reallocated financial assets but experienced no detectable export response, consistent with the credibility gap being negligible where origin-country institutions are already strong.

We subject this design to several robustness checks. Balance tests confirm that pre-shock exposure is uncorrelated with general openness (exports and imports relative to GDP) and, most importantly, with direct trade reliance on the US. This orthogonality ensures that the regulatory bite of FIRRMA is distinct from any "tariff bite" arising from contemporaneous trade policy, making it unlikely that our estimates are confounded by other US-centric commercial shocks. Dynamic

event-study estimates support the parallel trends assumption and show no evidence of pre-trends. Finally, results are robust to excluding China from the sample, alleviating concerns that US–China trade tensions drive our findings.

We complement the FIRRMA experiment with staggered difference-in-differences estimates that exploit the timing of inaugural SWF entry across industries within country pairs. Using a matched stacked-DiD design with saturated fixed effects, we find that inaugural entry raises exports by approximately 10%, with no effect on imports—confirming that the same directional pattern generalizes beyond the FIRRMA episode. The export response is concentrated among non-advanced origins investing in advanced destinations and in contract-intensive sectors such as telecommunications and infrastructure, rather than in primary commodities. The economic magnitude is comparable to traditional state-backed trade interventions; for instance, Matray et al. (2024) document a 6% export decline following the withdrawal of US Export–Import Bank support.

The concentration of the export response in contract-intensive sectors already hints at a credibility-based channel. We probe this interpretation more formally by examining heterogeneity along the dimensions predicted by our framework. If sovereign equity operates through facilitation and commitment, the export-promoting effect should be larger when the baseline credibility gap is wider. Consistent with this logic, the effect scales with the severity of origin-country institutional deficits—measured by rule of law, strength of legal rights, and transparency of legal enforcement—indicating that both channels have more scope to operate where domestic institutions are weakest. On the product side, the effect is larger for differentiated goods, low-elasticity sectors, and contract-intensive industries, confirming that sovereign backing is most valuable where verification and enforcement frictions are most acute.

The credibility bridge should also function better when bilateral conditions support the exercise of governance rights and sustain credible commitments. We find that the effect is amplified by informational proximity—shorter geographic distance, common language, and FTA membership—consistent with both channels requiring monitoring capacity and institutional overlap to operate effectively. Crucially, the effect attenuates under elevated geopolitical risk. This boundary condition distinguishes the demand for credibility (weak origin institutions) from the supply of it: while institutional deficits generate demand for sovereign certification, extreme political instability undermines its supply by degrading both governance access and the credibility of the assets-at-risk mechanism.

We also examine several alternative explanations. The export response does not scale with revealed comparative advantage (ruling out a "picking winners" interpretation), with geopolitical alignment or government size (ruling out state-directed trade diversion), or with domestic financial

depth (ruling out a generic credit-supply channel).

Beyond establishing these mechanisms, we investigate whether SWF-induced export gains represent genuine trade creation or merely come at the expense of other suppliers. Our analysis finds no evidence of crowd-out: exports from non-SWF-investing origins to destination sectors that receive sovereign investments show no statistically or economically significant decline. This null effect, combined with our previous evidence ruling out destination-demand shocks, indicates that SWF-driven export expansion constitutes net trade creation rather than business stealing. The implications are consequently positive—sovereign investments appear to expand overall market access rather than simply redistributing existing trade opportunities.

Contribution and related literature. This paper contributes to four strands of work. First, we extend the literature on outward-oriented industrial policy. Traditional research has examined domestic instruments—subsidies, tariffs, and state-owned enterprises—and their interaction with competition and trade (Aghion et al., 2015; Juhász, Lane and Rodrik, 2024; Harrison and Rodríguez-Clare, 2010). More recent work has turned to instruments that operate beyond national borders, including export credit agencies (Matray et al., 2024) and state development banks (Musacchio et al., 2017), which facilitate foreign market access primarily through credit. We identify a distinct and potent instrument: SWF private-market equity. Unlike credit-based tools, sovereign equity operates through the governance and commercial provisions embedded in long-horizon stakes—offtake commitments, supply arrangements, and co-investment agreements—that directly reshape cross-border commerce. This instrument is disproportionately available to resource-rich economies with weak institutional environments, offering a new pathway for export upgrading where traditional policy levers are absent.

Second, we contribute to the literature on how institutional quality shapes trade and comparative advantage. Prior work establishes that informational asymmetries and weak contracting environments create frictions that disproportionately burden exporters from non-advanced economies: higher costs of contract enforcement and relationship-specific investment (Nunn, 2007; Levchenko, 2007), search frictions in differentiated goods markets (Rauch, 1999), and the fixed costs of meeting technical and sanitary standards in advanced markets (Maskus, Otsuki and Wilson, 2005; Disdier, Fontagné and Mimouni, 2008). While firms in advanced economies typically possess the brand capital and networks to navigate these barriers (Bernard et al., 2018; Antràs, Fort and Tintelnot, 2017), non-advanced-country exporters often lack the scale to overcome the fixed costs of compliance and distribution (Arkolakis, 2010). We advance this literature by identifying sovereign equity as a mechanism of institutional substitution: SWF stakes allow non-advanced-country exporters to bypass these structural deficits and access high-standard markets.

Third, we redirect the SWF literature from public-market investments and financial outcomes to private-market deals and real-economy effects. Most studies focus on publicly traded holdings and examine strategic versus financial objectives (Bortolotti, Fotak and Megginson, 2015), governance activism (Bertoni and Lugo, 2014; Dewenter, Han and Malatesta, 2010), geographic preferences (Chhaochharia et al., 2008; Knill, Lee and Mauck, 2012), and stock-price effects (Kotter and Lel, 2011). A notable exception is Bernstein, Lerner and Schoar (2013), who analyze both public and private SWF transactions and find that political involvement drives home bias.[3] We shift the focus to private-market deals and move beyond financial determinants to quantify their real economic impact on international trade.

Fourth, we contribute to work on cross-border capital flows and trade. Horizontal FDI typically substitutes for exports as firms establish overseas production to serve foreign markets (Helpman, Melitz and Yeaple, 2004; Antràs and Yeaple, 2014; Ramondo, Rodríguez-Clare and Tintelnot, 2015; Alfaro and Charlton, 2007), while vertical FDI complements trade through exchange of intermediate goods (Helpman, 1984); outward investment more broadly can also complement firm-level exports (Head and Ries, 2001). SWF investments represent a distinct form of state-linked cross-border ownership: unlike multinational firms, SWFs do not manage overseas operations but affect trade through their governance position in destination-country firms. We show that this form of capital flow promotes home-country exports—and crucially, the effect is concentrated among origins with weaker institutional environments, where the credibility gap is largest. Our work also connects to the emerging geoeconomics literature, which examines how geopolitical ties shape FDI flows (Clayton, Maggiori and Schreger, 2023; Aiyar, Malacrino and Presbitero, 2024) and how trade can improve political relationships (Kleinman, Liu and Redding, 2024). We provide causal evidence that economies with large sovereign savings can use financial investments to enhance market access—a form of geoeconomic strategy distinct from the diplomatic and regulatory tools available primarily to advanced economies.

2 Conceptual Framework: Bridging the Credibility Gap

As established above, exporters from institutionally weaker economies lack the policy instruments available to advanced economies for penetrating foreign markets. We now formalize the specific frictions they face and how sovereign equity can address them. We first describe the credibility gap, then embed it in a gravity structure that yields testable predictions. Appendix IA.I provides a

[3] Their sample includes 2,662 domestic and foreign transactions (1984–2007, 29 SWFs). Our sample covers 3,051 foreign private-market transactions (1995–2022, 51 SWFs).

formal micro-foundation based on incomplete contracts and relationship-specific investment.

2.1 The Credibility Gap and How SWF Stakes Bridge It

Exporters from countries with weak institutional environments face a *credibility gap* when seeking access to advanced markets: destination-market buyers cannot easily trust that the transaction will succeed. This gap has two dimensions.

The first is *quality credibility*. Destination-market buyers must incur costs to assess whether origin-country suppliers can meet quality standards, certifications, and compliance requirements. These costs are higher when origin-country institutions are opaque—making it difficult for exporters to demonstrate their capabilities (Rodrik, 1994)—and when products are differentiated, requiring bespoke quality assessment rather than reference to market prices (Rauch, 1999). We refer to the resulting trade friction as the *access* dimension of the credibility gap: buyers cannot verify the exporter's type.

The second is *commitment credibility*. Even after a relationship is established, incomplete contracts and weak enforcement in the origin country create hold-up risk (Anderson and Marcouiller, 2002). Exporters may shirk on quality, delivery, or contractual terms, and destination-market buyers have limited recourse when origin-country legal institutions cannot reliably enforce claims (Nunn, 2007; Levchenko, 2007). Buyers therefore demand a risk premium—or simply decline to transact. We refer to this as the *enforcement* dimension of the credibility gap: buyers cannot trust the exporter's behavior.

Together, these two dimensions raise trade costs for exporters from institutionally weaker origins. The gap is negligible for advanced-economy exporters, whose domestic institutions already provide quality certification and contractual enforcement.

When a sovereign wealth fund acquires an equity stake in a destination-market firm, it creates bilateral *relationship capital* that addresses both dimensions of the credibility gap through two reinforcing channels. First, *direct facilitation*: governance rights in the destination firm give the SWF access to certification processes, supply-chain positions, and contractual arrangements that home-country exporters could not access independently. For example, Mubadala's investment partnership with Boeing allowed its manufacturing subsidiary Strata to secure the stringent AS9100 certifications required to become a Tier-1 supplier for the 787 and 777X programs—a direct reduction in access frictions.[4] Second, *credible commitment*: the SWF's assets in the destination

[4] Similarly, ADQ's investment in Louis Dreyfus was paired with long-term offtake arrangements that reduced search and contracting frictions. The Qatar Investment Authority (via Hassad Food) acquired stakes in agricultural assets across Africa and Asia, securing supply agreements that support Qatar's role as a re-export hub.

country serve as implicit collateral (Williamson, 1983). If origin-country exporters fail to deliver on quality or contractual obligations, the destination country can impose costs on the SWF's broader portfolio—through regulatory action, reputational damage, or diminished access to future deals. The origin government therefore has a direct financial incentive to ensure its exporters perform, because sovereign assets are at stake. This creates a commitment device that substitutes for weak domestic enforcement institutions.[5]

Both channels operate on the exporter side. The SWF invests in destination-country firms, creating governance access and asset exposure in the destination market. This lowers the cost for origin-country firms to sell into that market (exports). For the reverse flow—imports into the SWF's origin country—neither channel is operative: the foreign exporter's quality is already certified by its own institutional environment, and the SWF's destination-country assets provide no collateral for transactions flowing in the opposite direction.

2.2 Testable Predictions

We embed the credibility gap in a standard gravity framework (Anderson and Van Wincoop, 2003). Bilateral trade costs decompose into physical frictions (distance, borders) and a *credibility wedge* that captures the access and enforcement costs described above. The wedge is larger when origin-country institutions are weaker and when products are more differentiated or contract-intensive.

SWF engagement reduces this wedge through the facilitation and commitment channels. The effectiveness of both channels is modulated by bilateral proximity: governance rights are harder to exercise at distance, and the hostage mechanism requires that the destination country can credibly impose costs on the SWF (Portes and Rey, 2005). Extreme geopolitical risk degrades both channels simultaneously, as it makes regulatory access unreliable (facilitation) and renders the collateral non-credible (commitment).

These arguments yield three testable predictions.[6]

Prediction 1 (Export effect). SWF engagement raises home-country exports by reducing the credibility wedge. As argued above, the effect is directional: exports increase but imports do not, because both channels operate through the SWF's presence in the destination market.

Prediction 2 (Heterogeneity in the credibility gap). The marginal effect of SWF engagement is larger when the baseline credibility gap is wider. This occurs along two dimensions:

[5] This mechanism is analogous to the "hostage" logic in Williamson (1983): a party with weak commitment credibility can restore trust by placing a valuable asset under the counterparty's control.

[6] Appendix IA.I formalizes these arguments and derives the predictions from a model of incomplete contracts and relationship-specific investment.

- Origin institutions: When the origin country has weaker rule of law, legal enforcement, or institutional transparency, the access and enforcement frictions are larger, and sovereign engagement has more scope to reduce them.
- Product characteristics: When goods are more differentiated (Rauch, 1999) or contract-intensive (Nunn, 2007), verification and hold-up costs are higher, making the credibility gap wider and the SWF's intervention more valuable.

This prediction rationalizes why effects concentrate among institutionally weaker origins: the credibility gap is largest where institutional deficits are most severe.

Prediction 3 (Heterogeneity in bridge effectiveness). The trade response is larger when the bilateral environment is more conducive to exercising governance rights and sustaining credible commitments. Specifically:

- Proximity: Both channels function better at shorter geographic distance and with shared language, which reduce monitoring and enforcement costs.
- Institutional integration: FTA membership provides shared legal interfaces that facilitate verification and dispute resolution.
- Geopolitical stability: Extreme geopolitical risk degrades both channels—it jams the facilitation channel (regulatory access becomes unreliable) and undermines the commitment channel (sovereign assets may be expropriated regardless of exporter behavior).

These three predictions structure the remainder of the paper. We test Prediction 1 in Section 5 and Predictions 2–3 in Section 6.

3 Data

We combine deal-level data on private sovereign wealth fund (SWF) investments with bilateral trade, trade-cost, foreign direct investment (FDI), and macroeconomic data to construct an annual panel at the SWF-origin-destination–industry-year level. The panel covers 51 SWFs from 33 origin countries, their investments in target firms in 101 destination countries, and associated bilateral exports and imports at the 2-digit SIC industry level over 1995–2022.

SWF investment data. We assemble a novel dataset of private SWF investments—covering infrastructure, real estate, and private equity transactions—by harmonizing five sources: two SWF-specific platforms (Global SWF and Sovereign Wealth Fund Institute) and three commercial transaction databases (S&P Capital IQ, PitchBook, and Mergermarket). The SWF-specific datasets

account for 92% of the transactions in our sample.[7] We cross-check transaction characteristics, primarily deal values, using the commercial databases.

For each transaction, we observe the SWF, target firm, target country, industry, investment date, and deal value. Because private firms lack a standardized industry classification and industry labels vary across data sources, we harmonize industry information by manually mapping the original industry descriptions to 2-digit Standard Industrial Classification (SIC) codes. We create a crosswalk mapping table for industry descriptions to SIC codes. We subsequently verify these assignments by manually reviewing the official websites of target firms to ensure that each SIC code reflects the firm's primary business activity. Appendix IA.II provides further details on the data construction process.

For the empirical analysis, we aggregate individual deals to the SWF-origin-destination–industry-year level. The final dataset contains 3,051 transactions by 51 SWFs from 33 countries between 1995 and 2022 (after merging with the bilateral trade and covariate data). These SWFs collectively manage about 90 percent of global SWF assets.

Bilateral trade data. We construct bilateral trade flows at the bilateral–industry-year level from the BACI dataset maintained by CEPII, which harmonizes UN COMTRADE data and reports values in free-on-board (FOB) terms. BACI covers 231 countries and 5,000 products at the HS six-digit level. We use the HS92 version (1995–2022) and map HS92 codes to SIC industries using the World Bank's concordance table.

Trade frictions, FDI, and institutional data. We measure bilateral trade frictions using standard gravity covariates from CEPII's GRAVITY dataset: great-circle distance, shared border, common language, same colonizer, political alignment, FTA membership, and UN political distance (Bailey, Strezhnev and Voeten, 2017). Bilateral FDI flows are from Steenbergen et al. (2023). Institutional quality is captured by the Rule of Law index (Kaufmann, Kraay and Mastruzzi, 2011), Transparent Laws with Predictable Enforcement from V-Dem (Coppedge et al., 2025), and Strength of Legal Rights from the Fraser Institute. Additional controls include the geopolitical risk index of Caldara and Iacoviello (2022), GDP, private-sector share of GDP, and government consumption share from the World Bank. Sectoral heterogeneity measures include product differentiation classifications from Rauch (1999) and Nunn (2007) and import-demand elasticities from Broda and Weinstein (2006). Appendix IA.III.1 reports summary statistics and data definitions.

[7] Global SWF and SWFI compile SWF investment information from annual reports, conference disclosures, press releases, and other public sources, and validate the data with the relevant SWFs.

4 Stylized Facts

Before turning to causal analysis, we document three features of SWF private-market activity that motivate our empirical design.

Fact 1: Deals are large, infrequent, and concentrated in contract-intensive sectors. SWF private-market deals are large and infrequent relative to standard institutional allocations. In our data, the mean transaction size is approximately $480 million (median $170 million), with each SWF completing about two private transactions per year on average (Table 1 Panel A). A substantial share of SWF private capital is directed toward real estate, technology, and infrastructure (Figure 2)—sectors closely tied to long-horizon competitiveness and characterized by high contract intensity. Compared with public-market holdings, private transactions give SWFs the contracting flexibility to negotiate bespoke terms—offtake commitments, supply arrangements, co-investment agreements, and local-content requirements—that can reshape commercial relationships beyond pure portfolio return.[8] These large, contract-intensive deals allow SWFs to underwrite the sizable fixed costs of regulatory compliance, certification, and distribution-network development that new trade relationships require.

Fact 2: SWF private investment is dominated by non-advanced-economy origins. As of 2024, SWFs manage over $12 trillion in assets, with around 75% invested abroad. Private markets have gained particular prominence, accounting for roughly 30% of these foreign allocations (Figure 1).[9] Crucially, SWFs from non-advanced economies—predominantly resource-rich states in the Middle East and Asia—are substantially more active in private markets than their advanced-economy counterparts. They invest across a broader set of target countries and commit nearly twice the capital amounts (Table 1 Panel A).

Fact 3: SWF flows do not follow trade. Gravity-style regressions at the country-pair-year level (Appendix Table IA.III.2) reveal that SWF investment patterns differ markedly from those of goods trade. SWF flows scale with economic size (Anderson and Van Wincoop, 2003; Portes and Rey, 2005) and co-move with institutional proximity (common language, FTAs, colonial ties), but are far less sensitive to distance than goods trade and flow toward politically more distant partners (Knill,

[8] For example, in 2017 Saudi Arabia's Public Investment Fund invested $3.5 billion in Uber, an investment linked to technology-sharing and operational-support agreements that facilitated the development of Saudi ride-hailing infrastructure and associated supply chains—directly enabling Saudi service exports in the broader transportation and logistics sector.

