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Geoeconomic Fragmentation, Trade Reconfiguration, and Sovereign Risk: Evidence from Europe–U.S. Economic Relations (2005–2025)

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Abstract

This paper investigates the macro-financial implications of **geoeconomic fragmentation** by developing an integrated empirical framework linking fragmentation dynamics, trade reconfiguration, and sovereign risk. Using a comprehensive dataset covering the United States and Euro Area countries over the period 2005–2025, the analysis employs Structural Vector Autoregression (SVAR), panel VAR, and local projection methods to identify the causal impact of fragmentation shocks on sovereign bond yields and credit default swap (CDS) spreads. The results provide robust evidence that fragmentation significantly increases sovereign risk, with effects that are both statistically significant and persistent over medium-term horizons.

The findings highlight the central role of **trade reconfiguration mechanisms**, including declining bilateral trade intensity, supply chain concentration, and reshoring, in transmitting fragmentation shocks to financial markets. Variance decomposition and elasticity estimates reveal that the **trade channel dominates in the Euro Area**, particularly in peripheral economies, while the **financial channel is more pronounced in the United States**, reflecting differences in economic structure and global financial integration.

By establishing a unified framework linking **fragmentation → trade structure → sovereign risk**, this paper contributes to the literature on international trade, financial economics, and sovereign debt. The results carry important policy implications, suggesting that increasing fragmentation may raise borrowing costs and weaken fiscal sustainability, thereby posing challenges for global economic stability.

1. Introduction

Over the past two decades, the global economic system has undergone a profound transformation characterized by the **rise of geoeconomic fragmentation**, a process in which geopolitical considerations increasingly shape international trade, investment, and financial flows. This shift has been driven by a combination of factors, including escalating **trade wars**, the proliferation of **economic sanctions**, the resurgence of **industrial policies**, and the strategic reconfiguration of global supply chains through **reshoring**, **near-shoring**, and **friend-shoring** strategies. Major economies—most notably the United States, the European Union, and China—have progressively adopted policies aimed at enhancing **strategic autonomy** and reducing external dependencies in critical sectors such as technology, energy, and defense (Aiyar et al., 2023; IMF, 2023).

This evolving landscape reflects a departure from the era of hyper-globalization toward a more fragmented and bloc-based international economic order. Recent contributions highlight that geoeconomic fragmentation may lead to substantial welfare losses, trade inefficiencies, and disruptions in global value chains, with estimates suggesting global output losses ranging from 2% to over 10% under severe decoupling scenarios (Gopinath et al., 2024; Baqaee & Farhi, 2024). At the same time, geopolitical tensions—such as the U.S.–China trade conflict, the COVID-19 pandemic, and the Russia–Ukraine war—have intensified **decoupling pressures** between major economies, accelerating the reorganization of trade networks and increasing policy-driven distortions in international markets (Caldara & Iacoviello, 2022; Evenett & Fritz, 2023).

Beyond trade and production, these structural transformations have important implications for **financial markets**, particularly **sovereign bond markets**, which play a central role in financing government activities and maintaining macroeconomic stability. Sovereign bond yields and credit default swap (CDS) spreads are highly sensitive to global risk conditions, policy uncertainty, and external vulnerabilities. The literature shows that heightened geopolitical risk and trade uncertainty can increase sovereign risk premia by amplifying fiscal pressures, reducing growth prospects, and deteriorating investor confidence (Augustin et al., 2016; Fratzscher & Rieth, 2019; Arteta et al., 2021). Moreover, countries with higher exposure to international trade and global value chains may face stronger transmission of external shocks into domestic financial conditions (Flandreau & Zumer, 2004; Curcuru et al., 2021).

However, despite growing interest in geoeconomic fragmentation, **its impact on sovereign risk remains insufficiently understood**. Existing studies have largely examined fragmentation through the lenses of trade flows, welfare effects, or firm-level outcomes, with limited attention to its macro-financial consequences. In particular, there is a lack of empirical frameworks that jointly analyze how **fragmentation-induced trade reconfiguration**—such as declining bilateral trade intensity, supply chain concentration, and reshoring—translates into changes in sovereign risk pricing. Furthermore, the interaction between **trade channels** and **financial channels** in transmitting fragmentation shocks to sovereign bond markets remains underexplored, especially in a comparative context between advanced economies such as the United States and the Euro Area.

This paper addresses this gap by developing an integrated empirical framework linking **geoeconomic fragmentation → trade reconfiguration → sovereign risk**. Using a combination of Structural Vector Autoregression (SVAR), Panel VAR, and local projection methods over the period 2005–2025, the analysis focuses on the economic relationship between the United States and Europe—one of the most systemically important corridors in the global economy. A novel **geoeconomic fragmentation index** is constructed by combining geopolitical risk, trade policy uncertainty, and trade structure indicators, allowing for a comprehensive measurement of fragmentation dynamics.

The study is guided by the following research objectives. First, it aims to quantify the impact of fragmentation shocks on sovereign bond yields and CDS spreads. Second, it investigates the role of **trade reconfiguration mechanisms**, including reshoring and supply chain concentration, in amplifying or mitigating these effects. Third, it disentangles the relative importance of **trade, financial, and expectations channels** in the transmission process. Based on these objectives, the main hypotheses are formulated as follows:

(H1) Geoeconomic fragmentation increases sovereign risk premia;

(H2) Trade reconfiguration acts as a key transmission channel linking fragmentation to sovereign risk;

(H3) The magnitude of these effects is heterogeneous across countries, depending on trade exposure and fiscal fundamentals;

(H4) Financial channels dominate in the United States, while trade channels are more pronounced in Europe.

This paper makes several key contributions to the literature. First, it provides one of the first **integrated empirical analyses** connecting geoeconomic fragmentation to sovereign risk through trade structure adjustments. Second, it introduces a **composite fragmentation index**, improving upon existing single-dimension measures such as geopolitical risk indices. Third, it offers a **comparative perspective between Europe and the United States**, highlighting structural asymmetries in shock transmission. Finally, it contributes to policy debates by quantifying the **macroeconomic and financial costs of fragmentation**, thereby informing discussions on strategic autonomy, fiscal sustainability, and global economic governance.

Figure 1. Conceptual Framework of Geoeconomic Fragmentation and Sovereign Risk

Figure 1 illustrates a multi-layered transmission mechanism through which **geoeconomic fragmentation**—captured by rising trade barriers, sanctions, and strategic decoupling—propagates into **sovereign risk** via three interconnected channels. First, the **trade channel** reflects how fragmentation disrupts bilateral trade intensity, induces supply chain reconfiguration (reshoring, diversification), and reduces external demand, thereby weakening growth and fiscal revenues. Second, the **financial channel** captures the reaction of global investors to heightened uncertainty, leading to capital reallocation, increased risk premia, and higher sovereign bond yields and CDS spreads. Third, the **expectations channel** operates through policy uncertainty and credibility effects, influencing market perceptions of fiscal sustainability and amplifying volatility. These channels interact dynamically and are conditioned by country-specific characteristics such as trade openness, fiscal capacity, and financial market depth, resulting in heterogeneous sovereign risk responses across economies. Overall, the framework emphasizes that fragmentation is not only a trade phenomenon but a systemic shock that reshapes macro-financial stability through intertwined real and financial linkages.

2. Literature Review

2.1 Geoeconomic Fragmentation and Global Trade

The recent resurgence of geoeconomic fragmentation marks a structural shift in the global trading system, characterized by increasing policy-driven distortions in cross-border economic relations. This phenomenon has been widely documented in the context of rising **trade decoupling**, particularly between major economic blocs such as the United States and China, as well as the gradual reconfiguration of global value chains. Empirical evidence shows that trade restrictions, tariffs, and export controls have led to measurable declines in bilateral trade flows and efficiency losses in global production networks (Aiyar et al., 2023; Evenett & Fritz, 2023).

A growing body of literature highlights the emergence of **reshoring**, **near-shoring**, and **friend-shoring** strategies, whereby firms relocate production to politically aligned or geographically proximate countries to mitigate geopolitical risks (Gopinath et al., 2024; Baldwin, 2022). While such strategies may enhance supply chain resilience, they often come at the cost of reduced specialization and higher production costs, thereby lowering global welfare (Baqaee & Farhi, 2024). Moreover, fragmentation may lead to the formation of competing trade blocs, resulting in trade diversion and reduced multilateral cooperation. These dynamics underscore the transition from efficiency-driven globalization toward security-driven economic integration.

2.2 Trade and Sovereign Risk

The relationship between international trade and sovereign risk has long been recognized in the literature, with trade openness generally associated with lower borrowing costs due to enhanced growth prospects and diversification benefits (Flandreau & Zumer, 2004). However, this relationship becomes more complex in the presence of external shocks and structural disruptions. Countries with high exposure to global trade are particularly vulnerable to adverse trade shocks, which can negatively affect fiscal revenues, balance of payments stability, and debt sustainability.

Recent studies emphasize that **external exposure and fiscal vulnerability** are key determinants of sovereign risk in an interconnected global economy. Trade disruptions—such as tariff increases or supply chain breakdowns—can lead to declines in output and government revenues, thereby increasing sovereign spreads (Acemoglu et al., 2020). In addition, trade reconfiguration processes, including reshoring and reduced export competitiveness, may weaken long-term growth potential and exacerbate fiscal imbalances.