[9] Allocation shares are estimated from our sample and the 2016 SWFI survey. See https://www.SWFI.org/trends-sovereign-wealth-funds-asset-allocation-over-time-survey. On the recent expansion into private markets, see SWFI, Partnering for Success: Sovereign Wealth Fund Investments in Private Markets (2021): https://www.SWFI.org/publication/partnering-success-sovereign-wealth-fund-investments-private-markets.

Lee and Mauck, 2012). Most strikingly, lagged bilateral trade growth—a strong predictor of future trade—has no robust association, or even a negative association, with SWF allocations. Sovereign capital is not shadowing existing commercial relationships; it is deployed independently, guided by strategic and institutional considerations rather than by pre-existing trade patterns.

These three facts—large contract-intensive deals, dominance of non-advanced-economy origins, and independence from prior trade dynamics—set the stage for our causal analysis. We now exploit exogenous variation in SWF presence to estimate the trade effects of sovereign equity.

5 The Impact of SWF Investment on Bilateral Trade

Motivated by the investment patterns documented above, we now test whether sovereign capital shapes international trade. Our primary identification exploits the 2018 expansion of CFIUS under FIRRMA as a quasi-experimental shock that diverted SWF capital away from the US, generating plausibly exogenous cross-origin variation in SWF presence at third-country destinations. We then corroborate and generalize these findings using staggered difference-in-differences estimates that exploit the timing of inaugural SWF entries across industries within the same country pair over the full 1995–2022 sample. This second design confirms that the export-promoting effects are not an artifact of the FIRRMA episode and allows us to characterize the dynamic path, sectoral composition, and economic magnitude of the trade response.

5.1 The FIRRMA Natural Experiment

5.1.1 Background

Enacted on August 13, 2018, FIRRMA significantly expanded CFIUS jurisdiction to address national security concerns regarding foreign investments in critical technology, infrastructure, and sensitive data (TID).[10] The legislation broadened review authority over foreign investors by extending jurisdiction to certain non-controlling investments in TID businesses,[11] introducing mandatory filings for specific transactions, and lengthening review timelines.

While FIRRMA affected all foreign investors, it particularly burdened SWFs because they typically qualify as "foreign government" entities under the statute and because their investment

[10] See Congressional Research Service report (2019) and US Treasury summary.

[11] Definition of TID US business: https://www.ecfr.gov/current/title-31/subtitle-B/chapter-VIII/part-800/subpart-B/section-800.248.

preferences concentrate in technology and infrastructure sectors (Section 4).[12] CFIUS now mandates filing when a foreign government has a "substantial interest" in the investor acquiring a substantial interest in a TID US business.[13] These mandatory reviews, combined with extended timelines and heightened deal-blockage risk, created strong incentives for SWFs to redirect capital away from the US.

This redirection is evident in the data. Figure 3 shows inbound SWF private investment to the US plummeted from over $65 billion in 2016–2017 to $15 billion in 2018, while flows to other destinations remained stable. The absence of an immediate surge in non-US investment flows reflects the COVID-19 pandemic's impact on global dealmaking in 2020–2021 and gradual reallocation dispersed across many destinations (López, 2023).[14]

The FIRRMA-induced reallocation provides our identification strategy. Because FIRRMA targeted broad national security concerns rather than specific bilateral trade relationships, it raised transaction costs for SWFs independent of trade fundamentals. We exploit pre-FIRRMA portfolio concentration in the US as a source of cross-origin variation in the regulatory "bite," and examine whether differentially exposed origins subsequently increased both investment and exports to non-US destinations.

5.1.2 Identification Strategy

Exposure measurement. To capture the varying intensity of FIRRMA's impact, we construct a country-specific exposure measure based on pre-shock portfolio concentration in the US. Crucially, to gauge the full extent of regulatory impact, we compute this measure using the full set of SWF private investments rather than restricting the sample to the tradable sectors used in our trade analysis. For each origin country i, we measure exposure as the share of its SWF investments allocated to US during the pre-FIRRMA period (2014–2017):

$$\text{Exposure}_i \equiv \frac{\sum_{t\in\mathcal{P}} \text{Invest}_{it}^{\text{US}}}{\sum_{t\in\mathcal{P}} \text{Invest}_{it}^{\text{All}}}, \qquad \text{Post}_t = \mathbb{1}\{t \geq 2018\}. \tag{1}$$

Origins with no SWF investments in US in 2014–2017 are assigned $\text{Exposure}_i = 0$. For robustness, we also employ a binary measure, Exposure_i^H, defined as an indicator variable that equals one if

[12] US Treasury, FIRRMA/CFIUS summaries and FAQs. Practitioner overviews emphasize that sovereign wealth funds typically meet the "foreign government" test and therefore face mandatory declarations absent a specific managed-fund carve-out.

[13] See definition of substantial interest: https://www.ecfr.gov/current/title-31/subtitle-B/chapter-VIII/part-800/subpart-B.

[14] According to annual CFIUS reports, the number of covered declarations—short-form filings introduced under FIRRMA—was only 20 in the initial implementation year (2018), reflecting the chilling effect of the new regulatory regime on foreign investment in sensitive sectors.

origin i's pre-shock exposure exceeds the sample mean, and zero otherwise.

The cross-country variation in exposure to US regulatory risk is illustrated in Figure 4. Contrary to the perception that investment restrictions primarily target geopolitical rivals such as China, the sovereign investors with the highest pre-FIRRMA exposure are actually advanced economies with concentrated portfolios. Australia (AUS) exhibits the highest exposure, with nearly 95% of its pre-FIRRMA SWF investments concentrated in the US, followed by Hong Kong (HKG) and New Zealand (NZL) with ratios exceeding 50%. Sovereign investors from resource-rich Middle Eastern economies—including Saudi Arabia (SAU), Oman (OMN), and the United Arab Emirates (ARE)—cluster in the intermediate range of 25–40%. In contrast, China (CHN) records a relatively low exposure ratio (approximately 10%).

Estimation specifications. We then test two core predictions of our framework. First, on the investment margin, more-exposed origins should reallocate SWF capital away from the US toward alternative destinations after FIRRMA. Second, on the trade margin, if sovereign capital facilitates market access, this investment reallocation should subsequently strengthen bilateral exports from origin i to target j.

Our analysis uses a balanced origin-destination–year panel (i, j, t) for 2014–2022, excluding the US as a destination. We first estimate a PPML gravity specification that compares SWF flows from high-exposure versus low-exposure origins to the same target countries and years:

$$\mathbb{E}\big[\mathrm{SWF}_{ijt} \mid \cdot\big] = \exp\Big(\beta\, \mathrm{Exposure}_i \times \mathrm{Post}_t + \mu_{ij} + \nu_{jt} + \lambda' Z_{ijt}\Big), \tag{2}$$

where SWF_{ijt} denotes the value of SWF investment from origin i to non-US target j; μ_{ij} are country-pair fixed effects that absorb time-invariant bilateral characteristics (distance, language, colonial ties) and baseline investment relationships; ν_{jt} are target-year fixed effects that absorb shocks common to all origins in destination j; and $\lambda' Z_{ijt}$ collects controls for origin-side macro and bilateral conditions—a bilateral FTA indicator, $\log \mathrm{GDP}_{it}$, the United Nations political distance measure, $\mathrm{asinh}(\mathrm{Trade}_{it})$, and origin-country trade growth. Standard errors are clustered at the country pair level.

For trade outcomes, we compare exports across origin countries with different exposure to the FIRRMA shock. To account for these level effects while accommodating zero trade flows, we follow Matray et al. (2024) and estimate linear specifications using symmetric (arc-percent) growth rates as the dependent variable:

$$\Delta Y_{ijt} \equiv \frac{Y_{ijt} - \overline{Y}_{ij,\mathrm{pre}}}{0.5\,(Y_{ijt} + \overline{Y}_{ij,\mathrm{pre}})} = \theta\, \mathrm{Exposure}_i \times \mathrm{Post}_t + \mu_{ij} + \nu_{jt} + \lambda' Z_{ijt} + \varepsilon_{ijt}, \tag{3}$$

where Y_{ijt} denotes exports from country i to j in year t and $\overline{Y}_{ij,\text{pre}}$ is the pair-specific 2014–2017 average. All other details match the investment specification.

Identification assumption. The key identification assumption is that, absent the FIRRMA regulatory shock, more- and less-exposed origin countries would have followed parallel trends in their exports to non-US destinations. A primary threat to this assumption is that our exposure measure may proxy for broader dependence on the US economy rather than for SWF-specific reallocations. For instance, if more exposed countries are also more reliant on US-bound trade, they may be differentially affected by contemporaneous US trade-policy shocks (e.g., tariffs) around the same period, confounding our estimates. A related concern is that exposure may capture a country's overall US-oriented outward investment or FDI linkages; in that case, the estimated export response could reflect general foreign-investment effects rather than the reallocation of SWF capital. We probe the validity of both assumptions by testing whether our exposure measure is correlated with observable pre-shock characteristics.

Figure 4 Panel (b) reports coefficients from bivariate regressions of FIRRMA exposure against a set of pre-2018 country characteristics (averaged over 2014–2017). All covariates are standardized to facilitate comparison. Two key patterns support our identification strategy.

First, our exposure measure is orthogonal to structural trade and investment linkages. As shown in the figure, the measure is statistically unrelated to general global openness (measured by the levels and growth rates of total trade and FDI relative to GDP). Crucially, it is also orthogonal to specific bilateral reliance on the United States: the coefficients for US export exposure, import exposure, and bilateral FDI intensity are all statistically indistinguishable from zero.[15] This null result is economically significant. It confirms that the regulatory shock isolates a specific governance friction rather than merely proxying for deep commercial ties. Consequently, our estimates are unlikely to be confounded by the concurrent US–China trade war, as the "regulatory bite" of FIRRMA is uncorrelated with the "tariff bite" of trade policy.

Second, the only characteristic significantly correlated with exposure is economic size, measured by log GDP. This indicates that larger economies (e.g., Australia and Norway) tend to have more concentrated portfolios.

Taken together, these balance tests indicate that our exposure measure captures idiosyncratic variation in strategic portfolio concentration rather than systematic trade dependencies or FDI linkages. This supports interpreting FIRRMA as a plausibly exogenous financial supply shock,

[15] We define *Export Exposure* as the share of a country's total exports destined for the United States during the pre-period $\mathcal{P}$, calculated as $\frac{\sum_{t\in\mathcal{P}} \text{Exports}_{it}^{\text{US}}}{\sum_{t\in\mathcal{P}} \text{Exports}_{it}^{\text{All}}}$. *Import Exposure*, *FDI Outflow Exposure*, and *FDI Inflow Exposure* are defined analogously using the respective bilateral flows relative to the country's global totals.

distinct from the broader trade decoupling dynamics of the era. In the next section, we substantiate this causal interpretation with three additional robustness checks: (i) dynamic event-study estimates confirming the absence of pre-trends; (ii) specifications controlling for pre-FIRRMA trade specialization with the US; and (iii) results demonstrating robustness to the exclusion of China.

5.1.3 Results

Table 2 presents the results while Figure 5 validates the identification strategy through dynamic event studies. The absence of pre-trends in both the investment and export panels supports the interpretation that the observed diversion was triggered by the regulatory shock.

Investment reallocation. Columns (1)–(2) confirm that FIRRMA successfully diverted SWF capital. The economic magnitude is substantial: a 10-percentage-point higher exposure is associated with an approximate 112% ($= \exp(0.1 \times 7.51) - 1$) increase in capital flows to alternative markets (col. 1). This finding is corroborated by the binary specification, which indicates that highly exposed origin countries nearly tripled their non-US investments relative to their less exposed counterparts (col. 2).

Export response: non-advanced origins only. The critical question is whether this financial reallocation generated real trade spillovers. Columns (3)–(6) show that it did—but only for non-advanced-economy origins. The baseline export coefficient is positive and significant (0.413, col. 3), while the triple interaction Exposure $\times$ Post $\times$ Adv. Origin is negative (-0.487), effectively nullifying the response for advanced economies. A 10 percentage point increase in exposure predicts a 4.1 percentage point rise in export growth for non-advanced origins.

Figure 5 corroborates this result visually. Panel (a) confirms the sharp, persistent diversion of capital from the US post-2018. Panel (b) shows the dynamic export trajectory for non-advanced-economy SWFs (solid blue line) rises significantly after the shock, while advanced-economy SWFs (red dashed line) remain flat and statistically indistinguishable from zero throughout the post-shock period.

We conduct an analogous analysis using bilateral imports as the dependent variable. Appendix Figure IA.III.1 reports the dynamic coefficients. Unlike the clean export response, the import results show no systematic pattern: coefficients are imprecisely estimated, and for non-advanced-economy origins, pre-treatment estimates in 2015–2016 are elevated, suggesting that parallel trends may not hold for this outcome. This null import finding reinforces the directional interpretation: FIRRMA-induced SWF reallocation promotes exports from the origin country but does not measurably affect imports.

Addressing confounders. A key identification concern is that 2018 coincides with the escalation of US–China trade tensions. This raises the possibility that our results capture tariff-induced trade diversion rather than the effect of investment restrictions. To isolate the FIRRMA channel from these contemporaneous shocks, we conduct four robustness tests.

First, in Columns (5) and (6) of Table 2, we explicitly control for the "tariff channel" by interacting the post-2018 dummy with pre-FIRRMA bilateral exposure to the US (exports, imports, and FDI). If our results were driven by countries simply substituting away from the US market due to tariffs, we would expect these controls to absorb the effect. Instead, the coefficient on Exposure $\times$ Post remains remarkably stable in both magnitude (0.431 in Col 5 vs. 0.413 in Col 3) and statistical significance. This stability confirms that the observed export surge is driven by the reallocation of sovereign capital, not by mechanical trade substitution away from the US.

Second, we address the specific role of China by re-estimating equations (2) and (3) on a subsample that excludes all observations where China appears as either the origin or the destination. Appendix Table IA.III.5 reports these results. Both the investment reallocation effect and the subsequent export response remain positive and statistically significant, with magnitudes comparable to our baseline estimates. These patterns indicate that our findings are not an artifact of China-specific decoupling, but rather reflect broader FIRRMA-induced shifts in global sovereign capital flows.

Third, as a placebo, Appendix Table IA.III.6 replaces SWF exposure with an analogous measure of non-SWF FDI exposure. The FDI exposure measure shows no corresponding increase in bilateral exports, confirming that the trade response is specific to sovereign investment through SWFs.

Fourth, because our industry classification relies partly on imputed SIC codes for infrastructure deals, Appendix Table IA.III.7 re-estimates the FIRRMA specification after dropping all imputed deals; the results remain qualitatively unchanged (see Appendix IA.III.6).

5.2 Corroborative Evidence: Inaugural Entry Event Studies

We now turn to the broader cross-section of inaugural SWF entries over 1995–2022, exploiting staggered timing across industries within country pairs to corroborate the FIRRMA findings and characterize the trade response in greater detail.

5.2.1 Design

Panel PPML regression. Our empirical strategy exploits the staggered timing of inaugural SWF investments across industries and years. From 1,078 transactions in tradable sectors, our sample identifies 542 unique entry events defined at the country-pair-industry (2-digit SIC) level. Using a

balanced panel from 1995 to 2022, we compare post-entry trade flows in treated industries against non-treated industries within the same country pair by estimating the following PPML model:

$$\mathbb{E}\left[Y_{ijkt} \mid \cdot\right] = \exp\left\{\beta\, \text{TreatPost}_{ijkt} + \mu_{ijk} + \nu_{ijt} + \delta_{kt} + \lambda' \operatorname{asinh}(Z_{ijkt})\right\}, \tag{4}$$

where Y_{ijkt} denotes exports (or imports) from i to j in 4-digit SIC industry k and year t, and TreatPost_{ijkt} equals one in all years after the first SWF investment in the corresponding 2-digit sector that contains industry k for country pair (i, j). We define treatment at the 2-digit level to capture supply-chain spillovers, as firms within these broader sectors are typically vertically linked.

The specification includes pair-industry fixed effects (μ_{ijk}) to absorb time-invariant bilateral and sectoral characteristics, pair-year fixed effects (ν_{ijt}) to control for time-varying bilateral shocks, and in the most saturated version, industry-year fixed effects (δ_{kt}) to absorb worldwide sectoral trends. Because fully saturating the model with origin-industry-year and destination-industry-year fixed effects is computationally infeasible, we proxy for time-varying multilateral resistance (Anderson and Van Wincoop, 2003; Baier and Bergstrand, 2007) using leave-one-out (LOO) trade flows.[16] For exports, Z_{ijkt} includes the origin's LOO total exports to the rest of the world (supply proxy) and the destination's LOO total imports (demand proxy), defined analogously for imports.[17] Standard errors are clustered at the country-pair level.

Stacked difference-in-differences. Standard two-way fixed effects estimators can yield biased estimates under staggered treatment timing with heterogeneous effects (Baker, Larcker and Wang, 2022; Goodman-Bacon, 2021; Sun and Abraham, 2021; Callaway and Sant'Anna, 2021). We therefore adopt a stacked event-study design. Each of the 542 inaugural entry events defines a cohort centered on the investment year t_c, with data from $t_c - 5$ to $t_c + 5$; requiring at least three pre-treatment years restricts the sample to 491 events. Within each cohort, we match each treated industry to the five never-treated 4-digit SIC industries with the most similar pre-event export and import growth trends, ensuring that the control group shares parallel trade trajectories in the pre-investment period.

We then stack these cohort-specific datasets to estimate the dynamic treatment effect. The stacked regression specification is:

$$\mathbb{E}\left[Y^c_{ijkt} \mid \cdot\right] = \exp\left\{\sum_{\tau=-5}^{5} \beta_\tau \mathbb{1}\left\{t - t_c = \tau\right\} \cdot \text{Treat}^c_k + \lambda' \operatorname{asinh}(Z_{ijkt}) + \mu^c_k + \nu^c_t\right\}, \tag{5}$$

[16] The inverse hyperbolic sine is $\operatorname{asinh}(x) = \ln(x + \sqrt{x^2 + 1})$; it is approximately linear near zero and log-like for large x, allowing us to retain zero-trade observations.

[17] For imports, we use the partner's LOO total exports (supply) and the reporting country's LOO total imports (demand). For total trade, we use LOO trade turnover for both countries.

where Treat_k^c indicates treatment-group membership in cohort c, and β_τ captures the dynamic treatment effect at event time τ. The specification includes cohort-specific pair-industry fixed effects (μ_{ijk}^c) and cohort-by-year fixed effects (ν_t^c). We replace industry-by-year fixed effects with leave-one-out trade flow controls, $\text{asinh}(Z_{ijkt})$, because industry-year effects estimated on a matched subsample would capture the endogenous mean of treated and control units rather than exogenous global trends.[18] Standard errors are clustered at the cohort level.

5.2.2 Results

SWF entry raises exports, not imports. Table 3 reports the impact of inaugural SWF investments on bilateral exports and imports, confirming the directional asymmetry documented in the FIRRMA analysis.

Panel A presents the panel PPML estimates. The export coefficients are positive but larger and more specification-sensitive than our preferred stacked-DiD estimates: inaugural SWF entry is associated with a 24.4% increase in the less saturated specification (col. 3) and a 14.2% increase in the fully saturated specification (col. 4).[19] By contrast, the corresponding estimates for imports are small and statistically insignificant (cols. 1–2).

Panel B reports the stacked DiD estimates. Pre-treatment coefficients ($\tau < -1$) in Figure 6 Panel A are near zero and statistically insignificant, supporting the parallel trends assumption within matched cohorts. The export effect is precisely estimated and stable across specifications: SWF entry increases exports by approximately 9.8% (col. 4), materializing in the year of investment and persisting through year five (Figure 6). Import estimates are small and statistically insignificant in the preferred specification with controls (col. 2). The directional asymmetry—exports rise but imports do not—is consistent with Prediction 1: sovereign certification operates on the exporter side, lowering verification costs for destination-market buyers without relaxing analogous frictions for inbound trade.

Economic magnitude. Using the sample mean of pre-treatment exports for treated country pairs ($910 million) and the average initial SWF equity investment ($600 million), the estimated 9.8% export increase implies a trade multiplier of approximately 0.15—each dollar of SWF investment generates roughly 15 cents in additional annual exports.[20] This magnitude is comparable to

[18] Since our sample is constructed via matching, it is by definition a selected subset and not representative of the global market. Consequently, an industry-year fixed effect estimated solely on this sample would not capture the true exogenous global sectoral trend, but rather the endogenous mean of the treated and matched pairs.

[19] Throughout, PPML coefficients $\hat{\beta}$ are interpreted as proportional changes of $\exp(\hat{\beta}) - 1$ in the outcome. A coefficient of 0.218 implies $\exp(0.218) - 1 \approx 0.244$.

[20] Calculation: $(0.098 \times 910\text{m})/600\text{m} \approx 0.15$.

traditional state-backed trade interventions: Matray et al. (2024) document a 6% export decline following the withdrawal of US Export–Import Bank support.

Institutional heterogeneity. The event-study design allows us to further decompose heterogeneity more finely across all origin-destination pairings. Table 4 examines heterogeneity by the development status of both the origin and destination countries.[21]

The most robust export gains arise when a non-advanced-economy SWF invests in an advanced destination—precisely the pairing where the credibility gap is widest. Inaugural entry raises exports by about 8.2% in this subsample (col. 6), with a larger point estimate without controls (col. 5). Non-advanced-origin investments into non-advanced targets yield smaller, statistically insignificant estimates (cols. 7–8). The advanced-origin subsample exhibits weaker and less stable effects: the advanced-to-advanced estimate is essentially zero in the baseline (col. 1) and marginally positive with controls (col. 2), while advanced-to-non-advanced estimates are imprecise (cols. 3–4). Panel B of Figure 6 corroborates this pattern: only the non-advanced origin → advanced target event study shows a clear, sustained post-treatment increase with no pre-trends.

Sectoral heterogeneity. Beyond country-pair heterogeneity, the industry-level design allows us to ask whether SWF-related export growth extends to sophisticated, contract-intensive sectors or is confined to standardized goods. Table 5 shows that for non-advanced-country SWFs to advanced destination (Panel A), the export effect is concentrated in Telecommunications (15.0%, col. 2) and Infrastructure (6.2%, col. 3). Manufacturing is positive but insignificant (col. 1); Agriculture is large and negative (col. 5). For advanced-country SWFs (Panel B), a significant effect emerges only in Manufacturing (8.2%, col. 1).

The pattern is informative: SWFs do not simply boost the existing export profile of their home countries. Instead, non-advanced-country SWFs facilitate exports in modern, networked sectors—telecommunications and infrastructure—to advanced economies. These are sectors where credibility frictions are likely to be severe: both are contract-intensive, involve relationship-specific investments, and require extensive regulatory certification (Nunn, 2007)—characteristics that make entry costly for exporters lacking institutional backing. By contrast, the null effect in agriculture, a sector dominated by homogeneous commodities traded on organized exchanges (Rauch, 1999), is consistent with sovereign certification adding little value where products are already standardized and verifiable. This sectoral pattern foreshadows the credibility-gap mechanism we test in Section 6.

Robustness. A primary concern in the analysis of sovereign capital is that the results may be driven by a few dominant strategic players—most notably China—rather than representing a general

[21] We use the standard World Bank classification of advanced vs. non-advanced economies, which correlates strongly with institutional quality measures used in our mechanism tests ($\rho = 0.74$–0.86).

economic phenomenon. Given China's outsized role in global trade, it is plausible that our findings simply capture the specific features of Chinese state capitalism rather than the broader effect of sovereign investment.

To address this, Figure 7 presents a leave-one-out sensitivity analysis, re-estimating the core specifications while sequentially excluding each SWF origin country. The results robustly reject the notion that any single country drives our findings. In both the panel regression (Panel A) and the stacked DiD specification (Panel B), the estimated coefficient remains stable, positive, and statistically significant when China is dropped from the sample. This pattern holds for the exclusion of other major investors as well. The stability of the estimates across these exercises confirms that the documented export-promoting effect of SWF investments is not an artifact of one country's unique institutional or strategic footprint. As an additional check, Appendix Table IA.III.8 re-estimates both the panel PPML and stacked DiD specifications after excluding deals with imputed infrastructure SIC codes; the export effect remains robust (see Appendix IA.III.6).

Limitations. Despite the saturated fixed effects and matched staggered DiD design, we cannot rule out shocks at the country-pair-industry-year level that jointly trigger SWF entry and move trade. For instance, a technological breakthrough in a destination country's telecommunication sector might both expand its imports (the home country's exports) and make its firms more attractive to foreign investors, upward-biasing the estimated treatment effect. The consistency with the FIRRMA results—which exploit orthogonal, regulatory-driven variation—strengthens the causal interpretation of both designs: the FIRRMA experiment rules out reverse causality from trade to investment, while the event-study analysis demonstrates that the patterns generalize beyond a single regulatory episode.

6 Bridging the Credibility Gap: Mechanism Tests

The preceding analysis documents that SWF investments are associated with higher home-country exports (Prediction 1), with effects concentrated among institutionally weaker origins and in contract-intensive sectors. This section tests Predictions 2 and 3 and examines alternative channels.

6.1 Heterogeneity in Baseline Frictions

If sovereign equity operates through the credibility-gap channel, the marginal impact of investment on exports should scale with the severity of the underlying informational or institutional friction. We test this hypothesis by extending our baseline stacked difference-in-differences framework to

include a triple interaction term. Formally, we estimate:

$$\mathbb{E}\left[Y^c_{ijkt} \mid \cdot\right] = \exp\left\{\beta_0 \text{Treat}^c_k \times \text{Post}^c_t + \beta_1(\text{Treat}^c_k \times \text{Post}^c_t \times \bar{F}_{ijk}) + \mu^c_k + \nu^c_t + \lambda' \operatorname{asinh}(Z_{ijkt})\right\}, \tag{6}$$

where $\bar{F}_{ijk}$ denotes a proxy for the baseline credibility gap. We distinguish between two types of frictions: origin credibility deficits (where $\bar{F}_{ijk} = \bar{F}_i$ captures institutional weakness) and product opacity (where $\bar{F}_{ijk} = \bar{F}_k$ captures verification difficulty). To facilitate interpretation, all friction variables are defined such that higher values correspond to greater institutional weakness or informational asymmetry. Consequently, a positive coefficient $\beta_1 > 0$ indicates that the SWF trade-promoting effect is stronger when the baseline credibility wedge $\bar{F}_{ijk}$ is wider.

We estimate Equation (6) on SWF entries from non-advanced origins into advanced destinations to sharpen mechanism interpretation and improve power. First, because development status is highly collinear with institutional quality,[22] pooling advanced-economy origins would make institutional interactions partly proxy for broad differences in development rather than institutional credibility per se. Second, since baseline effects are concentrated among non-advanced origins and the credibility gap is widest for exporters with large institutional deficits vis-à-vis high-standard markets, including advanced-to-advanced pairs would dilute the pooled effect and reduce power.

Panel A of Table 6 tests whether the trade-creating effect scales with origin credibility deficits and product opacity.

Origin institutions. Across all three origin-institution proxies, the interaction with treatment is positive and statistically significant (cols. 1–3).[23] The proxies capture complementary dimensions of institutional weakness: Rule of Law (col. 1) measures judicial quality and contract enforcement broadly; Strength of Legal Rights (col. 2) captures creditors' statutory ability to enforce claims; and V-Dem's Transparent Laws with Predictable Enforcement (col. 3) isolates whether legal outcomes are foreseeable to foreign buyers. Consistent with Prediction 2, the marginal value of sovereign backing is largest where domestic legal enforcement is most opaque or weak.

Product opacity. Columns (4)–(6) examine heterogeneity by product opacity—the extent to which buyers must incur verification and enforcement costs to transact.[24] In column (4), we use the Rauch (1999) classification of differentiated goods. Relative to commodities traded on organized exchanges, differentiated products lack reference prices and require costlier screening. The triple

[22] In our sample, the correlation between the advanced-economy indicator and the Rule of Law index is 0.78, with similarly high correlations for the Legal Rights index ($\rho = 0.74$) and Transparent Laws ($\rho = 0.86$).

[23] The result is robust to broader measures of institutional quality, including Control of Corruption and the Fraser Institute's Economic Freedom index.

[24] Because these proxies vary at the industry level, we merge each measure to our stacked matched sample at the 4-digit SIC level.

interaction is positive and significant, indicating that SWF engagement disproportionately increases exports in differentiated sectors.

The Rauch classification is coarse and categorical. In column (5), we therefore use a continuous measure based on the Broda and Weinstein (2006) trade elasticity σ. We construct *reverse elasticity* (standardized $-\sigma$) so that higher values correspond to greater differentiation. The interaction remains positive and significant: SWF engagement has larger effects in low-elasticity sectors, where ex ante verification is more difficult. Importantly, standard gravity models predict that higher demand elasticity (σ_k) should magnify the quantity response to any given reduction in trade costs. The fact that we find stronger effects precisely in high reverse-elasticity (low σ_k) sectors indicates that credibility frictions, rather than price sensitivity, drive the trade response.

Column (6) uses Nunn (2007)'s measure of contract intensity, capturing reliance on relationship-specific investments under incomplete contracts (see also Macchiavello and Morjaria, 2015). The positive interaction confirms that sovereign backing is most valuable in contract-intensive sectors.

6.2 Heterogeneity in Bridge Effectiveness

Panel B of Table 6 tests Prediction 3: whether SWFs are more effective at bridging the credibility gap when the bilateral environment is more conducive to exercising governance rights and sustaining credible commitments.

The key distinction is between physical trade costs and informational proximity (Steinwender, 2018): if distance mattered only through shipping costs, it would not interact with the marginal effect of sovereign engagement on the credibility gap. Finding that distance modulates the treatment effect therefore identifies an informational channel, rather than a pure transport-cost mechanism. Columns (1)–(3) proxy for informational proximity using standard bilateral measures. The treatment effect attenuates with log distance (col. 1) and is amplified by common language (col. 2). Column (3) provides complementary evidence: the effect is larger within FTA pairs, consistent with deeper bilateral integration lowering the cost of verifying and enforcing the sovereign signal through repeated interactions and shared institutional interfaces (Portes and Rey, 2005).

Column (4) examines a boundary condition for certification by interacting treatment with the origin's Geopolitical Risk Index. The negative and significant coefficient indicates that the trade-promoting effect of sovereign backing diminishes when geopolitical risk is elevated. This finding is crucial for conceptually distinguishing between the demand for credibility (weak institutions, Panel A) and the supply of it. While weak legal institutions generate a demand for certification, extreme political instability undermines the supply of credible enforcement. Effectively, high geopolitical risk "jams" the signal: threats of sanctions, conflict, or regime instability degrade the certification

value of the sovereign's "skin in the game," preventing SWFs from bridging the credibility gap.

6.3 Alternative Channels

Panel C of Table 6 assesses several prominent competing explanations for the estimated trade effects.

First, we address a "picking winners" interpretation in which SWFs target sectors with stronger pre-existing fundamentals. In column (1), we interact treatment with the industry's baseline revealed comparative advantage (RCA). The interaction is small and statistically indistinguishable from zero, suggesting that the export response is not disproportionately concentrated in sectors with higher baseline comparative advantage. This pattern is consistent with the view that SWF stakes alleviate transaction-level credibility frictions—such as verification and enforcement concerns—rather than simply reallocating capital toward already-strong industries.

Second, we assess whether the estimated effects are better explained by geopolitical alignment or state-directed trade diversion. We proxy alignment using UN voting distance and the domestic footprint of the state using government consumption as the share of GDP. In both cases, the interaction terms are economically small and statistically insignificant (cols. 2–3), offering little support for a geopolitical-favoritism or state-planning explanation.

Third, we assess whether SWF engagement operates primarily by relaxing domestic financial constraints. Following Matray et al. (2024), we interact treatment with origin's private credit to GDP, a standard proxy for domestic financial depth. The interaction is economically small and statistically insignificant (col. 4), suggesting that the estimated export effects are unlikely to be driven by broad improvements in domestic liquidity or credit supply.

Finally, column (5) examines the extensive margin of trade adjustment by testing whether SWF engagement is associated with entry into new product lines. We use the count of distinct HS6 varieties exported within an i–j–k cell as the dependent variable. The estimated effect is small and statistically insignificant, indicating that SWF engagement does not systematically drive diversification into new product categories. This result suggests that SWFs bridge the credibility gap primarily through the intensive margin—raising volumes by reducing per-transaction verification frictions—rather than through entry into new markets. We interpret this null result with caution, however, as our measure captures cross-product diversification at the industry level and may be too coarse to detect firm-level entry within existing product lines.

7 Implications

7.1 Trade Creation, Not Diversion

If sovereign equity merely helps SWF-linked exporters displace incumbents, the welfare implications are limited. We test for such diversion by examining whether other origins' exports to the same destination-sector cells decline when SWF-backed exports expand. We aggregate bilateral trade to the origin o–destination j–2-digit SIC sector k–year t level and restrict the sample to destinations that ever receive an SWF deal in any sector. For each destination-sector (j, k), let t^*_{jk} be the first year in which any foreign SWF invests in sector k of destination j. We define the event indicator $\text{TreatPost}^k_{jt} \equiv \mathbb{1}\{t \geq t^*_{jk}\}$, which varies at the (j, k, t) level and is common to all competitor origins o serving (j, k). To avoid mechanical effects from including SWF-investing countries, we exclude all country-pairs that are ever associated with SWF investments. We estimate:

$$\mathbb{E}\left[Y_{ojkt} \mid \cdot\right] = \exp\left\{\beta\, \text{TreatPost}^k_{jt} + \mu_{ojk} + \nu_{ojt} + \lambda' Z_{ojkt}\right\}, \tag{7}$$

where Y_{ojkt} denotes exports from non-SWF investing origin o to destination j in sector k and year t. The specification compares, within each non-SWF investing origin-destination pair, whether exports to sectors that receive SWF investments change relative to sectors that do not receive such investments. A significantly negative β would indicate trade diversion—that is, significant crowd-out of other suppliers when SWF investments occur.

Results in Table 7 show no evidence of diversion. The point estimates are economically small and statistically indistinguishable from zero across all non-investing origins. Because our earlier results show that export gains are concentrated among non-advanced-economy origins, we also test for crowd-out within this group specifically; the null holds. At the destination-sector level at which we can measure it, the market share gained by SWF-backed exporters does not come at the expense of other foreign suppliers—SWF-driven export expansion constitutes net trade creation.

7.2 Trade Multiplier and Policy Counterfactuals

Trade multiplier. Our estimates imply an annual trade multiplier of approximately 0.15: each dollar of SWF capital generates roughly 15 cents in additional exports per year. Because SWF stakes are typically held for a decade or more, the cumulative export gain over the holding period is an order of magnitude larger. A $600 million inaugural investment that raises annual exports by 9.8% ($89 million) would generate roughly $890 million in cumulative export gains over a ten-year holding period—a multiplier of approximately 1.5 on the original equity stake.

Policy counterfactual: the cost of investment screening. The FIRRMA results allow a back-of-envelope policy counterfactual. Annual inbound SWF investment to the US fell from over $65 billion in 2016–2017 to roughly $15 billion in 2018, a decline of approximately $50 billion (Figure 3). Applying our trade multiplier, the diversion of this capital to alternative destinations generated on the order of $7.5 billion in additional annual exports for non-advanced-economy origins—gains that would not have materialized absent the regulatory shock. Conversely, blocking SWF entry more broadly would forgo these export-promoting effects. For countries designing foreign-investment screening regimes, our evidence suggests that blanket restrictions on sovereign investors carry unintended costs (see also Paine, Townsend and Xu, 2025, on the costs of restricting foreign investment). By discouraging SWF entry, such policies could reduce market access for non-advanced-country exporters—the very economies that benefit most.

A development tool. For non-advanced countries considering the establishment or expansion of sovereign wealth funds, our findings point to a pathway for economic upgrading that operates through private-market equity rather than traditional export subsidies or trade agreements. The absence of crowd-out implies that SWF-driven trade expansion need not come at the expense of incumbent suppliers, easing one of the principal concerns in the policy debate over state capital. This pathway is most directly available to resource-rich economies with existing sovereign savings—the Gulf states, Southeast Asian exporters, and commodity producers in Africa—though whether newly established SWFs can replicate these effects for a broader set of non-advanced countries remains an open question.