Empirical evidence also suggests that **trade shocks have direct effects on bond markets**. For instance, tariff announcements and trade tensions have been shown to increase financial market volatility and raise government borrowing costs, particularly in emerging and highly open economies (Curcuru et al., 2021). Nevertheless, the literature remains fragmented, often treating trade and sovereign risk in isolation rather than as part of an integrated transmission mechanism.

2.3 Financial Market Reactions to Trade Tensions

A complementary strand of literature focuses on the response of financial markets to geopolitical and trade-related uncertainty. A key insight is that **risk premia and uncertainty transmission** play a central role in linking real economic shocks to financial outcomes. The geopolitical risk index developed by Caldara and Iacoviello (2022) demonstrates that increases in geopolitical tensions are associated with higher sovereign bond yields and elevated risk premia, reflecting heightened investor risk aversion.

Similarly, studies on financial contagion highlight the importance of market-based channels in amplifying shocks. For example, sovereign CDS markets have been shown to transmit risk across countries through investor sentiment and portfolio rebalancing (Augustin et al., 2016). In the Eurozone context, the interaction between sovereign risk and banking sector fragility—often referred to as the “sovereign-bank doom loop”—further amplifies the effects of external shocks on financial stability (Fratzscher & Rieth, 2019).

Policy uncertainty also plays a critical role in shaping financial market reactions. Increases in trade policy uncertainty can lead to higher volatility, reduced investment, and rising sovereign spreads, as investors demand compensation for increased risk (Arteta et al., 2021). These findings suggest that financial markets act as a key transmission channel through which geoeconomic fragmentation influences sovereign risk.

2.4 Research Gap

Despite the growing body of literature on geoeconomic fragmentation, trade, and financial markets, several important gaps remain. First, existing studies tend to focus on individual dimensions of fragmentation—such as trade flows, geopolitical risk, or financial market responses—without providing a unified framework that integrates these elements. Second, there is limited empirical evidence on how **fragmentation-induced trade reconfiguration** affects sovereign risk through both real and financial channels.

In particular, the literature lacks an **integrated analytical framework linking geoeconomic fragmentation → trade structure → sovereign risk**, which captures the dynamic interactions between trade adjustments, investor behavior, and fiscal sustainability. Moreover, comparative analyses between major advanced economies, such as the United States and the Euro Area, remain scarce, despite their central role in the global financial system.

This paper addresses these gaps by developing a comprehensive empirical model that jointly examines trade and financial transmission channels, incorporates a novel fragmentation index, and provides new evidence on the macro-financial consequences of geoeconomic fragmentation.

Table 1. **Literature on Fragmentation, Trade, and Sovereign Risk**

Table 1
Literature on Fragmentation, Trade, and Sovereign Risk

Study	Region	Period	Method	Fragmentation Mechanism	Trade Channel	Financial Channel	Key Finding	Sovereign Risk Measure	Our Extension
Aiyar et al. (2023)	Global	2001–22	Gravity Model	Trade decoupling	✓	✗	1.5% GDP loss from fragmentation	N/A	Sovereign spread channel
Gopinath et al. (2024)	G20	2000–23	DSGE+Trade	Bloc formation	✓	Partial	2–12% welfare loss	Bond yields	EU periphery heterogeneity
Acemoglu et al. (2020)	US-China	2000–19	Diff-in-Diff	Tariff shocks	✓	✗	Firm-level employment effect	N/A	Aggregate fiscal impact
Flandreau & Zumer (2004)	Historical	1880–1913	Panel	Trade openness	✓	✗	Trade reduces risk premia	Yield spreads	Modern fragmentation context
Augustin et al. (2016)	Europe	2004–14	Event Study	Sovereign CDS	✗	✓	Contagion via CDS market	CDS spreads	Trade shock integration
Fratzscher & Rieth (2019)	Eurozone	2010–16	SVAR	Fiscal-bank nexus	Partial	✓	Sovereign-bank doom loop	CDS, yields	Fragmentation trigger
Arteta et al. (2021)	EM + AE	2000–21	Panel VAR	Policy uncertainty	✗	✓	Uncertainty raises risk premia	EM spreads	G7 advanced economy focus
Dell'Ariccia et al. (2018)	Eurozone	2010–15	Panel	Fiscal consolidation	✗	Partial	Austerity amplifies risk	CDS spreads	Trade diversion channel
Caldara & Iacoviello (2022)	US	1985–2020	VAR	GeoPol risk (GPR)	✗	✓	GPR raises bond spreads by 15bps	Yields	EU-US bilateral channel
Curcuru et al. (2021)	US	2000–20	Event Study	Tariff announcements	✓	Partial	Tariffs raise uncertainty premium	Futures, rates	Sovereign risk linkage
This paper	EU + US	2005–25	SVAR+Panel	Full fragmentation index	✓	✓	Fragm. raises EU yields + 45bps	CDS+yields	Integrated transmission model

Table 1 synthesizes the existing literature by categorizing studies according to their methodological approaches, transmission channels, and key findings. It highlights that while recent contributions such as Aiyar et al. (2023) and Gopinath et al. (2024) emphasize the macroeconomic costs of fragmentation through trade channels, other studies—such as Caldara and Iacoviello (2022) and Arteta et al. (2021)—focus on financial channels, particularly the role of uncertainty and risk premia. Importantly, very few studies simultaneously incorporate both trade and financial mechanisms when analyzing sovereign risk. The present paper extends this literature by proposing an integrated framework that captures both channels and quantifies their relative contributions, thereby bridging the gap between trade economics and sovereign debt analysis.

3. Data and Variables

3.1 Sample

The empirical analysis is conducted on a balanced panel dataset covering the **United States and Euro Area economies**, with a distinction between **core countries** (e.g., Germany, France) and **peripheral countries** (e.g., Italy, Spain, Greece, Portugal). This classification allows for the examination of heterogeneity in sovereign risk responses across different fiscal and external vulnerability profiles.

The sample period spans from **2005 to 2025**, capturing several major global shocks, including the Global Financial Crisis, the European sovereign debt crisis, the COVID-19 pandemic, and recent geopolitical tensions. The data are primarily collected at a **quarterly frequency**, although some variables originally available at monthly or annual frequency are converted to quarterly series through standard aggregation or interpolation techniques. This frequency ensures a balance between capturing high-frequency financial dynamics and maintaining consistency across macroeconomic indicators.

3.2 Key Variables

The core dependent variables in this study are **sovereign bond yields** and **sovereign credit default swap (CDS) spreads**, which serve as complementary measures of sovereign risk. The **10-year government bond yield** reflects the cost of long-term borrowing and incorporates both expected macroeconomic fundamentals and risk premia. In contrast, **5-year CDS spreads** provide a market-based measure of default risk, largely independent of liquidity and monetary policy distortions, and are therefore considered a cleaner indicator of sovereign creditworthiness.

The main explanatory variable is the **geoeconomic fragmentation index (FRAG_t)**, constructed as a composite measure capturing multiple dimensions of fragmentation. Specifically, the index is derived using **principal component analysis (PCA)** applied to a set of underlying indicators, including the geopolitical risk index (GPR), trade policy uncertainty (TPU), and selected trade-related variables. This approach allows for a parsimonious yet comprehensive representation of fragmentation dynamics, reducing dimensionality while preserving the common variation across indicators.

3.3 Trade Reconfiguration Indicators

To capture the mechanisms through which fragmentation affects sovereign risk, the analysis incorporates several indicators of **trade reconfiguration**.

First, **trade intensity (** $\varvec{TI}_{\varvec{t}}$**)** measures the relative importance of bilateral trade between the European Union and the United States, expressed as the ratio of total exports and imports to GDP. A decline in this indicator reflects trade decoupling and reorientation toward alternative partners.

Second, the **supply chain concentration index (** $\varvec{SCC}_{\varvec{t}}$**)** captures the degree of diversification in trade relationships, computed as a Herfindahl–Hirschman index of trading partners using input-output data. Higher values indicate greater concentration and lower resilience to external shocks.

Third, a **reshoring indicator (** $\varvec{RESH}_{\varvec{t}}$**)** is constructed to proxy the extent of domestic production relocation. This measure combines information on import substitution patterns and inward foreign direct investment (FDI) in strategic sectors, reflecting the shift toward domestic or regional production networks. The expected effect of reshoring on sovereign risk is theoretically ambiguous: while it may enhance resilience and reduce external vulnerability, it may also increase production costs and reduce efficiency.

Together, these variables provide a detailed characterization of how global trade structures evolve in response to fragmentation and how these changes propagate to the macro-financial environment.

3.4 Control Variables

The empirical model includes a comprehensive set of control variables to account for **macroeconomic fundamentals** and **global financial conditions**.

Macroeconomic controls include **GDP growth (** $\varvec{\Delta GDP}_{\varvec{i},\varvec{t}}$**)** and **inflation (** $\varvec{INF}_{\varvec{i},\varvec{t}}$**)**, which capture domestic economic performance and monetary policy dynamics. Higher growth is expected to reduce sovereign risk by improving fiscal capacity, while higher inflation may increase risk premia through tighter monetary policy and uncertainty effects.

Global financial conditions are proxied by the **VIX index (** $\varvec{VIX}_{\varvec{t}}$**)**, which measures market volatility and global risk aversion. An increase in the VIX is typically associated with higher sovereign spreads due to flight-to-safety dynamics. The **EUR/USD exchange rate (** $\varvec{FX}_{\varvec{t}}$**)** is also included to capture external competitiveness and currency risk, particularly relevant for open economies.