8 Conclusion

Exporters from countries with weak institutions face a credibility gap that limits their access to advanced markets. This paper shows that sovereign wealth fund investments abroad can bridge that gap. Using a novel dataset of 3,051 cross-border private-market deals and exploiting the 2018 FIRRMA regulatory shock as a natural experiment, we find that SWF equity stakes raise home-country exports by approximately 10%, with no corresponding effect on imports and no evidence of crowd-out.

The mechanism operates through the credibility content of sovereign equity. SWF stakes in destination-market firms create governance access that lowers verification costs and place sovereign assets at risk that substitute for weak domestic enforcement. Consistent with this interpretation, the export response is largest where the credibility gap is widest—among origins with weaker institutions and in contract-intensive sectors—and attenuates when geopolitical instability undermines

the sovereign's own credibility.

These findings recast sovereign wealth funds as instruments of commercial integration, not merely vehicles for financial diversification. For non-advanced economies, private-market sovereign equity offers a pathway for penetrating high-standard markets that traditional policy tools—subsidies, trade agreements, export credit—have not fully addressed. For advanced economies designing investment screening regimes, the results highlight an unintended cost: blanket restrictions on sovereign investors may curtail the very market-access gains that benefit exporters from the developing world. More broadly, the evidence suggests that the institutional barriers shaping global trade patterns are not immutable—they can be bridged when a sovereign puts credible capital on the line.

References

Aghion, Philippe, Jing Cai, Mathias Dewatripont, Luosha Du, Ann Harrison, and Patrick Legros. 2015. "Industrial policy and competition." American economic journal: macroeconomics, 7(4): 1–32. 4

Aiyar, Shekhar, Davide Malacrino, and Andrea F. Presbitero. 2024. "Investing in friends: The role of geopolitical alignment in FDI flows." European Journal of Political Economy, 83: 102508. 5

Alfaro, Laura, and Andrew Charlton. 2007. "Intra-Industry Foreign Direct Investment." In NBER Working Paper Series. Vol. 13447. National Bureau of Economic Research. 5

Anderson, James E, and Douglas Marcouiller. 2002. "Insecurity and the Pattern of Trade: An Empirical Investigation." Review of Economics and Statistics, 84(2): 342–352. 6

Anderson, James E, and Eric Van Wincoop. 2003. "Gravity with gravitas: A solution to the border puzzle." American economic review, 93(1): 170–192. 7, 10, 17

Antràs, Pol, and Stephen R. Yeaple. 2014. "Multinational Firms and the Structure of International Trade." In Handbook of International Economics. Vol. 4, , ed. Gita Gopinath, Elhanan Helpman and Kenneth Rogoff, 55–130. Elsevier. 5

Antràs, Pol, Teresa C. Fort, and Felix Tintelnot. 2017. "The Margins of Global Sourcing: Theory and Evidence from US Firms." American Economic Review, 107(9): 2514–2564. 4

Arkolakis, Costas. 2010. "Market Penetration Costs and the New Consumers Margin in International Trade." Journal of Political Economy, 118(6): 1151–1199. 4

Baier, Scott L, and Jeffrey H Bergstrand. 2007. "Do free trade agreements actually increase members' international trade?" Journal of international Economics, 71(1): 72–95. 17

Bailey, Michael A., Anton Strezhnev, and Erik Voeten. 2017. "Estimating Dynamic State Preferences from United Nations Voting Data." Journal of Conflict Resolution, 61: 430–456. 9

Baker, Andrew C, David F Larcker, and Charles CY Wang. 2022. "How much should we trust staggered difference-in-differences estimates?" Journal of Financial Economics, 144(2): 370–395. 17

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott. 2018. "Global Firms." Journal of Economic Literature, 56(2): 565–619. 4

Bernstein, Shai, Josh Lerner, and Antoinette Schoar. 2013. "The investment strategies of sovereign wealth funds." Journal of Economic Perspectives, 27(2): 219–238. 5

Bertoni, Fabio, and Stefano Lugo. 2014. "The effect of sovereign wealth funds on the credit risk of their portfolio companies." Journal of Corporate Finance, 27: 21–35. 5

Bortolotti, Bernardo, Veljko Fotak, and William L. Megginson. 2015. "The Sovereign Wealth Fund Discount: Evidence from Public Equity Investments." Review of Financial Studies, 28: 2993–3035. 5

Broda, Christian, and David E. Weinstein. 2006. "Globalization and the Gains from Variety." The Quarterly Journal of Economics, 121(2): 541–585. 9, 22

Caldara, Dario, and Matteo Iacoviello. 2022. "Measuring Geopolitical Risk." American Economic Review, 112(4): 1194–1225. 9

Callaway, Brantly, and Pedro H C Sant'Anna. 2021. "Difference-in-Differences with Multiple Time Periods." Journal of Econometrics, 225(2): 200–230. 17

Chhaochharia, Vidhi, Luc Laeven, Olivier Blanchard, Stijn Claessens, Udaibir Das, Giovanni Dell'ariccia, Joseph Fan, Paolo Fulghieri, Luigi Guiso, Steve Kaplan, Robert Kosowski, Ross Levine, Adnan Mazerai, Antoinette Schoar, Vikrant Vig, Yishay Yafeh, and Luigi Zingales. 2008. "The Investment Allocation of Sovereign Wealth Funds." 5

Clayton, Christopher, Matteo Maggiori, and Jesse Schreger. 2023. "A Framework for Geoeconomics." SSRN Electronic Journal. 5

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, David Altman, Fabio Angiolillo, Michael Bernhard, Agnes Cornell, M. Steven Fish, Linnea Fox, Lisa Gastaldi, Haakon Gjerløw, Adam Glynn, Ana Good God, Sandra Grahn, Allen Hicken, Katrin Kinzelbach, Joshua Krusell, Kyle L. Marquardt, Kelly McMann, Valeriya Mechkova, Juraj Medzihorsky, Natalia Natsika, Anja Neundorf, Pamela Paxton, Daniel Pemstein, Johannes von Römer, Brigitte Seim, Rachel Sigman, Svend-Erik Skaaning, Jeffrey Staton, Aksel Sundström, Marcus Tannenberg, Eitan Tzelgov, Yi-ting Wang, Felix Wiebrecht, Tore Wig, Steven Wilson, and Daniel Ziblatt. 2025. "V-Dem [Country-Year/Country-Date] Dataset v15." V-Dem Codebook, www.v-dem.net. 9

Dewenter, Kathryn L., Xi Han, and Paul H. Malatesta. 2010. "Firm values and sovereign wealth fund investments." Journal of Financial Economics, 98: 256–278. 5

Disdier, Anne-Célia, Lionel Fontagné, and Mondher Mimouni. 2008. "The Impact of Regulations on Agricultural Trade: Evidence from the SPS and TBT Agreements." American Journal of Agricultural Economics, 90(2): 336–350. 4

Goodman-Bacon, Andrew. 2021. "Difference-in-differences with variation in treatment timing." Journal of econometrics, 225(2): 254–277. 17

Harrison, Ann, and Andrés Rodríguez-Clare. 2010. "Trade, foreign investment, and industrial policy for developing countries." Handbook of development economics, 5: 4039–4214. 4

Head, Keith, and John Ries. 2001. "Overseas Investment and Firm Exports." Review of International Economics, 9(1): 108–122. 5

Helpman, Elhanan. 1984. "A Simple Theory of International Trade with Multinational Corporations." Journal of Political Economy, 92: 451–471. 5

Helpman, Elhanan, Marc J Melitz, and Stephen R Yeaple. 2004. "Export Versus FDI with Heterogeneous Firms." American Economic Review, 94(1): 300–316. 5

Hummels, David, and Peter J. Klenow. 2005. "The Variety and Quality of a Nation's Exports." American Economic Review, 95(3): 704–723. 1

Juhász, Réka, Nathan Lane, and Dani Rodrik. 2024. "The new economics of industrial policy." Annual Review of Economics, 16(1): 213–242. 1, 4

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi. 2011. "The worldwide governance indicators: Methodology and analytical issues1." Hague journal on the rule of law, 3(2): 220–246. 9

Kleinman, Benny, Ernest Liu, and Stephen J Redding. 2024. "International friends and enemies." American Economic Journal: Macroeconomics, 16(4): 350–385. 5

Knill, April, Bong-Soo Lee, and Nathan Mauck. 2012. "Bilateral political relations and sovereign wealth fund investment." Journal of Corporate Finance, 18(1): 108–123. 5, 10

Kotter, Jason, and Ugur Lel. 2011. "Friends or foes? Target selection decisions of sovereign wealth funds and their consequences." Journal of Financial Economics, 101: 360–381. 5

Levchenko, Andrei A. 2007. "Institutional quality and international trade." The Review of Economic Studies, 74(3): 791–819. 1, 4, 6

López, Diego. 2023. "SWF 3.0: How sovereign wealth funds navigated COVID-19 and changed forever." Journal of International Business Policy, 1. 12

Macchiavello, Rocco, and Ameet Morjaria. 2015. "The Value of Relationships: Evidence from a Supply Shock to Kenyan Rose Exports." American Economic Review, 105(9): 2911–2945. 22

Maskus, Keith E., Tsunehiro Otsuki, and John S. Wilson. 2005. "The Cost of Compliance with Product Standards for Firms in Developing Countries: An Econometric Study." World Bank Policy Research Working Paper, , (3590). 4

Matray, Adrien, Karsten Müller, Chenzi Xu, and Poorya Kabir. 2024. "EXIM's exit: The real effects of trade financing by export credit agencies." National Bureau of Economic Research. 1, 3, 4, 13, 19, 23, 6

Musacchio, Aldo, Sergio Lazzarini, Pedro Makhoul, and Emily Simmons. 2017. "The role and impact of Development Banks." World bank working paper. 4

Nunn, Nathan. 2007. "Relationship-specificity, incomplete contracts, and the pattern of trade." The Quarterly Journal of Economics, 122(2): 569–600. 1, 4, 6, 8, 9, 19, 22

Paine, Fiona, Richard R. Townsend, and Ting Xu. 2025. "Should Governments Restrict Foreign Investments in Startups?" Working Paper. 25

Portes, Richard, and Hélène Rey. 2005. "The Determinants of Cross-Border Equity Flows." Journal of International Economics, 65: 269–296. 7, 10, 22

Ramondo, Natalia, Andrés Rodríguez-Clare, and Felix Tintelnot. 2015. "Multinational Production: Data and Stylized Facts." American Economic Review, 105: 530–536. 5

Rauch, James E. 1999. "Networks versus Markets in International Trade." Journal of International Economics, 48(1): 7–35. 4, 6, 8, 9, 19, 21

Rodrik, Dani. 1994. "Industrial Organization and Product Quality: Evidence from South Korean and Taiwanese Exports." In Empirical Studies of Strategic Trade Policy, 195–210. 6

Schott, Peter K. 2004. "Across-product versus within-product specialization in international trade." The Quarterly Journal of Economics, 119(2): 647–678. 1

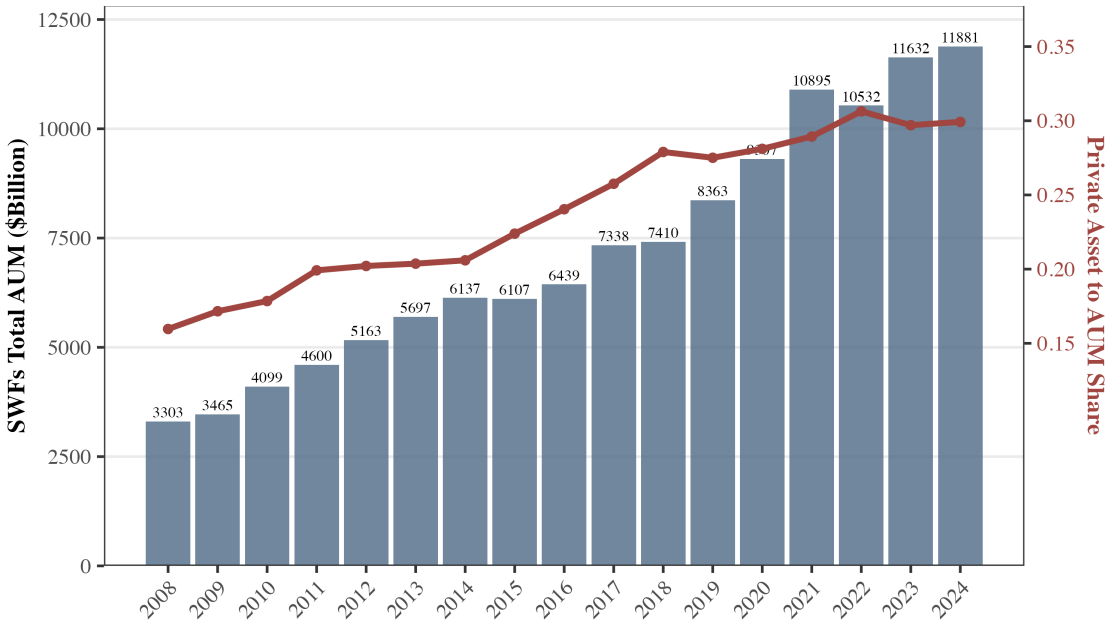
Steenbergen, Victor, Yan Liu, Mauricio Alejandro Pinzon Latorre, and Xiao'ou Zhu. 2023. "The World Bank's Harmonized Bilateral FDI Databases: Methodology, Trends, and Possible Use Cases." World Bank Group, Washington, D.C. 9

Steinwender, Claudia. 2018. "Real Effects of Information Frictions: When the States and the Kingdom Became United." American Economic Review, 108(3): 657–696. 22

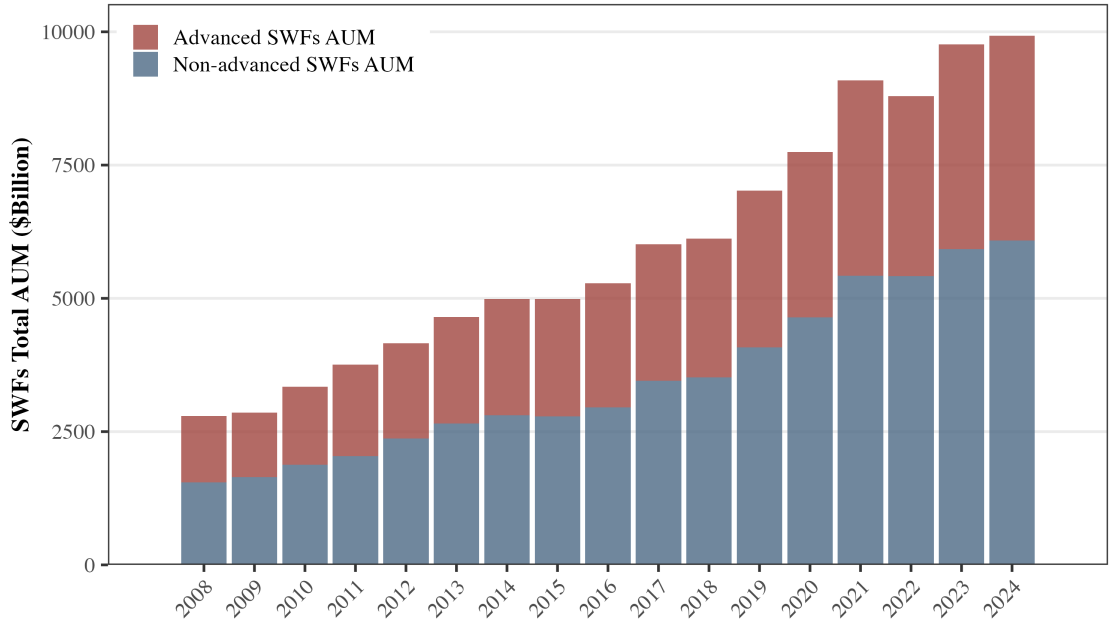
Sun, Liyang, and Sarah Abraham. 2021. "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects." Journal of Econometrics, 225(2): 175–199. 17

Waugh, Michael E. 2010. "International Trade and Income Differences." American Economic Review, 100(5): 2093–2124. 1

Williamson, Oliver E. 1983. "Credible Commitments: Using Hostages to Support Exchange." American Economic Review, 73(4): 519–540. 7



(a) Private Assets and Assets Under Management of Global SWFs



(b) Assets Under Management of Global SWFs by Non-advanced Status

Figure 1: Time Series Trends of Assets Under Management of Global SWFs

Note: Panel A plots the values (USD Billions) of total assets under managements (AUM) held by 179 sovereign wealth funds (left axis) from 97 countries. The line plots the ratio of private assets to AUM (right axis). Private assets include investments in real estate, infrastructure, and private equity. Panel B decomposes the total AUM by country non-advanced status where the grey bars show the AUM managed by SWFs in non-advanced countries and the red bar shows the AUM managed by SWFs in advanced countries.

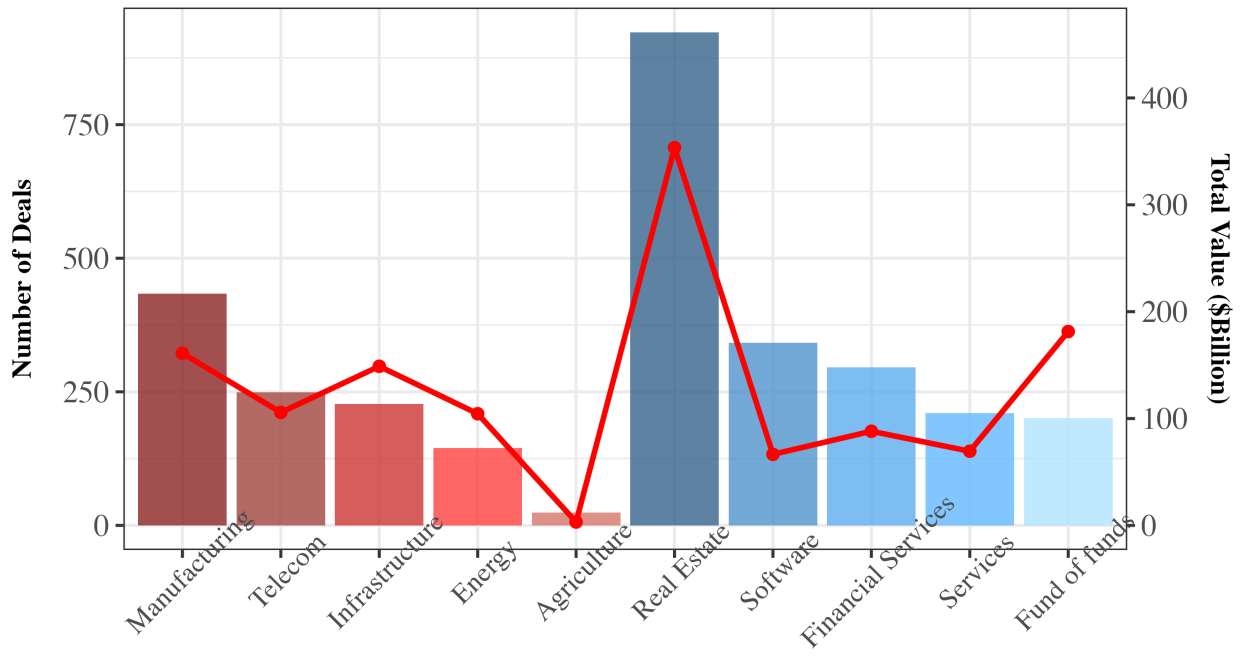


Figure 2: Distribution of SWF Investments

Note: Bars report the total number of SWF private deals by sector (left axis); the line plots the corresponding total investment value (right axis, USD billions). Tradable sectors (Infrastructure, Energy, Manufacturing, Telecommunication, Agriculture) are shaded in red; non-tradables (Real Estate, Financial Services, Software, Services and Fund of funds) in blue.

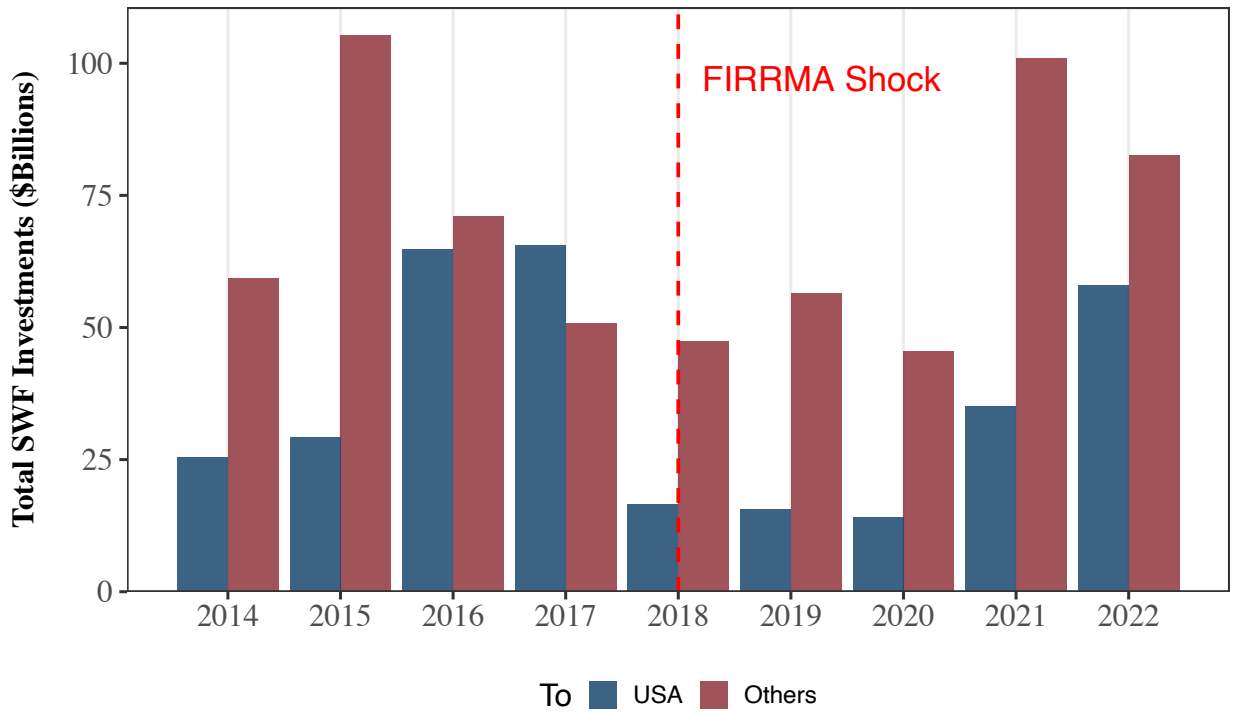
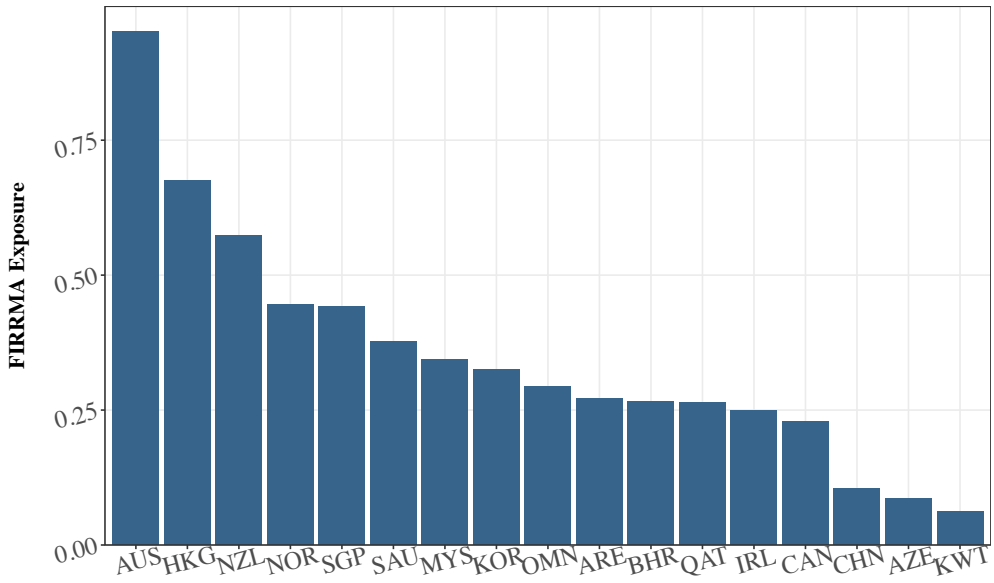
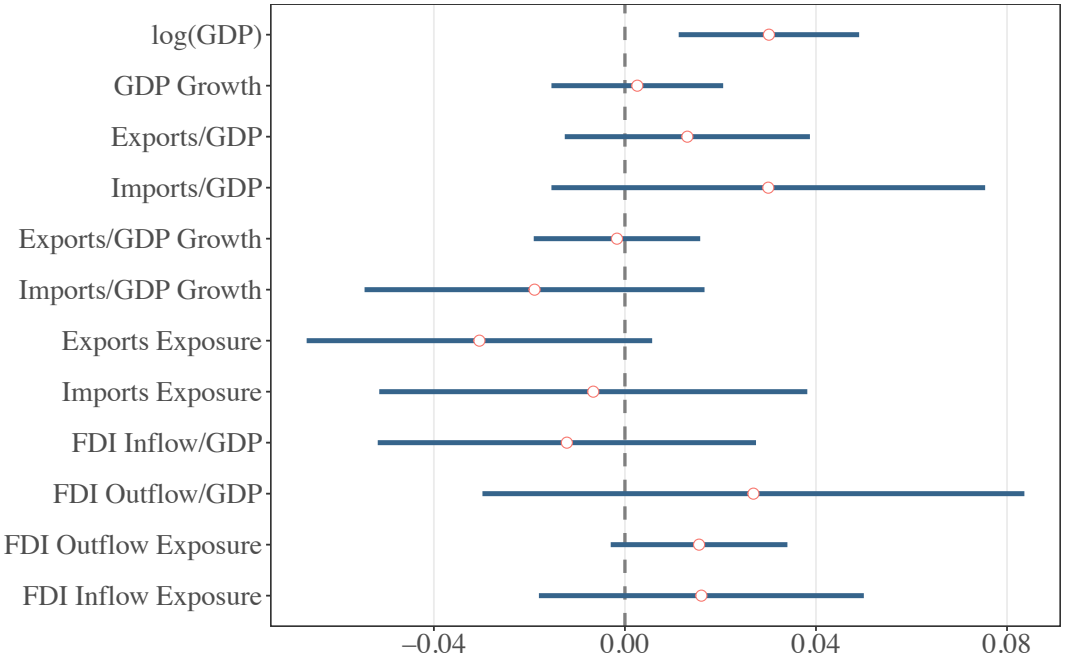


Figure 3: SWF Investments around FIRRMA

Note: The figure plots the annual value (USD billions) of private investments made by non-US sovereign wealth funds in US targets (blue bars); red bars show the investments in non-US destinations. The vertical dashed line marks 2018, when FIRRMA expanded CFIUS scrutiny.



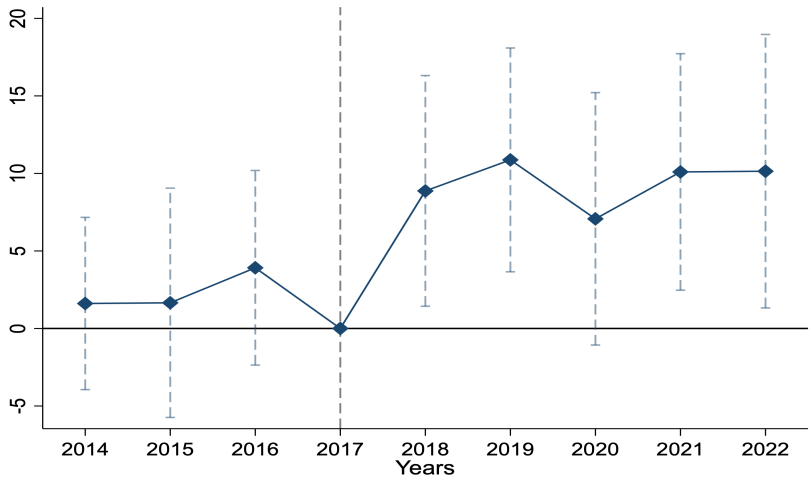
(a) Countries with Positive Exposure Ratio



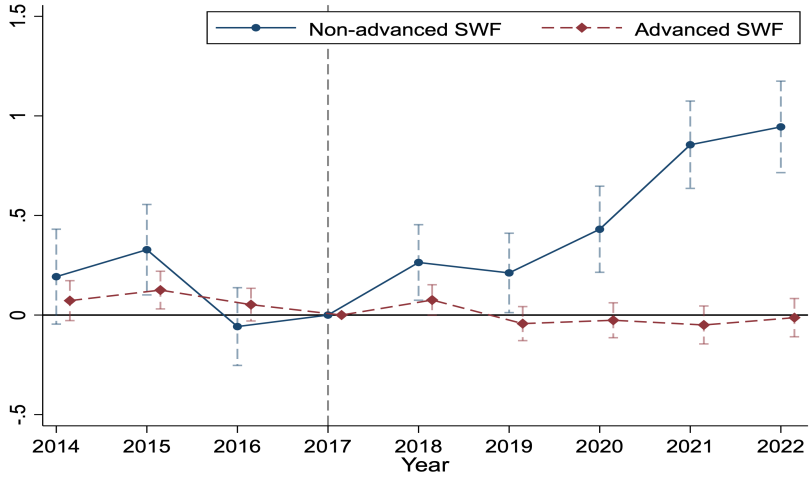
(b) Balance Tests

Figure 4: FIRRMA Exposure: Country Distribution and Balance Checks

Note: FIRRMA Exposure is the average share of each country's SWF investments in the U.S. during 2014–2017. Panel (a) shows SWF countries with positive exposure; Panel (b) reports coefficients from cross-sectional regressions of *FIRRMA Exposure* on pre-FIRRMA characteristics, with dots as point estimates, bars as 95 percent confidence intervals, and the dashed line at zero. Covariates include log(GDP), GDP growth, trade/FDI-to-GDP and its growth, and export/import/FDI exposure measures (constructed analogously as FIRRMA exposure). All variables are standardized to unit variance.



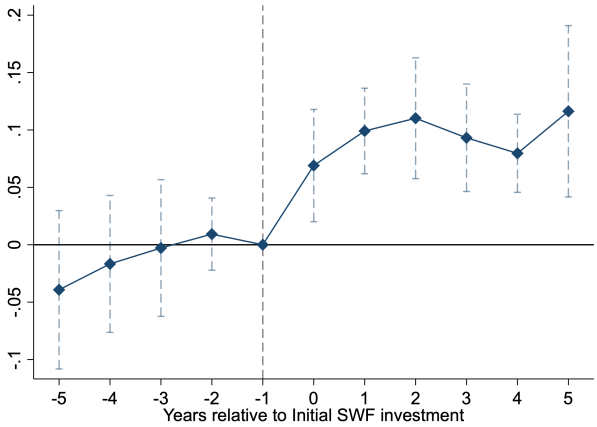
(a) SWF Investments



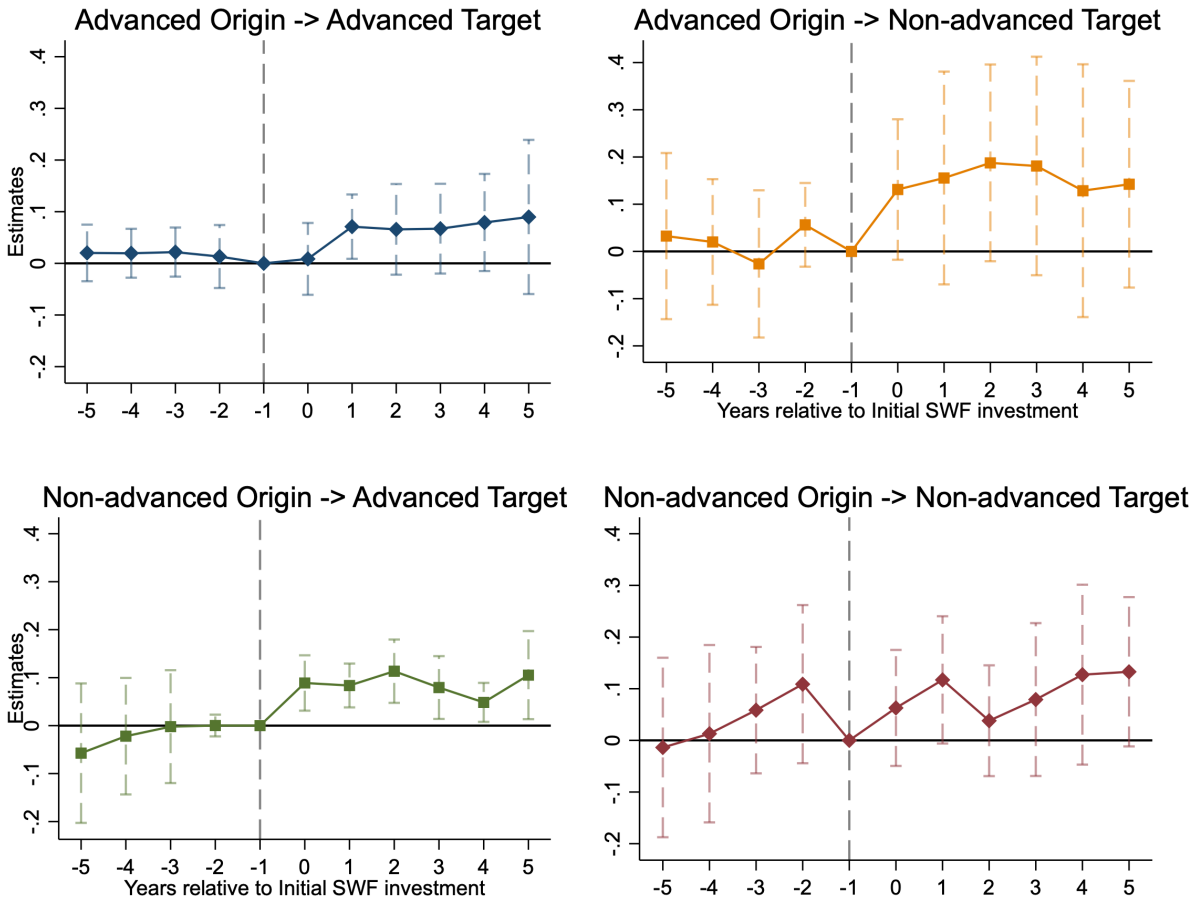
(b) ΔExports

Figure 5: Dynamic Effects of FIRRMA Exposure on SWF Reallocation and Exports

Note: Panels display event-study coefficients from dynamic DiD specifications testing whether countries with greater pre-FIRRMA exposure reallocated SWF investment away from the U.S. toward alternative destinations and, in turn, increased exports to those destinations. The sample is a balanced origin–target–year panel (2014–2022). Treatment intensity, Exposure, is the pre-FIRRMA (2014–2017) share of a country's total SWF private investments allocated to the U.S. Coefficients are from interactions of Exposure with year indicators; 2017 is the omitted year (normalized to zero). Points denote estimates and whiskers 95% confidence intervals; standard errors are clustered by country pair. Panel (a) reports PPML estimates with the dependent variable equal to the value of SWF investment from origin i to non-US target j. Panel (b) reports OLS estimates for $\Delta\text{Exports}_{ijt}$, computed as symmetric (arc-percent) growth relative to the pair-specific 2014–2017 average. All specifications include country-pair and target–year fixed effects and controls for an FTA/WTO indicator, log distance between the most populous cities, log origin-country GDP, a diplomatic-disagreement index, asinh origin-country total trade, and origin-country trade growth.