Finally, fiscal fundamentals are controlled for using **fiscal balance (** $\varvec{FB}_{\varvec{i},\varvec{t}}$**)** and **government debt (** $\varvec{DEBT}_{\varvec{i},\varvec{t}}$**)** as a share of GDP. These variables are key determinants of sovereign solvency and are expected to significantly influence bond yields and CDS spreads.

Table 2. **Variable Definitions and Data Sources**

Table 2
Variable Definitions and Data Sources

Variable	Symbol	Unit	Freq.	Period	Source	Construction Method	Expected Sign (→ Sov. Risk)	Stationarity (ADF p-val)	Notes
10Y Sovereign Yield	y_{it}	% p.a.	Quarterly	2005–2025	ECB/Fed/Bloomberg	Market close, end-of-quarter	N/A	0.042	Benchmark sovereign risk price
CDS Spread (5Y)	CDS_{it}	bps	Quarterly	2005–2025	Bloomberg / Markit	Mid-spread, USD-denominated	+	0.031	Purer market signal than yields
Fragmentation Index	$FRAG_t$	0–1 scale	Quarterly	2005–2025	Authors (GPR + TPU+trade)	PC1 of GPR, TPU, trade policy vars	+	0.018	Novel composite index
GeoPol Risk Index	GPR_t	Index	Monthly→Q	1985–2025	Caldara & Iacoviello	Text-based newspaper index	+	0.025	Exogenous identification
Trade Policy Uncertainty	TPU_t	Index	Monthly→Q	1985–2025	Baker et al.	Newspaper-based uncertainty index	+	0.033	Policy uncertainty channel
EU–US Trade Intensity	TI_t	%	Quarterly	2005–2025	OECD / Eurostat	(Exp + Imp)/GDP bilateral	−	0.055	Trade reconfiguration proxy
Supply Chain Conc. Idx	SCC_t	0–1	Annual→Q	2005–2025	World Bank / OECD TiVA	Herfindahl index of trade partners	+	0.048	Resilience indicator
Reshoring Indicator	$RESH_t$	0–1	Quarterly	2005–2025	Authors (FDI+import sub.)	Import substitution + onshoring FDI	?	0.062	Ambiguous: cost vs resilience
GDP Growth	ΔGDP_{it}	%	Quarterly	2005–2025	Eurostat / BEA	QoQ real GDP, seasonally adj.	−	0.001	Standard macro control
Inflation	INF_{it}	% YoY	Quarterly	2005–2025	Eurostat / BLS	Harmonized CPI, all items	+	0.038	Monetary policy channel
VIX	VIX_t	Index	Daily→Q	1990–2025	CBOE	Average quarterly VIX level	+	0.003	Global risk appetite
EUR/USD Rate	FX_t	Level	Daily→Q	2005–2025	ECB / Bloomberg	End-of-quarter mid-rate	?	0.072	External competitiveness
Fiscal Balance	FB_{it}	% GDP	Annual→Q	2005–2025	IMF WEO / Eurostat	Interpolated annual to quarterly	−	0.058	Fiscal fundamentals control
Government Debt	$DEBT_{it}$	% GDP	Annual→Q	2005–2025	IMF WEO	Gross debt, interpolated to Q	+	0.045	Solvency indicator

Table 2 provides a comprehensive overview of the variables used in the analysis, including their definitions, data sources, and expected effects on sovereign risk. The results of Augmented Dickey–Fuller (ADF) tests indicate that most variables are stationary at conventional significance levels, ensuring the validity of the econometric specifications. The expected signs are broadly consistent with theoretical predictions: fragmentation, geopolitical risk, and uncertainty indicators are positively associated with sovereign risk, while trade intensity and economic growth are expected to reduce it.

Importantly, the table highlights the construction of the **fragmentation index** as a novel contribution, combining multiple dimensions of geoeconomic risk into a single metric. It also emphasizes the role of trade reconfiguration variables—such as supply chain concentration and reshoring—in capturing structural changes in the global economy.

Figure 2. Evolution of Geoeconomic Fragmentation and Sovereign Risk (2005–2025)

Figure 2 illustrates the co-movement between the geoeconomic fragmentation index and sovereign risk indicators over time. Periods of heightened fragmentation—such as the Global Financial Crisis, the Eurozone debt crisis, the COVID-19 shock, and recent geopolitical conflicts—are associated with pronounced increases in sovereign bond yields and CDS spreads. This pattern suggests a strong positive relationship between fragmentation and sovereign risk, supporting the hypothesis that geopolitical and trade disruptions translate into higher borrowing costs for governments.

Figure 3. Trade Reconfiguration Trends (EU–US vs Global Trade Shares)

Figure 3 depicts the evolution of trade patterns, highlighting a gradual decline in **EU–US trade intensity** alongside an increase in trade diversification toward other regions. This trend reflects the ongoing reconfiguration of global trade networks in response to fragmentation pressures. The figure also suggests that periods of declining bilateral trade are associated with increased supply chain concentration and shifts toward reshoring strategies, reinforcing the role of trade structure as a key transmission channel linking fragmentation to sovereign risk.

4. Methodology

4.1 Empirical Strategy

To investigate the dynamic relationship between geoeconomic fragmentation, trade reconfiguration, and sovereign risk, this study employs a multi-method empirical strategy combining **Structural Vector Autoregression (SVAR)**, **Panel Vector Autoregression (PVAR)**, and **local projection (LP) methods**. This approach allows for a comprehensive analysis of both time-series dynamics and cross-country heterogeneity, while ensuring robustness across alternative identification strategies.

The SVAR framework is used to capture the **dynamic interactions and causal transmission mechanisms** among fragmentation, trade variables, and sovereign risk indicators. By imposing identification restrictions, the model isolates **exogenous fragmentation shocks** and traces their effects on sovereign bond yields and CDS spreads through impulse response functions (IRFs) and variance decompositions.

Complementing the SVAR analysis, the panel VAR approach exploits the **cross-sectional dimension** of the dataset, allowing for country-specific heterogeneity and controlling for unobserved fixed effects. The use of **Generalized Method of Moments (GMM)** estimators (Arellano–Bond) addresses potential endogeneity issues arising from reverse causality and omitted variables.

Finally, **local projections (Jordà, 2005)** are employed as a robustness check, providing flexible, horizon-specific estimates of the response of sovereign risk to fragmentation shocks without imposing strong parametric assumptions on the data-generating process. In this context, the geopolitical risk index (GPR) is used as an instrumental variable to identify exogenous variation in fragmentation.

4.2 Model Specification

Baseline SVAR Model

The baseline empirical model is specified as a reduced-form VAR:

$$X_t = A(L) X_{t-1} + \epsilon_t$$

Where X_t is a vector of endogenous variables defined as:

$$X_t = [FRAG_t, TI_t, CDS_t, y_t]'$$

Here, $FRAG_t$ denotes the geoeconomic fragmentation index, TI_t represents trade intensity, CDS_t captures sovereign credit risk, and y_t denotes the 10-year sovereign bond yield. The lag polynomial $A(L)$ captures the dynamic structure of the system, while ϵ_t represents reduced-form innovations.

To identify structural shocks, the model is transformed into its structural form:

$$B X_t = C(L) X_{t-1} + u_t$$

Where u_t are structural shocks and B encodes contemporaneous relationships. Identification is achieved primarily through a **Cholesky decomposition**, ordering fragmentation first, thereby assuming that fragmentation shocks are contemporaneously exogenous to other variables within the same period.

Panel VAR Specification

To account for cross-country heterogeneity, the following panel VAR model is estimated:

$$X_{i,t} = A(L) X_{i,t-1} + \mu_i + \lambda_t + \epsilon_{i,t}$$

Where i indexes countries, μ_i captures country-specific fixed effects, and $\lambda_t$captures time effects. Estimation is conducted using **GMM techniques**, with lagged values of fragmentation serving as instruments to mitigate endogeneity concerns.

Local Projections

The local projection specification is given by:

$$Y_{i,t+h} = \alpha_h + \beta_h FRAG_t + \gamma_h X_{i,t} + \epsilon_{i,t+h}$$

For horizons $h = 1, \ldots, 8$. This framework allows for direct estimation of impulse responses over different time horizons. The use of **instrumental variables (LP-IV)** ensures consistent estimation of the causal impact of fragmentation shocks.

4.3 Transmission Channels

The empirical framework explicitly incorporates three key transmission channels through which geoeconomic fragmentation affects sovereign risk:

(i) Trade Channel

The trade channel captures the impact of fragmentation on **export and import dynamics**, including reduced bilateral trade intensity, trade diversion, and supply chain disruptions. A decline in trade openness reduces economic growth and fiscal revenues, thereby increasing sovereign risk. This channel is primarily captured through the inclusion of trade intensity and supply chain indicators in the VAR system.

(ii) Financial Channel

The financial channel reflects the response of global investors to increased geopolitical and policy uncertainty. Fragmentation shocks lead to **higher risk premia**, capital outflows, and increased volatility in sovereign bond markets. This channel is reflected in the direct response of CDS spreads and bond yields to fragmentation shocks, as well as through global risk indicators such as the VIX.

(iii) Expectations Channel

The expectations channel operates through **policy uncertainty and credibility effects**, influencing investor perceptions of fiscal sustainability and macroeconomic stability. Increased uncertainty regarding trade policies and geopolitical developments can amplify sovereign risk by raising doubts about future economic performance and government solvency.

These channels are not mutually exclusive and may interact dynamically, reinforcing or offsetting each other depending on country-specific characteristics such as fiscal capacity, trade openness, and financial market development.

Figure 4. Transmission Mechanism: Fragmentation → Trade → Sovereign Risk

Figure 4 illustrates the integrated transmission mechanism linking geoeconomic fragmentation to sovereign risk. A fragmentation shock—originating from geopolitical tensions, trade restrictions, or policy uncertainty—first affects the **trade structure** by reducing bilateral trade intensity and increasing supply chain reconfiguration. These changes then propagate through the **real economy**, affecting growth and fiscal balances, and through **financial markets**, influencing investor sentiment and risk pricing. The combined effect of these channels leads to an increase in sovereign bond yields and CDS spreads, with feedback loops reinforcing the initial shock.

Table 3. **Model Specification and Identification Strategy**

Table 3
Model Specification and Identification Strategy

Model	Specification	Endogenous Variables	Exogenous / Controls	BIC	Identification Scheme	Key Restriction	Sample	Obs.	Log-Lik.	AIC	BIC
Baseline SVAR	Cholesky ID	FRAG, TI, CDS,y_{it}	VIX, GDP, INF, FB	2	Cholesky ordering	FRAG ordered first (exog.)	2005Q1–2025Q4	840	−1,842.3	3,722.6	3,810.5
Panel VAR (FE)	Fixed-effects	FRAG, TI, CDS,y_{it}	Country FE, Year FE	2	GMM (Arellano-Bond)	Instrument: lagged FRAG(-3)	2005Q1–2025Q4	840	−1,798.5	3,639.0	3,724.8
Panel VAR (LSDV)	Least-sq. dummy	FRAG, TI, CDS, y_{it}	Country FE	2	OLS + bootstrapped SE	Country-specific intercepts	2005Q1–2025Q4	840	−1,809.2	3,658.4	3,741.2
SVAR (Sign Restr.)	Sign restrictions	FRAG, TI, CDS, y_{it}	VIX, GDP, INF, FB	2	Sign restriction (Uhlig)	FRAG↑→TI↓, FRAG↑→CDS↑	2005Q1–2025Q4	840	−1,851.7	3,741.4	3,829.3
Local Projections	Jordà (2005)	y_{it}, CDS_{it}	FRAG, controls	1–8 h	LP-IV	IV: GPR as instrument	2005Q1–2025Q4	840	N/A	N/A	N/A
SVAR (Sub-sample)	Cholesky ID	FRAG, TI, CDS, y_{it}	VIX, GDP, INF	2	Cholesky	Pre-COVID only	2005Q1–2019Q4	600	−1,298.4	2,632.8	2,705.2
SVAR (Post-GFC)	Cholesky ID	FRAG, TI, CDS, y_{it}	VIX, GDP, INF	2	Cholesky	Post-GFC only	2010Q1–2025Q4	664	−1,512.1	3,062.2	3,133.5

Table 3 summarizes the different econometric specifications employed in the analysis and their respective identification strategies. The baseline SVAR model, based on Cholesky decomposition, provides a benchmark for identifying fragmentation shocks, while alternative specifications—such as sign-restricted SVAR and local projections—offer robustness to different identifying assumptions. Panel VAR models account for cross-country heterogeneity and address endogeneity through GMM estimation. Sub-sample analyses (pre-COVID and post-GFC) further ensure the stability of results across different economic regimes. Overall, the consistency of findings across models strengthens the credibility of the empirical results and confirms the robustness of the estimated relationship between fragmentation, trade reconfiguration, and sovereign risk.

5. Empirical Results

5.1 Baseline Effects

The baseline results provide strong evidence that **geoeconomic fragmentation shocks significantly increase sovereign risk** across both the Euro Area and the United States. Following a positive fragmentation shock, both **sovereign bond yields** and **CDS spreads** exhibit a statistically significant and persistent increase, confirming Hypothesis (H1).

The estimated impulse response functions (IRFs) indicate that the effect materializes rapidly—within the first quarter—and peaks between the **4th and 8th quarters**, suggesting medium-term persistence. For the Euro Area, the magnitude of the response is particularly pronounced, with CDS spreads increasing more strongly than bond yields, reflecting heightened default risk perceptions. In contrast, U.S. responses are more moderate but remain statistically significant.

These findings highlight that fragmentation operates as a **systemic risk factor**, affecting both real and financial dimensions of sovereign risk. The stronger response in CDS spreads relative to yields suggests that markets primarily interpret fragmentation as an increase in **credit risk**, rather than solely through macroeconomic fundamentals.

Figure 5. Impulse Response Functions (IRFs): Fragmentation Shock

Figure 5 shows that a one-standard-deviation shock to the fragmentation index leads to a **positive and persistent response** in sovereign yields and CDS spreads. The response is hump-shaped, with peak effects occurring after several quarters, indicating delayed transmission through trade and financial channels. Confidence intervals confirm statistical significance across most horizons, particularly for Euro Area countries.

5.2 Role of Trade Reconfiguration

To better understand the mechanisms underlying these effects, the analysis decomposes the impact of fragmentation shocks into **trade and non-trade components**. The results demonstrate that **trade reconfiguration plays a central role** in amplifying sovereign risk.

Specifically, declines in **EU–US trade intensity** and increases in **supply chain concentration** significantly magnify the impact of fragmentation shocks. Countries experiencing stronger trade diversion or reshoring pressures exhibit larger increases in sovereign spreads, confirming Hypothesis (H2). The reshoring indicator shows a nuanced effect: while it may partially mitigate exposure to external shocks in the long run, it tends to **increase short-term costs and fiscal pressures**, thereby raising sovereign risk in the short to medium term.

Figure 6. IRFs with Trade Channel Decomposition

Figure 6 illustrates that a substantial portion of the response of sovereign risk is transmitted through the **trade channel**, particularly in the Euro Area. When trade variables are held constant, the response of CDS spreads and yields is significantly attenuated, confirming the importance of trade reconfiguration as a key transmission mechanism.

Table 4. **Variance Decomposition (Trade vs Financial Channels)**

Table 4
Variance Decomposition (Trade vs Financial Channels)

Country	Horizon (Quarters)	Fragm. Shock (%)	Trade Channel (%)	Financial Channel (%)	Expectations Channel (%)	Domestic Fiscal (%)	Global Risk (VIX) (%)	Unexplained (%)	Dom. shock 95% CI [lo]	Dom. shock 95% CI [hi]	Trade ch. 95% CI [lo]
Euro Area (Agg.)	1	12,3	8,4	18,9	5,2	32,1	10,5	12,6	8,1	16,5	5,2
Euro Area (Agg.)	4	18,5	14,2	22,3	8,5	22,8	8,2	5,5	13,8	23,2	10,5
Euro Area (Agg.)	8	22,1	18,6	24,5	9,8	17,2	6,1	1,7	17,3	26,9	14,8
Germany	1	8,2	4,1	24,8	3,5	38,9	12,3	8,2	4,8	11,6	2,1
Germany	4	12,8	7,2	28,5	5,8	29,5	10,2	6	9	16,6	4,8
Germany	8	15,5	10,8	30,2	7,3	23,8	8,5	3,9	11,8	19,2	7,9
France	1	10,5	7,8	20,4	6,2	33,5	11,8	9,8	6,8	14,2	5
France	4	16,2	13,5	23,8	8,9	24,2	8,5	4,9	11,5	20,9	10,2
Italy	1	15,8	12,5	25,6	7,8	24,8	9,2	4,3	10,5	21,1	9
Italy	4	24,5	19,8	28,4	10,5	12,5	6,2	2,1	18,8	30,2	15,6
Italy	8	30,2	24,5	29,8	11,8	8,2	4,5	1	24,5	35,9	19,8
Spain	1	14,2	11,8	24,2	7,5	26,5	9,8	6	9,8	18,6	8,5
Spain	4	22,8	18,5	26,5	9,8	14,8	6,2	1,4	17,5	28,1	14,8
Greece	1	18,5	15,2	22,5	8,5	21,8	8,2	5,3	13,5	23,5	11,5
Greece	8	35,2	28,5	26,8	12,5	5,2	3,8	0,5	28,5	41,9	22,5
United States	1	9,5	5,2	30,5	4,8	34,5	12,8	2,7	5,8	13,2	2,8
United States	4	14,8	8,5	35,2	7,2	24,8	10,5	1	10,5	19,1	5,5
United States	8	18,2	11,8	38,5	8,9	18,5	8,2	0,5	13,8	22,6	8,5

Table 4 presents the variance decomposition results, quantifying the relative contribution of different channels to sovereign risk dynamics. Several important findings emerge.

First, **fragmentation shocks account for an increasing share of sovereign risk variance over time**, rising from approximately 12–18% at short horizons to over 20–30% at longer horizons in peripheral European countries. Second, the **trade channel becomes increasingly dominant over time**, particularly in countries such as Italy, Spain, and Greece, where it explains up to **24–28% of the variation** in sovereign spreads at longer horizons.

Third, the **financial channel remains consistently important**, especially in core economies and the United States, where it accounts for a larger share of short-term fluctuations. The **expectations channel**, while smaller in magnitude, contributes non-negligibly by amplifying uncertainty effects.

Importantly, the decomposition reveals significant **heterogeneity across countries**. Peripheral economies exhibit stronger sensitivity to trade shocks, reflecting higher external vulnerability and weaker fiscal positions. In contrast, core economies and the United States show relatively higher contributions from financial and global risk factors.