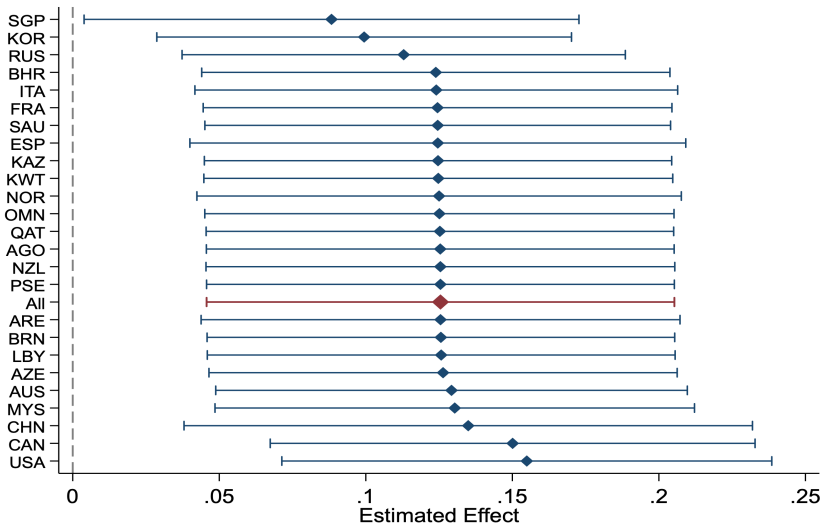
(a) Average Effect



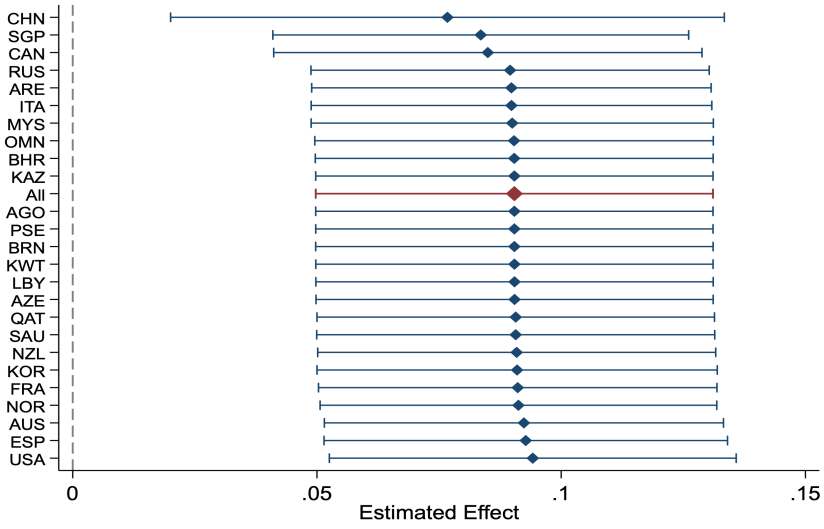
(b) Heterogeneous Effects

Figure 6: Dynamic Impacts of Initial SWF Investment on Exports

Note: This figure plots the estimated dynamic coefficients β_τ from the stacked difference-in-differences event study specification (Equation 5) for bilateral exports. Panel (a) displays the average treatment effect, corresponding to the dynamic extension of the specification reported in Table 3, Panel B column (4). Panel (b) displays heterogeneous effects distinguished by the development status of the origin and destination countries, corresponding to the dynamic extensions of Table 4. In all plots, dots represent point estimates and vertical bars indicate 95% confidence intervals clustered at the cohort level. The vertical dashed line at $\tau = -1$ marks the reference period prior to the initial investment.



(a) Panel PPML



(b) Stacked DiD

Figure 7: Leave-One-Out Effects of Initial SWF Investments on Exports

Note: This figure reports the sensitivity of the estimated impact of initial SWF investments on bilateral exports to the exclusion of individual origin countries. The plotted coefficients represent estimates obtained by re-running the baseline regressions after dropping one SWF investor country at a time. Panel A reports estimates from the PPML fixed effects specification (Table 3, Panel A column 4) and Panel B reports estimates from the stacked difference-in-differences specification (Table 3, Panel B column 4). For each country listed on the vertical axis, the blue diamond indicates the point estimate obtained when that specific country is excluded from the sample, and the horizontal line represents the 90% confidence interval. The red diamond labeled "All" provides the baseline estimate using the full sample for reference. The vertical dashed line marks zero.

Table 1: SWF Private Investments and Trade

	Countries (#)	SWFs (#)	Mean ($m)	Median ($m)	Target Countries (#)
Panel A: Total SWF Private Investments (Deal Level)					
All SWFs	33	51	480	170	101
Non-advanced SWFs	21	33	570	200	93
Advanced SWFs	12	18	391	136	61

Panel B: Top 10 SWF Investing Countries (Country Level)

	Total Value ($m)	Investments (#)	Mean ($m)	Median ($m)
Singapore	414,397	1,021	406	125
United Arab Emirates	343,707	651	528	213
Saudi Arabia	109,158	56	1,949	450
Qatar	108,971	186	586	248
China	98,924	129	767	415
Norway	33,848	88	385	264
Kuwait	30,857	65	475	280
Australia	27,069	70	387	243
Canada	24,958	21	1,188	272
Malaysia	18,647	47	397	150

Panel C: Trade Sample (Industry Level)

	Countries (#)	Mean	Median	SIC 4 digit (#)
Exports (Value, $m)	231	8	0	444
Exports (Quantity, metric tons)	231	7	0	444
Imports (Value, $m)	231	8	0	444
Imports (Quantity, metric tons)	231	7	0	444

Note: The table reports descriptive statistics for SWF investments and trade. Panel A summarizes all SWF private investments over 1995–2022 at the deal level. Panel B reports the top 10 SWF investing countries ranked by total investment value. Panel C summarizes bilateral trade flows over 1995–2022 at the SWF country–target country–year–SIC 4-digit level. All monetary values in USD millions unless otherwise indicated.

Table 2: FIRRMA-Induced Reallocation of SWF Investment and Subsequent Trade

	SWF Investment PPML		$\Delta\text{Exports}_{i,j,t}$			
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure×Post	7.511***		0.413***		0.431***	
	(1.582)		(0.072)		(0.073)	
Exposure^H×Post		3.080***		0.142***		0.150***
		(0.562)		(0.023)		(0.023)
Exposure×Post×Adv. Origin			-0.487***		-0.471***	
			(0.077)		(0.078)	
Exposure^H×Post×Adv. Origin				-0.171***		-0.155***
				(0.028)		(0.030)
Exports Exp×Post					0.159**	0.177***
					(0.065)	(0.065)
Imports Exp×Post					-0.316***	-0.331***
					(0.072)	(0.072)
FDI In Exp×Post					-0.011*	-0.011**
					(0.006)	(0.006)
FDI Out Exp×Post					-0.048	-0.062
					(0.079)	(0.080)
Origin-Target	✓	✓	✓	✓	✓	✓
Target-Year	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Obs.	1,705	1,705	129,808	129,808	129,808	129,808

Notes. This table examines whether the 2018 FIRRMA expansion prompted countries with prior SWF investments in the US to reallocate capital toward non-US targets, and the resulting trade effects. The sample uses a balanced country-pair-year panel (i, j, t) from 2014–2022, where $j \neq$ US. Exposure_i measures each origin country's share of total SWF private investments allocated to the US during 2014–2017; Exposure_i^H indicates above-sample-mean exposure. $\text{Post}_t = 1\{t \geq 2018\}$. Columns (1)–(2) use PPML with SWF investment value as dependent variable. Columns (3)–(6) use OLS with arc-percent growth ΔY_{ijt}. Columns (5)–(6) additionally control for pre-FIRRMA trade and FDI exposure to the US. All specifications include origin-target and target-year fixed effects. Standard errors clustered at the country-pair level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 3: The Impacts of Initial SWF Investments on Bilateral Trade

Panel A: Panel PPML Regression

	Imports		Exports	
	(1)	(2)	(3)	(4)
TreatPost_{ijkt}	-0.015	0.021	0.218***	0.133***
	(0.055)	(0.034)	(0.084)	(0.050)
$\text{asinh}(Z_{ikt})$		0.221***		0.354***
		(0.035)		(0.073)
$\text{asinh}(Z_{jkt})$		-0.041		-0.020
		(0.025)		(0.031)
Origin-Target-SIC4	✓	✓	✓	✓
Origin-Target-Year	✓	✓	✓	✓
SIC4-Year		✓		✓
Obs.	2.66e+06	2.66e+06	2.59e+06	2.59e+06
pseudo-R^2	0.95	0.96	0.97	0.98

Panel B: Stacked DiD Study

	Imports		Exports	
	(1)	(2)	(3)	(4)
$\text{Treat}_k^c \times \text{Post}_t^c$	-0.071*	-0.054	0.104***	0.093***
	(0.043)	(0.037)	(0.029)	(0.025)
$\text{asinh}(Z_{ikt})$		0.171***		0.268***
		(0.057)		(0.082)
$\text{asinh}(Z_{jkt})$		0.051		-0.009
		(0.057)		(0.020)
$\text{asinh}(Z_{kt})$		0.833***		0.787***
		(0.094)		(0.092)
Cohort–SIC4	✓	✓	✓	✓
Cohort-Year	✓	✓	✓	✓
Obs.	620,962	620,962	634,912	634,912
pseudo-R^2	0.98	0.98	0.99	0.99

Notes. This table examines the impact of inaugural SWF investments on bilateral imports (cols. 1–2) and exports (cols. 3–4) over 1995–2022. Panel A reports PPML panel estimates (Equation 4). Panel B reports stacked DiD estimates (Equation 5) with the top five matched non-treated industries as controls. Standard errors clustered at the country-pair level (Panel A) and cohort level (Panel B). $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 4: Heterogeneous Effects of Initial SWF Investments on Bilateral Exports

	Exports							
	Advanced Origin				Non-advanced Origin			
	Adv. Target		Non-Adv. Target		Adv. Target		Non-Adv. Target	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\text{Treat}_k^c \times \text{Post}_t^c$	-0.001	0.061*	0.136	0.121	0.153***	0.079**	0.050	0.058
	(0.036)	(0.037)	(0.105)	(0.106)	(0.029)	(0.035)	(0.073)	(0.074)
asinh(Z_{ikt})		0.125*		0.341***		0.560***		0.279***
		(0.072)		(0.070)		(0.185)		(0.098)
asinh(Z_{jkt})		0.028		0.052		0.010		-0.060***
		(0.035)		(0.036)		(0.041)		(0.018)
asinh(Z_{kt})		0.807***		0.641***		0.553**		0.336***
		(0.083)		(0.138)		(0.224)		(0.117)
Cohort–SIC4		✓		✓		✓		✓
Cohort-Year		✓		✓		✓		✓
Obs.	194,683	194,683	126,476	126,476	177,272	177,272	136,481	136,481
pseudo-R^2	0.99	0.99	0.96	0.96	0.99	0.99	0.98	0.98

Notes. Stacked DiD estimates (Equation 5) of inaugural SWF investment effects on exports, by development status of origin and destination. Columns (1)–(4): advanced origins; Columns (5)–(8): non-advanced origins. Standard errors clustered at the cohort level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 5: Effects of Initial SWF Investments on Bilateral Exports by Sector

Panel A: Non-advanced Origin → Advanced Destination

	Exports				
	Manufacturing	Telecom	Infrastructure	Energy	Agriculture
	(1)	(2)	(3)	(4)	(5)
$\text{Treat}_k^c \times \text{Post}_t^c$	0.056	0.140**	0.060***	0.037	-1.573***
	(0.050)	(0.071)	(0.013)	(0.234)	(0.245)
Cohort–SIC4	✓	✓	✓	✓	✓
Cohort-Year	✓	✓	✓	✓	✓
asinh(Z_{ijkt})	✓	✓	✓	✓	✓
Obs.	104,790	52,775	14,913	2,907	1,887
pseudo-R^2	0.98	0.99	0.99	1.00	0.88

Panel B: Advanced Origin

	Exports				
	Manufacturing	Telecom	Infrastructure	Energy	Agriculture
	(1)	(2)	(3)	(4)	(5)
$\text{Treat}_k^c \times \text{Post}_t^c$	0.092**	0.120	-0.015	-0.146**	-0.226
	(0.040)	(0.122)	(0.106)	(0.059)	(0.148)
Cohort–SIC4	✓	✓	✓	✓	✓
Cohort-Year	✓	✓	✓	✓	✓
asinh(Z_{ijkt})	✓	✓	✓	✓	✓
Obs.	188,352	76,402	45,459	3,833	7,113
pseudo-R^2	0.98	0.99	0.99	1.00	0.98

Notes. Stacked DiD estimates by sector. Panel A: non-advanced-country origins. Panel B: advanced-country origins. Columns (1)–(5): Manufacturing, Telecom, Infrastructure, Energy, Agriculture. Standard errors clustered at the cohort level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 6: Mechanism Tests: Which Trade Frictions Do SWF Investments Mitigate?

Panel A: Credibility Bridge Channel

	Origin Credibility Deficit *(Higher Value = Weaker Institutions)*			Product Opacity *(Higher Value = Harder to Verify)*		
	Rule of Law	Legal Rights	Transparent Laws	Differentiated Goods	Reverse Elasticity	Contract Intensive
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Treat}_k^c \times \text{Post}_t^c \times \bar{F}_{ijk}$	1.005*	2.025*	0.798*	0.432**	0.047***	0.468*
	(0.553)	(1.079)	(0.462)	(0.209)	(0.016)	(0.241)
$\text{Treat}_k^c \times \text{Post}_t^c$	-0.536*	-0.837*	-0.400	-0.339*	0.086*	-0.196
	(0.320)	(0.474)	(0.283)	(0.199)	(0.045)	(0.158)
FEs + Controls	✓	✓	✓	✓	✓	✓
Obs.	160,988	175,560	177,118	177,272	64,437	111,025

Panel B: Standard Trade Costs & Gravity

	Log(Dist)	Common Language	FTA	GPR
	(1)	(2)	(3)	(4)
$\text{Treat}_k^c \times \text{Post}_t^c \times \bar{F}_{ijk}$	-0.044***	0.137***	0.135***	-0.186**
	(0.013)	(0.031)	(0.030)	(0.087)
$\text{Treat}_k^c \times \text{Post}_t^c$	0.445***	0.045**	0.048**	0.186***
	(0.106)	(0.020)	(0.020)	(0.071)
FEs + Controls	✓	✓	✓	✓
Obs.	177,272	177,272	177,272	65,412

Panel C: Alternative Channels

	RCA	UN Voting Dist.	Govt. Consump.	Private Credit	# HS6 Varieties
	(1)	(2)	(3)	(4)	(5)
$\text{Treat}_k^c \times \text{Post}_t^c \times \bar{F}_{ijk}$	-0.017	0.002	0.446	-0.001	
	(0.055)	(0.037)	(2.555)	(0.002)	
$\text{Treat}_k^c \times \text{Post}_t^c$	0.100	0.029	0.004	0.288	-0.004
	(0.107)	(0.113)	(0.423)	(0.234)	(0.009)
FEs + Controls	✓	✓	✓	✓	✓
Obs.	177,272	167,716	176,872	108,862	177,120

Notes. Stacked DiD estimates (Equation 6) on non-advanced-origin → advanced-destination entries. Panel A: interactions with origin credibility deficits (cols. 1–3) and product opacity (cols. 4–6). Panel B: interactions with informational proximity measures (distance, language, FTA) and geopolitical risk. Panel C: alternative channels—RCA, UN voting distance, government consumption, private credit, extensive margin. All regressions include full controls and cohort-SIC4/cohort-year fixed effects. Standard errors clustered at cohort level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 7: Trade Diversion Tests: Effects on Non-SWF Investing Origins

	All Countries		Non-advanced-Origin Countries	
	Exports	Imports	Exports	Imports
	(1)	(2)	(3)	(4)
$\text{TreatPost}_{jt}^{k}$	-0.010	-0.020	0.000	-0.000
	(0.016)	(0.019)	(0.031)	(0.018)
Origin-Target-SIC2	✓	✓	✓	✓
Origin-Target-Year	✓	✓	✓	✓
SIC4-Year	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Obs.	4,617,210	4,782,762	3,315,780	3,497,693

Notes. This table tests for trade diversion by examining whether SWF investments crowd out exports from non-SWF origins. The sample includes bilateral trade from non-SWF origins to destinations that ever receive SWF investments (1995–2022). All country-pairs ever associated with SWF investments are excluded. Standard errors clustered at the country-pair level. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Bridging the Credibility Gap: Sovereign Wealth Funds and International Trade Internet Appendix

This appendix accompanies "Bridging the Credibility Gap: Sovereign Wealth Funds and International Trade" by Jinyuan Zhang and Ran Zhou. Section IA.I provides a micro-foundation for the conceptual framework. Section IA.II provides further details of the SWF investment data construction. Section IA.III reports additional results, with all appendix figures and tables collected at the end.

IA.I Micro-Foundation: Incomplete Contracts and Relationship Capital

This appendix provides a formal micro-foundation for the credibility-gap mechanism described in Section 2. We model an environment in which destination-market buyers face two frictions when transacting with origin-country exporters: costly quality assessment (access friction) and incomplete contract enforcement (enforcement friction). We show that a sovereign wealth fund's equity stake in a destination-market firm reduces both frictions, and we derive a first-order approximation that disciplines the interaction structure in our empirical specifications. Section 5 provides two sources of exogenous variation in SWF presence—the 2018 FIRRMA regulatory shock and staggered inaugural entry—to test the predictions derived here.

IA.I.1 The Baseline Credibility Gap

Consider a representative destination-market buyer in country j sourcing an intermediate input in industry k from an origin-country exporter in country i. In the baseline, before any SWF investment ($K_{ij} = 0$), the input has quality $q \in \{0, 1\}$, valued at $v(1) > 0$ and $v(0) = 0$. We interpret the access and enforcement frictions, c_S and c_E, as per-unit wedges that are fully passed through into effective trade costs under competitive downstream sourcing. The total baseline credibility wedge is

$$F_{ijk}(0) = 1 + c_S(0) + c_E(0), \tag{IA.I}$$

which enters the standard iceberg trade cost as

$$\tau_{ijk} = \tau_{ijk}^{phys} \times F_{ijk}(0). \tag{IA.II}$$

The buyer faces two baseline transaction frictions:

Quality assessment (access friction). The buyer cannot perfectly observe q before transacting and must incur an expected screening cost to verify supplier capabilities. This baseline cost is increasing in the origin's *institutional opacity* $W_i^I \geq 0$ (where higher values indicate weaker, more

opaque institutions) and the product's differentiation/opacity index d_k (e.g., the Rauch index):

$$c_S(0) = \alpha_S \, d_k \, W_i^I, \tag{IA.III}$$

where $\alpha_S > 0$.

Contract enforcement (enforcement friction). Contracts are incomplete. After agreeing on a price, the exporter chooses effort $e \in \{0, 1\}$. High effort ($e = 1$) delivers expected quality $q = 1$ at private cost $\kappa > 0$; low effort ($e = 0$) delivers $q = 0$ at zero cost.