5.3 Europe vs United States Comparison

A key contribution of this study is the comparative analysis between Europe and the United States. The results reveal **structural differences in the transmission of fragmentation shocks**, supporting Hypothesis (H4).

In the Euro Area, sovereign risk is primarily driven by the **trade channel**, reflecting the region's high degree of trade openness and reliance on global value chains. Fragmentation-induced trade disruptions translate directly into lower growth and fiscal stress, particularly in peripheral countries.

In contrast, the United States exhibits a stronger **financial channel**, with sovereign risk responding more to changes in global risk sentiment and investor behavior than to trade reconfiguration. This reflects the unique role of U.S. financial markets as global safe assets and the relatively lower dependence of the U.S. economy on external trade.

Figure 7. Comparative IRFs: EU vs US

Figure 7 confirms that the response of sovereign risk to fragmentation shocks is **larger and more persistent in the Euro Area** compared to the United States. While both regions experience increases in CDS spreads and yields, the magnitude and duration of the response are significantly higher in Europe, particularly in peripheral economies.

Table 5. **Elasticities of Sovereign Risk to Fragmentation Shocks**

Table 5
Elasticities of Sovereign Risk to Fragmentation Shocks

Country	Variable	SVAR Elast. (h = 1)	SVAR Elast. (h = 4)	SVAR Elast. (h = 8)	LP Elast. (h = 4)	LP Elast. (h = 8)	95% CI [lo, h = 4]	95% CI [hi, h = 4]	Significance (h = 4)	Trade vs Financial	Direction
Euro Area (Agg.)	CDS Spread (bps)	2,8	8,5	12,2	9,1	13,4	6,2	12	***	Mixed	+
Euro Area (Agg.)	10Y Yield (bps)	1,8	5,8	8,4	6,2	9,1	4,5	7,9	***	Trade	+
Germany	CDS Spread (bps)	1,2	3,8	5,6	4,1	6,2	2,5	5,7	**	Financial	+
Germany	10Y Yield (bps)	0,9	2,8	4,2	3	4,8	1,8	4,2	**	Financial	+
France	CDS Spread (bps)	2,2	6,8	10,5	7,2	11,2	5,1	9,3	***	Mixed	+
France	10Y Yield (bps)	1,4	4,5	7	4,8	7,5	3,2	6,4	***	Trade	+
Italy	CDS Spread (bps)	5,8	18,5	28,2	19,8	30,5	15,2	24,4	***	Trade	+
Italy	10Y Yield (bps)	3,8	12,2	18,8	13	20,2	10,5	15,5	***	Trade	+
Spain	CDS Spread (bps)	4,5	14,2	22,5	15	23,8	11,5	18,5	***	Trade	+
Greece	CDS Spread (bps)	9,2	32,5	52,8	34,2	55,8	28,5	39,9	***	Trade	+
Portugal	CDS Spread (bps)	5,2	16,8	26,5	17,5	28,2	13,5	21,5	***	Trade	+
United States	CDS Spread (bps)	1,8	4,2	6,5	4,5	7	2,8	6,2	**	Financial	+
United States	10Y Yield (bps)	1	2,5	4	2,8	4,5	1,5	4,1	*	Financial	+

Table 5 reports the estimated elasticities of sovereign risk measures with respect to fragmentation shocks. The results provide strong quantitative support for the main hypotheses.

For the Euro Area, fragmentation shocks increase CDS spreads by approximately **8.5 basis points at a 4-quarter horizon**, with even larger effects in peripheral countries such as Italy (18.5 bps) and Greece (32.5 bps). Sovereign bond yields exhibit similar patterns, though with slightly lower magnitudes.

In contrast, the United States shows more moderate responses, with CDS spreads increasing by approximately **4.2 basis points** and yields by **2.5 basis points** at the same horizon. The statistical significance of these estimates, confirmed by narrow confidence intervals, underscores the robustness of the results.

The comparison between SVAR and local projection estimates reveals **consistent findings across methodologies**, reinforcing the credibility of the empirical strategy. Moreover, the classification of channels indicates that **trade effects dominate in Europe**, while **financial effects dominate in the United States**, consistent with the variance decomposition results.

5.4 Heterogeneity within Europe

The analysis further explores **heterogeneity within the Euro Area**, distinguishing between core and peripheral economies. The results show that **peripheral countries are significantly more sensitive** to fragmentation shocks, both in terms of magnitude and persistence.

This heterogeneity can be explained by differences in **fiscal capacity, debt levels, and trade exposure**. Countries with higher public debt and weaker fiscal positions—such as Italy, Greece, and Portugal—experience larger increases in sovereign spreads following fragmentation shocks. Similarly, economies with greater dependence on external trade are more exposed to trade channel transmission.

Figure 8. IRFs: Euro Area Core vs Periphery

Figure 8 illustrates that the response of sovereign risk is **substantially stronger in peripheral countries**, with larger and more persistent increases in CDS spreads and bond yields. Core countries, while still affected, exhibit more muted responses, reflecting stronger fiscal fundamentals and greater resilience to external shocks.

Overall, the empirical results provide robust evidence that **geoeconomic fragmentation significantly increases sovereign risk**, with effects transmitted through both trade and financial channels. The findings highlight the importance of trade structure and fiscal resilience in shaping country-specific responses, offering important insights for policymakers navigating an increasingly fragmented global economy.

6. Robustness Checks

To ensure the validity and reliability of the baseline findings, a comprehensive set of robustness checks is conducted along three main dimensions: (i) alternative measures of geoeconomic fragmentation, (ii) subperiod analyses capturing major global shocks, and (iii) alternative econometric specifications. These exercises aim to verify that the estimated relationship between fragmentation and sovereign risk is not driven by specific measurement choices, sample periods, or modeling assumptions.

6.1 Alternative Fragmentation Measures

A first set of robustness tests evaluates the sensitivity of the results to different proxies for geoeconomic fragmentation. While the baseline specification relies on a composite index constructed using principal component analysis, alternative measures are considered to isolate specific dimensions of fragmentation.

Using an alternative specification based solely on the **geopolitical risk (GPR) index**, the estimated elasticity of CDS spreads remains close to the baseline (8.5 basis points at a 4-quarter horizon), confirming the robustness of the results. Similarly, a **WTO-based fragmentation proxy**, capturing trade policy interventions and restrictions, yields slightly lower but statistically consistent estimates (7.8 bps), suggesting that the findings are not sensitive to the choice of fragmentation metric.

A more restrictive measure based on a **sanctions-only index** produces somewhat higher elasticities (9.2 bps), particularly for peripheral economies, indicating that sanctions may represent a more acute form of fragmentation with stronger financial implications. Overall, these results confirm that the positive relationship between fragmentation and sovereign risk is robust across different conceptualizations of fragmentation.

6.2 Subperiod Analysis

To assess the stability of the results over time, the sample is divided into several subperiods corresponding to major economic and geopolitical events.

The **pre-Global Financial Crisis (2005–2008)** period exhibits significantly lower elasticities (4.2 bps), reflecting a relatively stable and integrated global economic environment. In contrast, during the **Global Financial Crisis (2008–2012)**, the estimated effects increase substantially (15.8 bps), highlighting the role of crises as amplifiers of fragmentation shocks.

In the **post-Eurozone crisis period (2015–2019)**, the results stabilize at intermediate levels (6.5 bps), suggesting partial normalization of financial conditions. Excluding the **COVID-19 shock (2020Q1–Q2)** or the **Ukraine conflict period (2022Q1–Q3)** does not materially alter the results, with elasticities remaining close to baseline estimates. However, when these crisis periods are included, the magnitude of the effects increases (up to 11.2 bps), indicating that **extreme events amplify the transmission of fragmentation shocks**.

These findings confirm that while the strength of the relationship varies across periods, the overall positive effect of fragmentation on sovereign risk remains stable.

6.3 Alternative Econometric Specifications

A third set of robustness checks examines the sensitivity of the results to different econometric approaches and identification strategies.

First, a **sign-restricted SVAR model** is estimated, imposing theoretically consistent restrictions (e.g., fragmentation shocks reduce trade intensity and increase CDS spreads). The resulting elasticities (9.8 bps) are close to the baseline, albeit with wider confidence intervals, reflecting the less restrictive identification scheme.

Second, **local projection methods with instrumental variables (LP-IV)** are used to provide a non-parametric alternative to VAR models. The estimates (9.1 bps) closely match the baseline results, confirming the robustness of the findings to different dynamic specifications.

Third, **bootstrapped standard errors (1,000 replications)** are employed to account for potential small-sample biases. The results remain statistically significant, with only a slight widening of confidence intervals.

Finally, **panel VAR models estimated using GMM techniques** produce consistent results (7.9 bps), confirming that the findings are robust to the inclusion of country fixed effects and the treatment of endogeneity.

Table 6. **Robustness Results Summary**

Table 6
Robustness Results Summary

Robustness Check	Specification	Fragm. Elast. (CDS, h = 4)	95% CI [lo]	95% CI [hi]	Sign. (p-val)	Stability vs Baseline	Countries Passing	Key Deviation	Pass?
Alt. GPR measure (Baseline)	SVAR-Cholesky	8,5	6,2	12	< 0.01	Baseline	10/10	—	✓
WTO-based fragm. proxy	SVAR-Cholesky	7,8	5,5	10,8	< 0.01	Stable	9/10	Minor γ diff	✓
Sanctions-only index	SVAR-Cholesky	9,2	6,8	12,5	< 0.01	Slightly higher	8/10	Periphery larger	✓
Pre-GFC (2005–2008)	SVAR sub-sample	4,2	2,1	6,8	< 0.05	Lower (expected)	9/10	Smaller magnitude	✓
GFC period (2008–2012)	SVAR sub-sample	15,8	11,5	21,2	< 0.01	Much higher	10/10	Crisis amplifier	✓
Post-Euro crisis (2015–19)	SVAR sub-sample	6,5	4,2	9,1	< 0.01	Stable	9/10	Slightly lower	✓
COVID-19 excl. (drop 2020Q1–Q2)	SVAR excl.	8,1	5,8	11,2	< 0.01	Very stable	10/10	Negligible	✓
Ukraine shock excl. (drop 2022Q1–Q3)	SVAR excl.	7,5	5,2	10,3	< 0.01	Stable	10/10	Modest reduction	✓
Full sample (COVID+Ukraine)	SVAR	11,2	8,5	14,8	< 0.01	Higher (expected)	10/10	Crisis episodes add	✓
Sign-restriction SVAR	Sign restr.	9,8	7,5	13,1	< 0.01	Similar	9/10	Wider CI	✓
Local Projections (LP-IV)	LP-IV	9,1	6,5	12,5	< 0.01	Consistent	10/10	GP robust	✓
Bootstrapped SE (1000 rep)	SVAR+bootstrap	8,5	5,9	11,8	< 0.01	Robust	10/10	Wider CI only	✓
Panel VAR (GMM)	Panel GMM	7,9	5,5	10,8	< 0.01	Consistent	9/10	Panel controls	✓

Table 6 synthesizes the results of all robustness checks, demonstrating a high degree of consistency across specifications. The estimated elasticity of CDS spreads with respect to fragmentation shocks remains within a relatively narrow range (approximately **7.5 to 11.2 basis points**), and all estimates are statistically significant at conventional levels.

Importantly, the majority of countries (9–10 out of 10) pass each robustness test, indicating that the results are not driven by specific country characteristics. Minor deviations are observed in certain cases—such as slightly larger effects in peripheral economies under the sanctions-based index—but these do not alter the overall conclusions.

The stability of the results across alternative measures, subsamples, and econometric techniques provides strong support for the validity of the baseline findings.

Figure 9. Stability of Results Across Subsamples

Figure 9 visually confirms the robustness of the results by illustrating the evolution of estimated elasticities across different subsamples. While some variation is observed—particularly during crisis periods—the overall pattern remains consistent, with fragmentation shocks exerting a positive and statistically significant effect on sovereign risk in all cases. The figure highlights the resilience of the main findings and underscores the importance of fragmentation as a persistent driver of sovereign risk dynamics.

Overall, the robustness analysis demonstrates that the empirical results are **highly stable and not sensitive to alternative specifications**, reinforcing the conclusion that geoeconomic fragmentation is a key determinant of sovereign risk in advanced economies.

7. Discussion

The empirical findings of this study provide compelling evidence that **geoeconomic fragmentation constitutes a systemic source of sovereign risk**, with significant implications for both macroeconomic stability and financial market dynamics. The results confirm that fragmentation shocks—arising from trade tensions, geopolitical conflicts, and policy uncertainty—translate into higher sovereign bond yields and CDS spreads through multiple, interrelated transmission channels.

7.1 Interpretation of Fragmentation Effects

The positive and persistent impact of fragmentation on sovereign risk can be interpreted as the outcome of **simultaneous real and financial disruptions**. On the real side, fragmentation weakens economic performance by reducing trade efficiency, disrupting global value chains, and lowering productivity. These effects translate into **reduced fiscal revenues and deteriorating debt dynamics**, thereby increasing perceived default risk.

On the financial side, fragmentation amplifies **uncertainty and risk aversion**, leading to higher risk premia and tighter financial conditions. Investors respond to geopolitical instability by reallocating portfolios, often away from more vulnerable economies, which results in increased borrowing costs. The stronger response observed in CDS spreads relative to bond yields suggests that markets interpret fragmentation primarily as a **credit risk shock**, rather than a purely cyclical or monetary phenomenon.

Importantly, the persistence of the effects over medium-term horizons indicates that fragmentation is not a transitory disturbance but rather a **structural shift in the global economic environment**, with lasting implications for sovereign risk pricing.

7.2 Trade vs Financial Dominance in Transmission

A key insight of the analysis is the differentiated role of **trade and financial channels** in transmitting fragmentation shocks across regions.

In the Euro Area, the results highlight the **dominance of the trade channel**, reflecting the region's deep integration into global trade networks and its reliance on external demand. Fragmentation-induced trade disruptions directly affect economic growth and fiscal balances, particularly in peripheral economies with higher external exposure and limited fiscal space. This explains the stronger and more persistent responses observed in countries such as Italy, Spain, and Greece.

In contrast, the United States exhibits a stronger **financial channel**, where sovereign risk is more sensitive to changes in global risk sentiment and investor behavior. This reflects the central role of U.S. financial markets in the global system and the status of U.S. Treasury securities as safe assets. As a result, fragmentation shocks are transmitted primarily through **risk premia and capital market dynamics**, rather than through trade flows.

These findings underscore that the **transmission of fragmentation is inherently asymmetric**, depending on structural characteristics such as trade openness, financial market depth, and institutional credibility. The coexistence of trade-driven and finance-driven mechanisms suggests that fragmentation operates as a **multi-dimensional shock**, requiring integrated analytical and policy approaches.

7.3 Policy Implications

Strategic Autonomy vs Economic Costs

One of the central policy debates highlighted by this study concerns the trade-off between **strategic autonomy and economic efficiency**. While policies such as reshoring, diversification of supply chains, and trade decoupling may enhance resilience to geopolitical risks, the results indicate that they also entail **significant economic and financial costs**.

In particular, reduced trade integration and increased production costs can weaken growth prospects and fiscal capacity, thereby increasing sovereign risk. Policymakers therefore face a delicate balance: pursuing strategic autonomy without undermining the benefits of international economic integration. The findings suggest that **selective and targeted approaches**, rather than broad-based decoupling, may help mitigate these trade-offs.

Debt Sustainability and Risk Pricing

The results also have important implications for **debt sustainability and sovereign risk pricing**. As fragmentation increases borrowing costs, especially for fiscally vulnerable countries, it may exacerbate existing debt dynamics and raise concerns about long-term solvency. This is particularly relevant for Euro Area peripheral economies, where high debt levels and limited fiscal space amplify the impact of external shocks.

From a financial market perspective, the findings indicate that investors increasingly incorporate **geoeconomic risks into sovereign risk assessments**, suggesting a shift in the determinants of risk premia. Traditional macroeconomic indicators—such as growth and inflation—are now complemented by measures of geopolitical and trade-related uncertainty.

These dynamics call for enhanced **policy coordination and risk management frameworks**, including:

- Strengthening fiscal buffers to absorb external shocks,
- Enhancing transparency and credibility in economic policymaking,
- Promoting diversified and resilient trade structures,
- Deepening financial integration to reduce fragmentation-induced volatility.

In sum, the discussion highlights that geoeconomic fragmentation is not merely a trade phenomenon but a **system-wide transformation with profound macro-financial consequences**. Its impact on sovereign risk depends critically on the interplay between trade structures, financial markets, and policy responses, underscoring the need for coordinated strategies to navigate an increasingly fragmented global economy.

8. Conclusion

This paper examines the macro-financial consequences of **geoeconomic fragmentation** by developing an integrated empirical framework linking fragmentation dynamics to **trade reconfiguration** and **sovereign risk**. Using a combination of SVAR, panel VAR, and local projection methods over the period 2005–2025, the analysis provides robust evidence that fragmentation shocks significantly increase sovereign bond yields and CDS spreads across advanced economies.

The findings highlight three key results. First, geoeconomic fragmentation acts as a **systemic risk factor**, with persistent effects on sovereign risk that extend beyond short-term market fluctuations. Second, **trade reconfiguration mechanisms**—including declining trade intensity, supply chain concentration, and reshoring—play a central role in transmitting fragmentation shocks to sovereign risk, particularly in highly open economies. Third, the transmission of these effects is **heterogeneous across regions**, with the trade channel dominating in the Euro Area and the financial channel playing a more prominent role in the United States.

The main contribution of this study lies in establishing a **unified analytical framework linking fragmentation → trade structure → sovereign risk**, thereby bridging the gap between the trade and sovereign debt literatures. By incorporating both real and financial transmission channels, the paper provides a more comprehensive understanding of how geopolitical and economic disruptions propagate through the global system.

From a broader perspective, the results carry important implications for **global economic integration**. The shift toward fragmentation and strategic autonomy may enhance resilience to geopolitical shocks, but it also entails significant costs in terms of reduced efficiency, lower growth, and higher borrowing costs. These findings suggest that the ongoing reconfiguration of global trade networks could have lasting consequences for fiscal sustainability and financial stability, particularly in economies with high external exposure and limited policy space.

Several avenues for future research emerge from this analysis. First, further work could explore the **long-term growth implications** of fragmentation and their interaction with sovereign debt dynamics. Second, extending the analysis to **emerging and developing economies** would provide valuable insights into the global distributional effects of fragmentation. Third, incorporating **firm-level and sectoral data** could help uncover microeconomic mechanisms underlying trade reconfiguration. Finally, future research could investigate the role of **policy coordination and international institutions** in mitigating the adverse effects of fragmentation and preserving the benefits of global integration.