If the exporter shirks ($e = 0$), the probability that the misconduct is discovered by the destination buyer is π_{ij}. This detection is an informational process determined by bilateral proximity $\lambda_{ij} \in (0, 1]$ (e.g., shared language, geographic proximity, FTA):

$$\pi_{ij} = \pi_0 \lambda_{ij}, \tag{IA.IV}$$

where $\pi_0 \in (0, 1)$. Bilateral proximity affects whether shirking is observed, while origin-country legal quality affects what happens conditional on observation.

Upon detection, the exporter faces a legal sanction $\psi_L(W_i^L)$ enforced through the origin country's formal courts, where $W_i^L \geq 0$ represents the origin's *legal weakness* and ψ_L is strictly decreasing in W_i^L. At the untreated baseline, the expected penalty is purely domestic:

$$\Pi(0) = \pi_{ij} \psi_L(W_i^L). \tag{IA.V}$$

We model the buyer's required compensation for incomplete enforcement as a reduced-form hold-up premium that is increasing in the gap between the exporter's effort incentive and the expected sanction, with sensitivity scaled by sectoral contract intensity n_k:

$$c_E(0) = \alpha_E n_k \max\{0, \kappa - \Pi(0)\}, \tag{IA.VI}$$

where $\alpha_E > 0$. If domestic formal institutions are weak, then $\Pi(0) < \kappa$, and the buyer requires a strictly positive baseline hold-up premium $c_E(0) > 0$.

IA.I.2 Bridging the Gap: The Role of SWF Capital

When the origin-country SWF acquires a minority equity stake $K_{ij} > 0$ in the destination downstream firm, it creates a bridge between the origin-country supplier environment and the destination firm's sourcing problem.[25] This reduces the credibility wedge $F_{ijk}(K_{ij}) = 1 + c_S(K_{ij}) + c_E(K_{ij})$ through two channels:

Channel 1: Facilitation ($c_S \downarrow$). Governance access improves information flows, supplier validation, and due diligence, thereby lowering the expected cost of screening:

$$c_S(K_{ij}) = c_S(0) \cdot \frac{1}{1 + \gamma K_{ij}} = \frac{\alpha_S \, d_k \, W_i^I}{1 + \gamma K_{ij}}, \tag{IA.VII}$$

[25] More generally, the same logic extends to investments elsewhere in the destination-side supply chain, provided the SWF gains sufficient informational access and sufficient financial exposure to disruption.

where $\gamma > 0$. The hyperbolic form captures diminishing marginal reductions in screening costs: initial governance access yields the largest information gains, while additional exposure produces progressively smaller improvements.

Channel 2: Commitment ($c_E \downarrow$). Because the SWF holds equity in the destination firm, it internalizes the financial loss from a supply-chain disruption. As a state-linked entity, it may also possess domestic enforcement capacity beyond formal private contract litigation (e.g., regulatory pressure, state-linked financing access, or licensing scrutiny) that can be brought to bear on shirking exporters back home. We assume the SWF's expected loss from disruption is proportional to its exposure in the destination firm, while the cost and effectiveness of intervention are absorbed into a reduced-form enforcement parameter.

We write the state-linked penalty as $\psi_K(K_{ij}) = (1 - \theta_{ij})\beta \min\{K_{ij}, \bar{K}^{disc}\}$, where $\beta > 0$ converts asset exposure into effective discipline, $\bar{K}^{disc}$ is the maximum credible intervention, and $\theta_{ij} \in [0, 1)$ captures geopolitical risk. Geopolitical risk attenuates the effectiveness of state-linked discipline by reducing the credibility, willingness, or transmission of SWF intervention. The augmented expected penalty becomes:

$$\Pi(K_{ij}) = \pi_{ij}\Big[\psi_L(W_i^L) + \psi_K(K_{ij})\Big]. \tag{IA.VIII}$$

By increasing the expected penalty, SWF capital reduces the enforcement premium $c_E(K_{ij}) = \alpha_E n_k \max\{0, \kappa - \Pi(K_{ij})\}$ until the incentive constraint becomes slack. Both channels exhibit saturation: governance-based information gains are subject to diminishing returns, and state-linked punishment is capped by the maximum credible intervention $\bar{K}^{disc}$.

IA.I.3 Deriving the Empirical Predictions

Standard gravity yields bilateral trade volumes

$$X_{ijk} \propto (\tau_{ijk}^{phys})^{1-\sigma_k}\big(F_{ijk}(K_{ij})\big)^{1-\sigma_k}, \tag{IA.IX}$$

where $\sigma_k > 1$ is the elasticity of substitution. To connect the model to our empirical PPML specification, we evaluate local comparative statics around the untreated baseline $K_{ij} = 0$, assuming $0 < \bar{K}^{disc}$.

Assuming small baseline frictions so that $\ln F_{ijk} = \ln(1 + c_S + c_E) \approx c_S + c_E$, the semi-elasticity of trade with respect to SWF capital is approximated by the chain rule:

$$\frac{\partial \ln X_{ijk}}{\partial K_{ij}} \approx -(\sigma_k - 1)\left(\frac{\partial c_S}{\partial K_{ij}} + \frac{\partial c_E}{\partial K_{ij}}\right). \tag{IA.X}$$

The marginal reduction in the access friction is

$$\left.\frac{\partial c_S}{\partial K_{ij}}\right|_{K_{ij}=0} = -\alpha_S \gamma d_k W_i^I. \tag{IA.XI}$$

For the kinked enforcement friction, note that $\left.\frac{\partial \Pi}{\partial K_{ij}}\right|_{K_{ij}=0} = \pi_0 \lambda_{ij}(1-\theta_{ij})\beta$, so

$$\left.\frac{\partial c_E}{\partial K_{ij}}\right|_{K_{ij}=0} = -\alpha_E n_k \pi_0 \lambda_{ij}(1-\theta_{ij})\beta \cdot \mathbb{I}\{\Pi(0) < \kappa\}. \tag{IA.XII}$$

A first-order expansion of the log trade-cost component around the untreated baseline, substituting these derivatives, implies a reduced-form semi-elasticity of trade with respect to SWF exposure that is linear in the interaction terms we estimate:

$$\Delta \ln X_{ijk} \approx (\sigma_k - 1)\Delta K_{ij}\Big[\underbrace{\alpha_S \gamma (d_k \cdot W_i^I)}_{\text{Access Relief}} + \underbrace{\alpha_E \beta \pi_0 \big(n_k \cdot \lambda_{ij} \cdot (1-\theta_{ij})\big) \cdot \mathbb{I}\{\Pi(0) < \kappa\}}_{\text{Enforcement Relief}}\Big]. \tag{IA.XIII}$$

This local approximation is not intended to recover the exact nonlinear effect of large reallocations. Rather, it provides the sign structure and interaction terms that discipline our reduced-form PPML specification. The purpose of this appendix is therefore not to claim that the empirical coefficients identify the primitive structural parameters $(\alpha_S, \alpha_E, \beta, \gamma, \pi_0, \kappa)$, but to show that the signs and interaction structure of the reduced-form estimates are consistent with a coherent contracting framework.

Equation (IA.XIII) yields the main testable predictions in the text:

Prediction 1 (Directional Asymmetry). The baseline mechanism implies a first-order effect on origin-country exports to the investment destination because the SWF acquires governance access and disruption exposure on the destination side. Any effect on reverse-direction imports is at most indirect, since the SWF lacks reciprocal governance rights in destination-country exporters and lacks comparable origin-side enforcement leverage over foreign firms. The model therefore predicts a stronger effect on origin-country exports to the investment destination than on reverse-direction imports.

Prediction 2 (Institutional Nonlinearity / Kinked Enforcement Margin). The marginal effect of SWF capital depends on the slackness of the incentive constraint through the indicator $\mathbb{I}\{\Pi(0) < \kappa\}$:

- *Advanced Origins (Low W_i^L):* Formal legal penalties alone are sufficient to deter shirking, so $\Pi(0) \geq \kappa$ and $c_E(0) = 0$. In this region, SWF capital has zero local marginal effect on the enforcement component because the contract is already on the flat side of the kink.
- *Non-Advanced Origins (High W_i^L):* Formal legal penalties are insufficient, so $\Pi(0) < \kappa$ and $c_E(0) > 0$. In this region, SWF capital relaxes the incentive problem and generates a strictly positive marginal trade effect through the enforcement channel.

While the transaction-level incentive constraint creates a discrete kink, aggregating across a continuum of exporter relationships with heterogeneous effort costs (κ) smooths this indicator into a continuous probability. Consequently, at the aggregate country-sector level, a larger share of transactions falls into the constrained regime when formal laws are weak. The marginal trade-creating effect of SWF capital therefore scales continuously and positively with the origin's legal weakness W_i^L, matching the continuous interaction estimates in Table 6. Similarly, the marginal effect scales positively with origin institutional opacity W_i^I.

Prediction 3A (Bridge Effectiveness). The treatment effect scales positively with bilateral

proximity λ_{ij} and negatively with geopolitical risk θ_{ij}, because proximity raises the probability that misconduct is detected while geopolitical risk weakens the effectiveness of state-linked discipline.

Prediction 3B (Sectoral Exposure). The treatment effect is stronger in sectors with high differentiation/opacity d_k through the access channel and in sectors with high contract intensity n_k through the enforcement channel.

Concavity in K. Both channels exhibit saturation. Facilitation displays concavity through the $(1 + \gamma K)^{-1}$ term: the initial stake unlocks governance access, while subsequent capital yields diminishing information gains. Commitment is capped by the maximum credible intervention $\bar{K}^{disc}$: once assets at risk reach the punishment ceiling, additional capital does not strengthen the commitment device.

Note on the Trade Elasticity Interaction. Standard gravity implies that a larger elasticity of substitution σ_k magnifies the trade response to a given proportional reduction in costs, as reflected by the $(\sigma_k - 1)$ term in Equation (IA.XIII). However, this does not rule out larger empirical treatment effects in low-substitutability sectors. The model suggests a reconciliation rather than a contradiction: more differentiated sectors may have much larger underlying information frictions $(d_k \cdot W_i^I)$, so the absolute reduction in the relevant credibility wedge may be significantly larger precisely where substitutability is lower.

IA.II Construction of the SWF Investment Dataset

Step 1: Identifying the SWF universe. We begin by compiling the basic characteristics of sovereign wealth funds (SWFs) covered by Global SWF (GSWF) and the Sovereign Wealth Fund Institute (SWFI). GSWF profiles 64 funds and SWFI profiles 79 funds. Because the universe is small, we manually verify fund identities and basic information. This screening serves two purposes. First, we exclude entities that are not SWFs in the sense relevant to our analysis, including pension funds (which have explicit liabilities to beneficiaries) and state-owned enterprises (which operate real businesses rather than acting as financial investors). For example, we exclude Norway's Government Pension Fund and Shougang Corporation (a Chinese state-owned steel company). Second, we harmonize fund names across sources and remove duplicates (e.g., Government of Singapore Investment Corporation Private Limited is standardized as GIC). This procedure yields 51 institutions, which collectively manage roughly 90 percent of global SWF assets (Table IA.III.1). For each fund, we record its standardized name, assets under management (AUM), year of establishment, and country of origin. A caveat is that AUM rankings do not translate directly into private-market activity: for instance, although NBIM is the largest fund by AUM, it allocates the vast majority of its portfolio to public markets and therefore is not among the most active investors in our private-deals sample.

Step 2: Collecting raw transaction records from five sources. Next, we collect private-market investment transactions undertaken by these 51 SWFs. We treat the SWF-focused platforms (GSWF and SWFI) as the baseline sources and supplement them with three broad commercial transaction databases: S&P Capital IQ, PitchBook, and Mergermarket. Using standardized fund names as search keys, we extract deal-level information covering mergers and acquisitions, venture capital,

private equity, infrastructure, and real estate investments. The raw pulls yield 4,449 transactions from GSWF, 2,858 from SWFI, 3,419 from PitchBook, 2,110 from Capital IQ, and 844 from Mergermarket. After removing domestic transactions and listed-equity deals, we obtain 7,862 candidate private, cross-border transactions. For each record we collect the target name, target country, investment date, investment amount (when available), listing status, and deal descriptors.

Definition of private and cross-border transactions. We define a transaction as private-market if the target is not publicly listed at the time of investment. We exclude all investments in listed firms, including secondary-market purchases and private placements in public equity (PIPEs). We define a transaction as cross-border if the SWF's country of origin differs from the target firm's country of incorporation/headquarters (as recorded by the data provider). Domestic deals are excluded throughout.

Deal value and date harmonization. All data providers report investment dates and (when available) deal values in US dollars, so no currency conversion is required. Deal values are recorded in USD millions; we retain transactions with missing deal values because deal timing and location remain informative for our empirical analysis. We standardize investment dates to a common MM-DD-YYYY format and extract the investment year for each transaction. For staged investments (multiple rounds or tranches), we retain each tranche as a separate observation.

Step 3: De-duplication and cross-source validation. We then construct a clean deal-level panel by removing duplicates and reconciling deal attributes across platforms. Our guiding principle is to treat GSWF and SWFI as the baseline because both sources validate transactions directly with funds; the three broad databases are used primarily to supplement coverage and to cross-check deal characteristics (especially deal values). When the same deal appears in multiple sources with discrepant attributes, we prioritize GSWF/SWFI.

Hierarchy for resolving disagreements across sources. When the same transaction is observed in multiple sources with conflicting fields (e.g., value or date), we apply the following priority rule:

1. GSWF
2. SWFI
3. S&P Capital IQ/PitchBook/Mergermarket

We use the highest-priority source available for the conflicting field and retain source identifiers for all matched observations.

Duplicate detection and manual verification. To identify duplicates, we first standardize target names by stripping punctuation, legal suffixes, and other common string artifacts following Matray et al. (2024). We then apply fuzzy matching within narrow comparison cells defined at the SWF–destination-country–year level. This restriction reflects the fact that most duplicates arise when the same SWF investment in a given target market is recorded with slightly different target strings, dates, or deal sizes across platforms. We use a conservative fuzzy-match threshold of 51 (where 100 denotes an exact match), and for candidate pairs below 50 we additionally screen for shared key words to flag potential duplicates. All candidate matches are manually inspected to eliminate false positives driven by name similarity (e.g., "Vimeo" versus "Vinmec").

Cross-source reliability checks. For deals observed in multiple sources, we assess whether deal values are systematically different across platforms using paired t-tests. For example, there are 747 transactions that match between GSWF and SWFI; the mean recorded deal values are \$693 million and \$658 million, respectively, and the paired t-test yields $p = 0.21$, indicating no systematic difference in deal valuation across the two sources. This evidence supports the reliability of supplementing the SWF-focused platforms with broad transaction databases.

After completing this iterative de-duplication and validation process, the final dataset contains 3,051 private, cross-border transactions by 51 SWFs.

Step 4: Harmonizing industry classifications. Our trade outcomes are organized in Standard Industrial Classification (SIC) codes, so we harmonize deal industries into a common SIC-based taxonomy. Industry classification is non-trivial in private markets: unlike listed firms, private targets often lack standardized industry codes, and the raw industry labels vary across data providers and across countries. We therefore manually construct a crosswalk from provider-specific industry descriptions to two-digit SIC codes. We adopt two-digit SIC codes to reduce sensitivity to fine classification error while capturing the target's main line of business. For example, "Pharmaceutical" is mapped to SIC 28 (Chemicals and Allied Products), which includes pharmaceuticals and related chemical products.

Use of large language models for classification support. We use large language models (ChatGPT and Google Gemini) as assistive tools to (i) propose candidate SIC mappings for heterogeneous industry descriptions and (ii) flag ambiguous cases for human review. LLM outputs are not applied mechanically. Final assignments are determined by the manually constructed crosswalk and corroborated using target-firm information from official websites. When LLM suggestions conflict with the crosswalk, we follow the crosswalk. This procedure is particularly valuable for targets described as holding companies or investment vehicles, where LLMs may default to "financial holding" while website evidence indicates a specific operational sector.

Resolving missing and non-tradable industry labels. For transactions with missing or uninformative labels (e.g., "N.A." or generic "private equity"), we manually review the target firm's official website to identify its primary activity and assign a two-digit SIC code using the crosswalk. A substantial share of private SWF activity falls into sectors that do not map cleanly into tradable SIC industries—notably infrastructure, real estate, finance and service. We retain them as separate non-tradable categories in our descriptive analysis. In specifications that require an SIC assignment to expand coverage, we impute an SIC code for infrastructure transactions based on the origin country's dominant two-digit export sector.[26] Our main results are robust to excluding infrastructure transactions altogether.

Classification coverage and summary. Of the 3,051 transactions, 851 are directly mapped to tradable two-digit SIC industries via the manual crosswalk. These cover all traded goods sectors, including agriculture, energy, manufacturing, construction, wholesale trade, retail trade, and telecommunications. An additional 227 infrastructure transactions—deals in roads, airports, ports, and logistics—receive an imputed SIC code based on the origin country's dominant two-digit

[26] We implement this imputation using the top two-digit export sector computed from trade data of the origin country from 1995 to 2022.

export sector, as described above. Together, these 1,078 transactions form the industry-level analysis sample used in Section 5.2. The remaining 1,973 transactions are classified as non-tradable: real estate, finance, or service sectors that do not map to internationally traded goods industries.

IA.III Additional Results

IA.III.1 Summary Statistics

Table IA.III.3 reports summary statistics for the relevant variables used in the empirical analysis.

IA.III.2 Cross-Country Heterogeneity in Export Specialization

Table IA.III.4 reports the 2022 export composition of the ten largest SWF origin countries, highlighting substantial cross-country heterogeneity in export specialization.

IA.III.3 FIRRMA Import Event Study

Figure IA.III.1 reports dynamic event-study coefficients from the FIRRMA specification using bilateral imports as the dependent variable. For advanced-economy origins, the import response is statistically insignificant throughout. For non-advanced-economy origins, some post-shock coefficients are individually significant, though the pattern is less persistent and economically smaller than the corresponding export response documented in the main text. The contrast between the robust, sustained export effect and the weaker import response reinforces our interpretation that SWF engagement operates primarily through the export-certification channel.

IA.III.4 Robustness: FIRRMA Results Excluding China

Table IA.III.5 re-estimates the FIRRMA specifications excluding China as origin or destination. Both the investment reallocation effect and the subsequent export response remain positive and statistically significant, with magnitudes comparable to the baseline estimates.

IA.III.5 Placebo: FDI Exposure

Table IA.III.6 replaces SWF exposure with non-SWF FDI exposure as a placebo test. The FDI exposure measure shows no corresponding increase in bilateral exports, confirming that the trade response is specific to sovereign investment.