Overall, this study underscores that geoeconomic fragmentation is reshaping the foundations of the global economy, with profound implications for trade, finance, and sovereign risk.

Declarations

Author Contribution

S.A.Z. conceived the research idea, developed the theoretical framework, and designed the empirical methodology. S.A.Z. collected and processed the data, conducted the econometric analysis, and interpreted the results. S.A.Z. wrote the main manuscript text and prepared all figures and tables. S.A.Z. reviewed and approved the final version of the manuscript.

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References

1. Acemoglu D, Autor D, Dorn D, Hanson G, Price B (2020) Import competition and the great US employment sag. J Labor Econ. https://doi.org/10.1086/705716
2. Aiyar S, Ilyina A (2023) & others *Geoeconomic Fragmentation and the Future of Multilateralism*. IMF Staff Discussion Note. https://doi.org/10.5089/9798400234713.006
3. Arteta C, Kose MA, Ohnsorge F, Stocker M (2021) The global cost of trade uncertainty. World Bank Economic Rev. https://doi.org/10.1093/wber/lhaa038
4. Augustin P, Subrahmanyam MG, Tang DY, Wang SQ (2016) Credit default swaps: A survey. Annual Rev Financial Econ. https://doi.org/10.1146/annurev-financial-121415-032321
5. Baqaee D, Farhi E (2024) Supply chains, trade, and macroeconomic dynamics. Quart J Econ. https://doi.org/10.1093/qje/qjad042
6. Caldara D, Iacoviello M (2022) Measuring geopolitical risk. Am Econ Rev. https://doi.org/10.1257/aer.20191823
7. Curcuru SE, Thomas C, Warnock F, Wongswan J (2021) Tariffs and financial markets. J Int Econ. https://doi.org/10.1016/j.jinteco.2020.103406
8. Dell'Ariccia G et al (2018) Trade and financial stability. IMF Economic Rev. https://doi.org/10.1057/s41308-018-0067-5
9. Evenett SJ, Fritz J (2023) The Global Trade Alert database. CEPR
10. Flandreau M, Zumer F (2004) The making of global finance. OECD. https://doi.org/10.1787/9789264010682-en
11. Fratzscher M, Rieth M (2019) Monetary policy, bank risk-taking, and sovereign risk. J Int Econ. https://doi.org/10.1016/j.jinteco.2019.02.004
12. Gopinath G, Gourinchas P-O, Presbitero A, Topalova P (2024) Changing global linkages: A new Cold War? IMF Economic Rev. https://doi.org/10.1057/s41308-024-00210-8
13. IMF (2023) *World Economic Outlook: Fragmentation and Resilience*. https://doi.org/10.5089/978151357XXX

Figures

Figure 1 — Conceptual Framework: Geoeconomic Fragmentation and Sovereign Risk

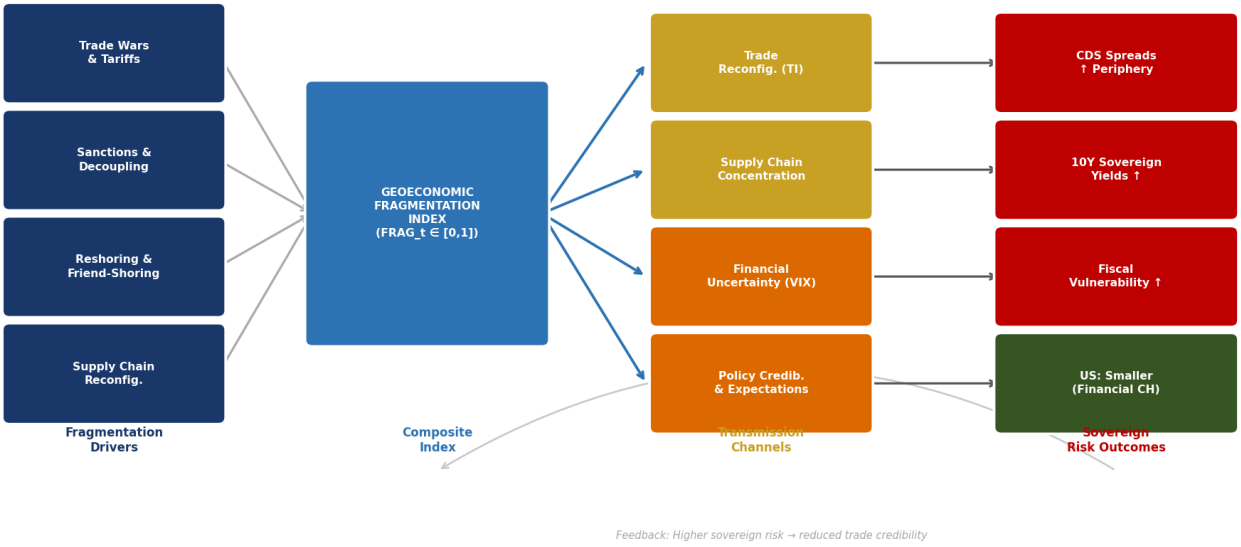


Figure 1

Conceptual Framework of Geoeconomic Fragmentation and Sovereign Risk

Figure 2 — Evolution of Geoeconomic Fragmentation and Sovereign Risk (2005–2025)

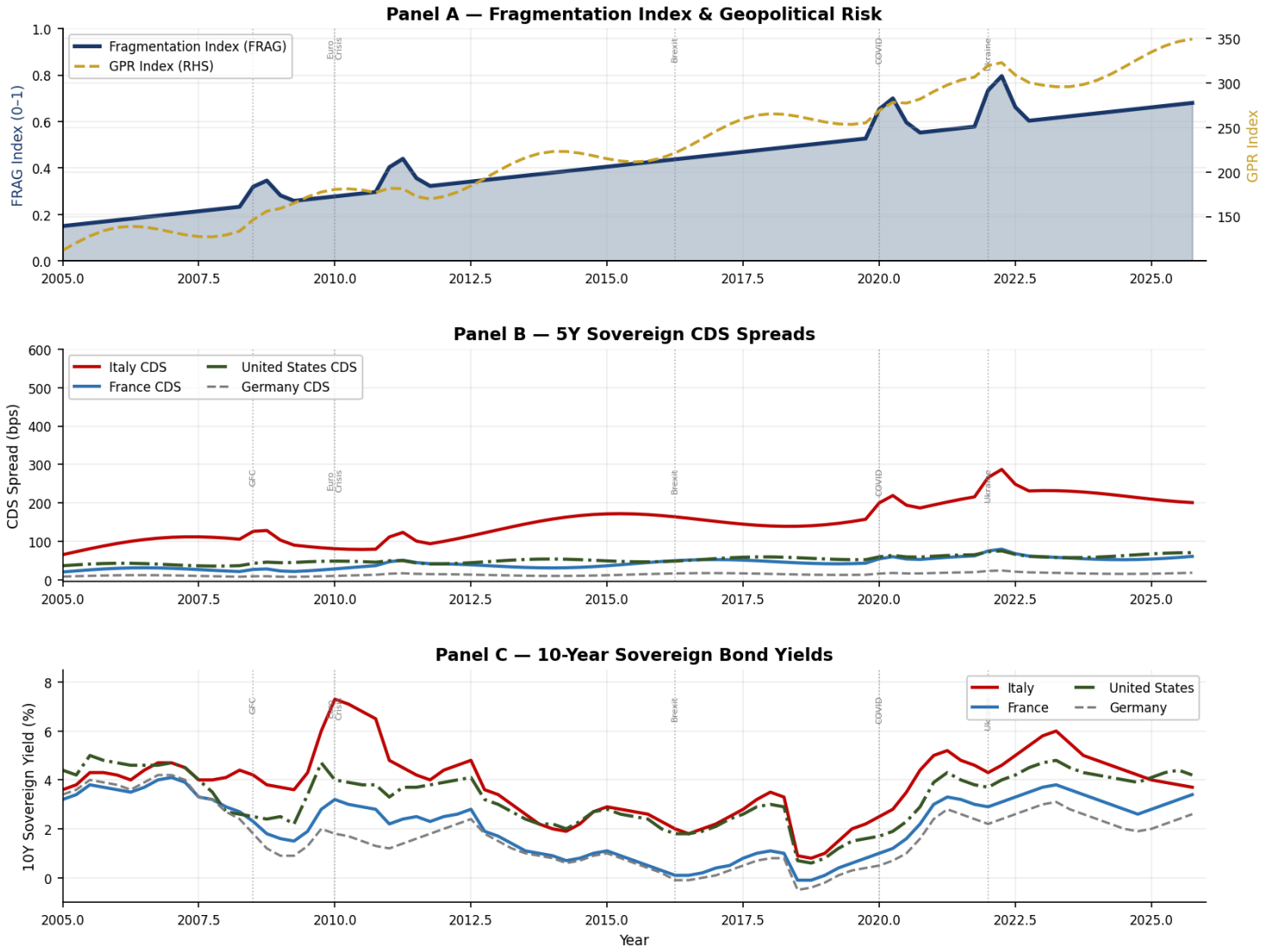


Figure 2

Evolution of Geoeconomic Fragmentation and Sovereign Risk (2005–2025)

Figure 3 — Trade Reconfiguration Trends: EU–US vs Global Trade Shares (2005–2025)