IA.III.6 Robustness: Excluding Infrastructure SIC Imputation

A potential concern is that our industry classification of SWF deals relies partly on imputed SIC codes for infrastructure-related investments, which may introduce measurement error in the treatment variable. Tables IA.III.7 and IA.III.8 re-estimate the FIRRMA and inaugural-entry

specifications after dropping all deals whose SIC codes were imputed from infrastructure sector descriptions. The FIRRMA results remain qualitatively unchanged: the investment reallocation effect and the export response for non-advanced origins retain their sign, magnitude, and statistical significance. Similarly, the stacked DiD estimates continue to show a significant export effect with no corresponding import response. These results confirm that our findings are not driven by the imputation of industry codes for infrastructure deals.

Table IA.III.1: List of SWFs in the Study: Basic Characteristics

Fund	SWF Full Name	SWF Country	Est. Year	AUM ($ Bn)
NBIM	Norges Bank Investment Management	Norway	1997	1,548.12
CIC	China Investment Corporation	China	2007	1,239.94
SAFE IC	State Administration of Foreign Exchange	China	1997	1,075.89
ADIA	Abu Dhabi Investment Authority	United Arab Emirates	1967	967.65
KIA	Kuwait Investment Authority	Kuwait	1953	845.90
GIC	Government of Singapore Investment Corporation	Singapore	1981	769.00
PIF	Public Investment Fund	Saudi Arabia	1971	764.00
HKMA	Hong Kong Monetary Authority	China Hong Kong	1993	550.00
SAMA	SAMA Foreign Holdings	Saudi Arabia	1952	511.20
QIA	Qatar Investment Authority	Qatar	2005	510.40
ICD	Investment Corporation of Dubai	United Arab Emirates	2006	341.16
Temasek	Temasek Holdings	Singapore	1974	287.68
Mubadala	Mubadala Investment Company	United Arab Emirates	1984	276.38
ADQ	Abu Dhabi Developmental Holding Company	United Arab Emirates	2018	196.00
KIC	Korea Investment Corporation	South Korea	2005	189.40
Future Fund	Future Fund Management Agency	Australia	2006	185.87
NWF	National Wealth Fund	Russian Federation	2008	133.41
Saudi NDF	Saudi National Development Fund	Saudi Arabia	2017	132.38
AIMCo	Alberta Investment Management Corporation	Canada	2008	115.94
EIA	Emirates Investment Authority	United Arab Emirates	2007	90.59
Alaska PFC	Alaska Permanent Fund Corporation	United States	1976	80.65
Samruk Kazyna	Sovereign Wealth Fund Samruk-Kazyna JSC	Kazakhstan	2008	77.74
TCorp	New South Wales Treasury Corporation	Australia	1983	75.09
QIC	Queensland Investment Corporation	Australia	1991	69.76
PNB	Permodalan Nasional Berhad	Malaysia	1978	69.42
LIA	Libyan Investment Authority	Libyan Arab Jamahiriya	2006	68.35
SOFAZ	State Oil Fund of the Republic of Azerbaijan	Azerbaijan	1999	56.07
Bpifrance	Banque Publique d'Investissement of France	France	2008	55.75
BIA	Brunei Investment Agency	Brunei	1983	52.54
Texas PSF	Texas Permanent School Fund	United States	1854	52.30
New Mexico SIC	New Mexico State Investment Council	United States	1958	50.04
OIA	Oman Investment Authority	Oman	1980	46.61
EIH	Ethiopian Investment Holdings	Ethiopia	2022	46.32
DIF	Dubai Investment Fund	United Arab Emirates	2024	44.73
NZ Super Fund	New Zealand Superannuation Fund	New Zealand	2001	44.13
DH	Dubai Holding	United Arab Emirates	2004	35.40
FSIF	France Strategic Investment Fund	France	2008	29.00
Khazanah	Khazanah Nasional Berhard	Malaysia	1993	29.32
RDIF	Russia Direct Investment Fund	Russian Federation	2011	28.14
ISIF	Ireland Strategic Investment Fund	Ireland	2014	18.55
Mumtalakat	Bahrain Mumtalakat Holding Company	Bahrain	2006	17.89
FSI	Fondo Strategico Italiano	Italy	2011	11.00
CADF	China-Africa Development Fund	China	2007	10.00
FRC	Constitutional Reserve Fund of Monaco	Monaco	1962	6.15
COFIDES	Compañía Española de Financiación del Desarrollo	Spain	1988	5.53
NSIA	Nigeria Sovereign Investment Authority	Nigeria	2011	2.48
FSDEA	Fundo Soberano de Angola	Angola	2012	2.16
FAP	Fondo de Ahorro de Panama	Panama	2012	1.51
Palestine	Palestine Investment Fund	Palestine	2003	0.96
NDF ANTIGUA	National Development Fund	Antigua and Barbuda	2006	0.50
Agaciro Fund	Agaciro Development Fund	Rwanda	2012	0.30

Note: This table reports basic information for the 51 SWFs in our sample. Assets under management (AUM) are reported in USD billions and refer to the most recent available figures. For the France Strategic Investment Fund (FSIF), we approximate AUM at about US$29 billion based on reported assets of roughly EUR 21.8 billion around 2010. For Fondo Strategico Italiano (FSI), we approximate AUM at about US$11 billion using reported assets of roughly EUR 5.6 billion around 2014. These approximations are used solely to gauge the relative scale of funds and do not enter our empirical analysis.

Table IA.III.2: Gravity Estimates for SWF Investment and Exports

	SWF	SWF (tradable)	Exports	SWF	SWF (tradable)	Exports
	(1)	(2)	(3)	(4)	(5)	(6)
$\log \text{Dist}_{ij}$	0.013	0.301*	-0.569***			
	(0.137)	(0.181)	(0.054)			
Lang_{ij}	0.658**	0.362	0.277**			
	(0.291)	(0.300)	(0.122)			
Colonizer_{ij}	1.747***	1.519***	1.111***			
	(0.352)	(0.398)	(0.189)			
Contig_{ij}	-0.836	0.185	0.388***			
	(0.565)	(0.524)	(0.111)			
FTA_{ijt}	0.839***	0.882**	0.262***	0.337	0.619	0.066*
	(0.288)	(0.398)	(0.097)	(0.309)	(0.611)	(0.034)
$\log(\text{GDP}_i)$	0.248***	0.234***	0.742***			
	(0.042)	(0.057)	(0.023)			
$\log(\text{GDP}_j)$	0.931***	0.770***	0.806***			
	(0.065)	(0.069)	(0.031)			
UNDisagree_{ijt}	0.413***	0.273***	0.058	0.024	1.427	-0.026
	(0.104)	(0.094)	(0.067)	(0.546)	(0.938)	(0.024)
$g^{\text{Trade}}_{ij,t-1}$	-0.300	0.085	0.355***	-0.543**	-0.483	0.239***
	(0.225)	(0.182)	(0.037)	(0.236)	(0.641)	(0.013)
Origin-Year				✓	✓	✓
Target-Year				✓	✓	✓
Origin-Target				✓	✓	✓
Obs.	116,562	116,562	116,562	3,253	1,325	128,944
pseudo-R^2	0.40	0.27	0.86	0.81	0.78	0.99

Notes. PPML gravity regressions on a balanced country-pair × year panel (1995–2022). Columns labeled SWF use bilateral SWF investment flows as the dependent variable; SWF (tradable) restricts to deals in tradable sectors. Columns labeled Exports use bilateral export values. Standard errors clustered at the country-pair level. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table IA.III.3: Summary Statistics by Different Tests

Variable	Obs	Mean	Std. Dev.
Panel A: Gravity Estimates (Country-pair-year level)			
SWF ($m)	156,055	8.145	247.310
SWF tradable ($m)	156,055	2.290	101.711
Exports ($m)	156,055	1,136.713	8,931.469
Log Distance	154,673	8.746	0.757
Log GDP (origin)	156,055	19.121	2.026
Log GDP (destination)	145,416	17.067	2.392
Common official language	24,061	1.000	0.000
Colonial ties	13,370	1.000	0.000
FTA/WTO	17,500	1.000	0.000
Diplomatic disagreement	156,055	0.900	0.863
Lagged trade growth	138,428	0.064	0.867
Panel B: SWF Initial Entry Test (Country-pair-year-SIC 4-digit level)			
Exports ($m)	2,738,752	22.839	437.483
Imports ($m)	2,738,752	16.569	249.094
Treatment × Post	77,671	1.000	0.000
asinh(SWF industry trade)	2,738,752	5.365	2.405
asinh(Target industry trade)	2,738,752	5.605	2.432
asinh(World industry trade)	2,738,752	10.355	1.558
Panel C: FIRRMA Exposure Test (Country-pair-year level)			
Export growth (arc-%)	135,624	-0.178	0.948
Exposure × Post	74,810	0.074	0.173
Positive exposure × Post	15,986	1.000	0.000
FTA/WTO	21,618	1.000	0.000
Log GDP (origin)	130,117	18.367	2.257
asinh(SWF trade)	135,624	11.220	2.577
SWF trade growth	135,624	0.067	0.251
Diplomatic disagreement	135,624	0.792	0.752
Panel D: Mechanism Tests (Country-pair-year-SIC 4-digit level, Non-advanced Origin → Advanced Destination)			
Rule of Law (origin, 0–1)	161,681	0.582	0.158
Geopolitical Risk (origin)	65,412	0.473	0.314
Differentiated goods (Rauch, 0/1)	177,994	0.792	0.406
Trade elasticity (standardized, reversed)	64,437	0.000	1.000
Contract intensity (Nunn)	111,563	0.515	0.217
Revealed comparative advantage (origin)	177,994	0.727	0.901
Government consumption / GDP (origin)	177,594	0.149	0.045
Private credit / GDP (origin)	110,701	98.729	35.078
Exports (# HS6 varieties)	177,994	4.431	8.466

Table IA.III.4: Top 10 SWF Countries: Export Composition in 2022

	Top 1	Top 2	Top 3	Top 4	Top 5
Panel A: All Destinations					
Singapore	Elec. Equip. (31%)	Oil & Gas (17%)	Chemicals (15%)	Machinery (14%)	Instruments (5%)
United Arab Emirates	Oil & Gas (45%)	Metals (14%)	Misc Mfg. (7%)	Elec. Equip. (7%)	Chemicals (5%)
Saudi Arabia	Oil & Gas (79%)	Chemicals (14%)	Metals (2%)	Food (1%)	Govt. (1%)
Qatar	Oil & Gas (86%)	Chemicals (8%)	Metals (3%)	Mining (1%)	Misc Mfg. (0%)
China	Elec. Equip. (28%)	Machinery (18%)	Chemicals (8%)	Apparel (6%)	Fab. Metals (5%)
Norway	Oil & Gas (77%)	Metals (5%)	Livestock (3%)	Chemicals (3%)	Fish (2%)
Kuwait	Oil & Gas (82%)	Chemicals (10%)	Trans. Equip. (2%)	Food (1%)	Petroleum (1%)

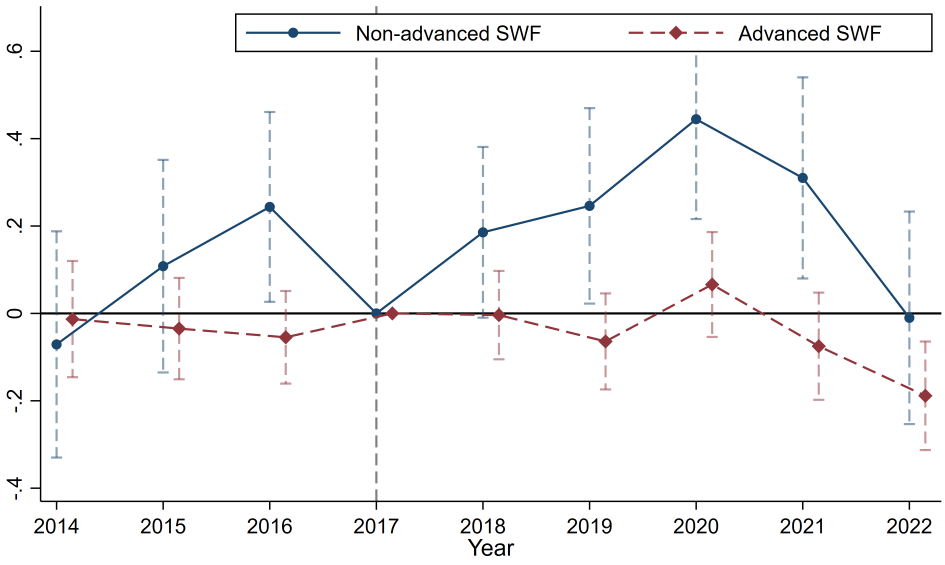


Figure IA.III.1: FIRRMA-Induced Import Response: Dynamic Event Study

Note: This figure plots the dynamic coefficients from a specification analogous to Equation (3), using bilateral import growth as the dependent variable. The solid blue line represents non-advanced-economy SWF origins; the dashed red line represents advanced-economy origins. Vertical bars indicate 95% confidence intervals. The dashed vertical line marks the FIRRMA shock (2018).

Table IA.III.5: FIRRMA-Induced Reallocation of SWF Investment and Trade (Excluding China)

	SWF Investment PPML		$\Delta\text{Exports}_{i,j,t}$			
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure×Post	4.319***		0.416***		0.421***	
	(1.659)		(0.073)		(0.074)	
Exposure^H×Post		1.878***		0.143***		0.146***
		(0.604)		(0.023)		(0.023)
Exposure×Post×Adv. Origin			-0.491***		-0.465***	
			(0.078)		(0.078)	
Exposure^H×Post×Adv. Origin				-0.172***		-0.155***
				(0.029)		(0.029)
Exports Exp×Post					0.160**	0.170***
					(0.065)	(0.064)
Imports Exp×Post					-0.318***	-0.328***
					(0.074)	(0.073)
Origin-Target	✓	✓	✓	✓	✓	✓
Target-Year	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Obs.	126,167	126,167	126,167	126,167	126,167	126,167

Notes. Same specification as Table 2, excluding China as origin or destination. Standard errors clustered at the country-pair level. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table IA.III.6: Placebo Test for FIRRMA-Induced Reallocation of FDI and Trade

	FDI PPML		$\Delta\text{Exports}_{i,j,t}$			
	(1)	(2)	(3)	(4)	(5)	(6)
FDI Exposure×Post	1.098		-0.009		-0.087	
	(1.096)		(0.109)		(0.114)	
FDI Exposure^{H}×Post		-0.240		-0.022		-0.028
		(0.208)		(0.019)		(0.019)
FDI Exposure×Post×Adv. Origin			-0.771***		-0.684***	
			(0.187)		(0.187)	
FDI Exposure^{H}×Post×Adv. Origin				-0.023		-0.013
				(0.030)		(0.030)
Exports Exp×Post					0.192**	0.188***
					(0.070)	(0.068)
Imports Exp×Post					-0.327***	-0.325***
					(0.078)	(0.077)
Origin-Target	✓	✓	✓	✓	✓	✓
Target-Year	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Obs.	27,346	27,346	78,481	78,481	78,481	78,481

Notes. Same specification as Table 2, replacing SWF exposure with FDI exposure. Standard errors clustered at the country-pair level. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table IA.III.7: FIRRMA-Induced Reallocation and Trade (Excluding Infrastructure SIC Imputation)

	SWF Investment PPML		$\Delta\text{Exports}_{i,j,t}$			
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure×Post	7.625***		0.412***		0.429***	
	(1.599)		(0.072)		(0.073)	
Exposure^H×Post		3.173***		0.142***		0.150***
		(0.600)		(0.023)		(0.023)
Exposure×Post×Adv. Origin			-0.486***		-0.470***	
			(0.077)		(0.078)	
Exposure^H×Post×Adv. Origin				-0.171***		-0.155***
				(0.028)		(0.030)
Exports Exp×Post					0.160**	0.178***
					(0.065)	(0.065)
Imports Exp×Post					-0.316***	-0.332***
					(0.072)	(0.072)
FDI In Exp×Post					-0.011*	-0.011**
					(0.006)	(0.006)
FDI Out Exp×Post					-0.046	-0.060
					(0.079)	(0.080)
Origin-Target	✓	✓	✓	✓	✓	✓
Target-Year	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Obs.	1,705	1,705	129,808	129,808	129,808	129,808

Notes. Same specification as Table 2, excluding all SWF deals whose SIC codes were imputed from infrastructure sector descriptions. Standard errors clustered at the country-pair level. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table IA.III.8: Impact of First SWF Investment on Trade (Excluding Infrastructure SIC Imputation)

Panel A: Panel PPML Regression

	Imports		Exports	
	(1)	(2)	(3)	(4)
TreatPost_{ijkt}	-0.008	0.047	0.268**	0.115*
	(0.065)	(0.038)	(0.117)	(0.061)
$\text{asinh}(Z_{ikt})$		0.193***		0.346***
		(0.034)		(0.065)
$\text{asinh}(Z_{jkt})$		-0.037		0.003
		(0.026)		(0.022)
Origin-Target-SIC4	✓	✓	✓	✓
Origin-Target-Year	✓	✓	✓	✓
SIC4-Year		✓		✓
Obs.	2.45e+06	2.45e+06	2.38e+06	2.38e+06
pseudo-R^2	0.95	0.96	0.97	0.98

Panel B: Stacked DiD Study

	Imports		Exports	
	(1)	(2)	(3)	(4)
$\text{Treat}_k^c \times \text{Post}_t^c$	-0.104**	-0.067*	0.072	0.106**
	(0.048)	(0.040)	(0.047)	(0.045)
$\text{asinh}(Z_{ikt})$		0.194***		0.216***
		(0.045)		(0.072)
$\text{asinh}(Z_{jkt})$		0.020		0.007
		(0.059)		(0.022)
$\text{asinh}(Z_{kt})$		0.825***		0.837***
		(0.092)		(0.095)
Cohort–SIC4	✓	✓	✓	✓
Cohort-Year	✓	✓	✓	✓
Obs.	543,462	543,462	555,134	555,134
pseudo-R^2	0.98	0.98	0.98	0.99

Notes. Same specification as Table 3, excluding all SWF deals whose SIC codes were imputed from infrastructure sector descriptions. Panel A reports PPML panel estimates; Panel B reports stacked DiD estimates. Standard errors clustered at the country-pair level (Panel A) or cohort level (Panel B). $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.