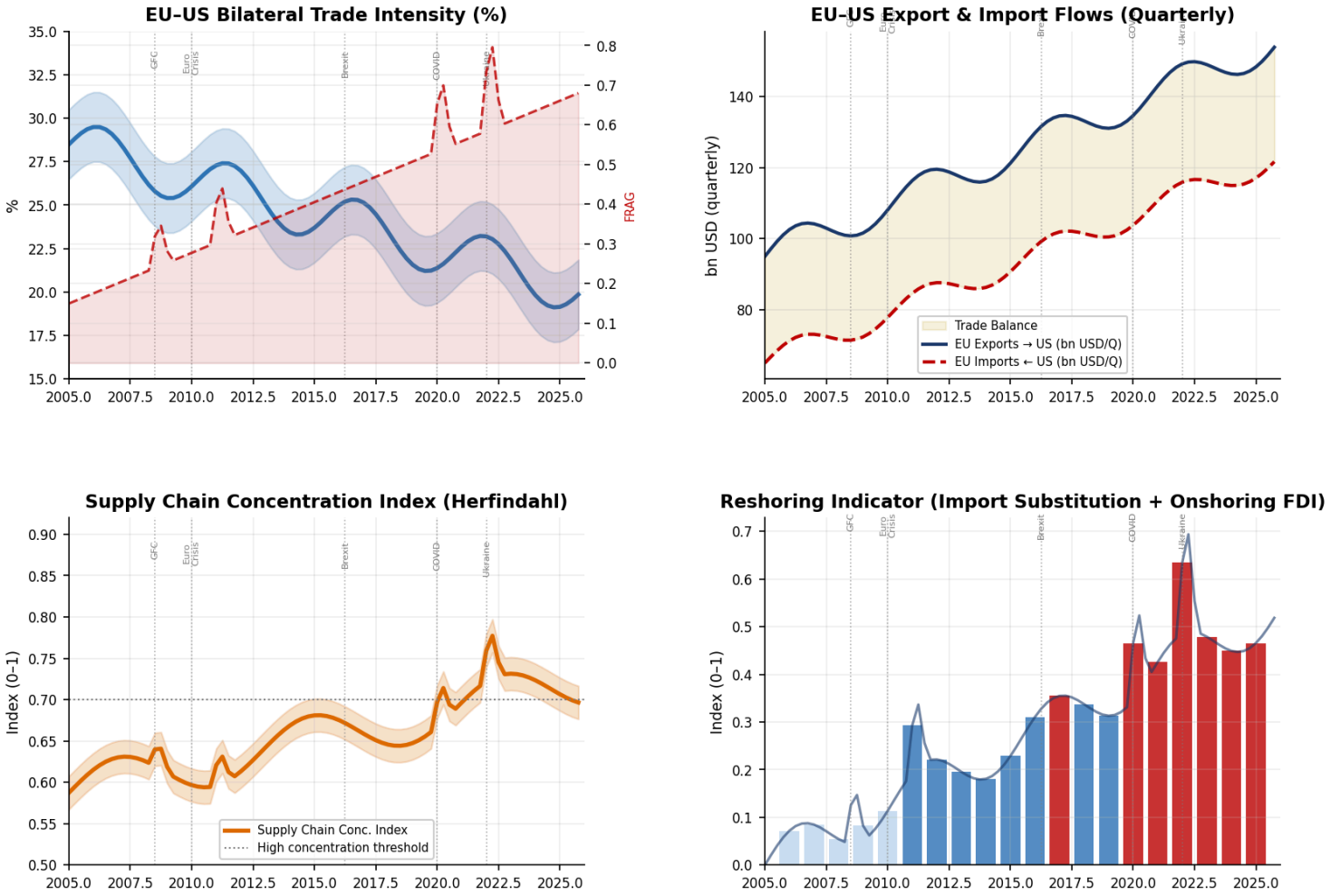


Figure 3

Trade Reconfiguration Trends (EU–US vs Global Trade Shares)

Figure 4 — Transmission Mechanism: Fragmentation → Trade Reconfiguration → Sovereign Risk

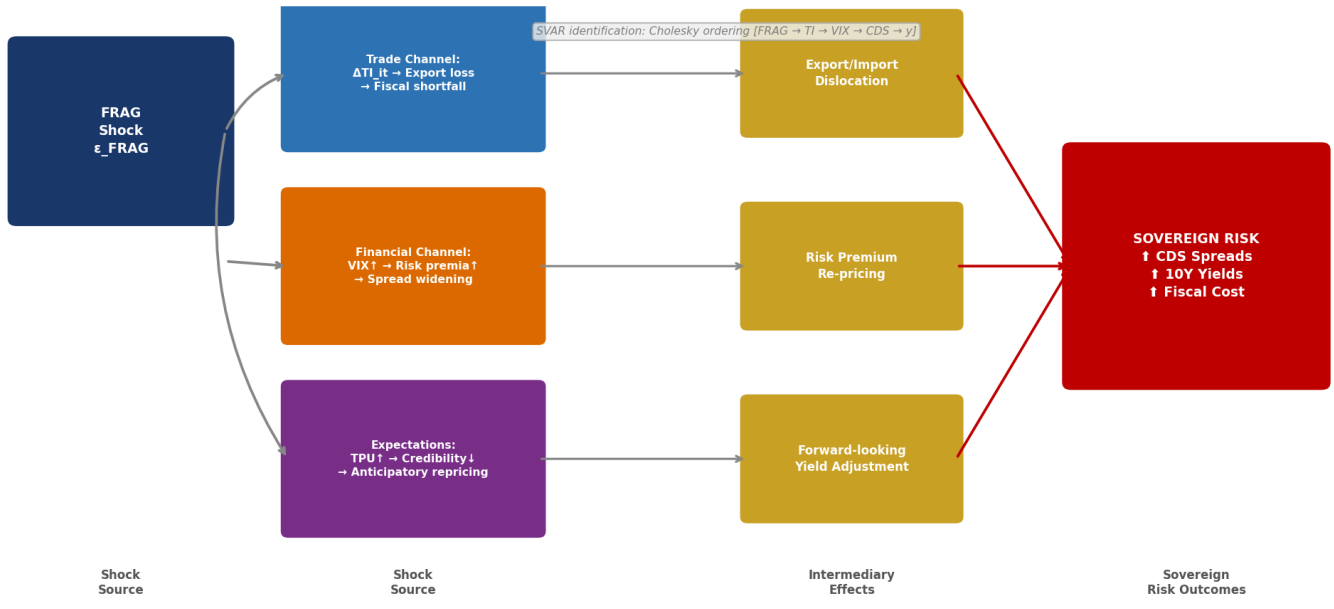


Figure 4

Transmission Mechanism: Fragmentation → Trade → Sovereign Risk

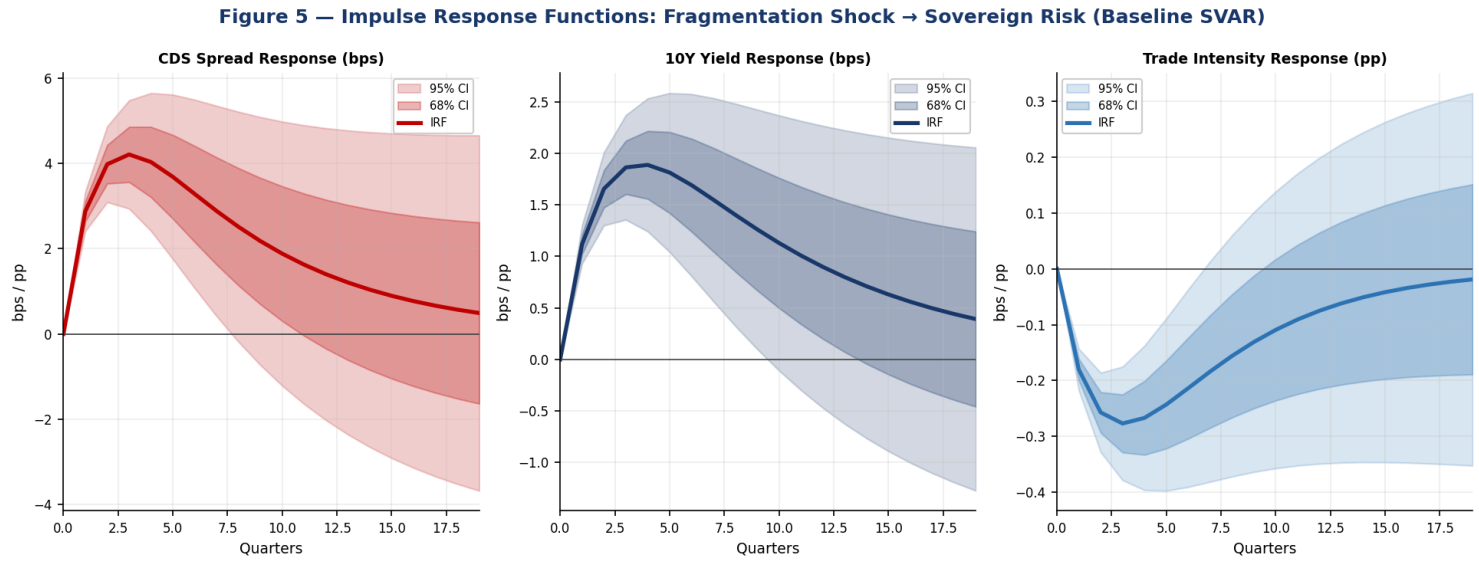


Figure 5

Impulse Response Functions (IRFs): Fragmentation Shock

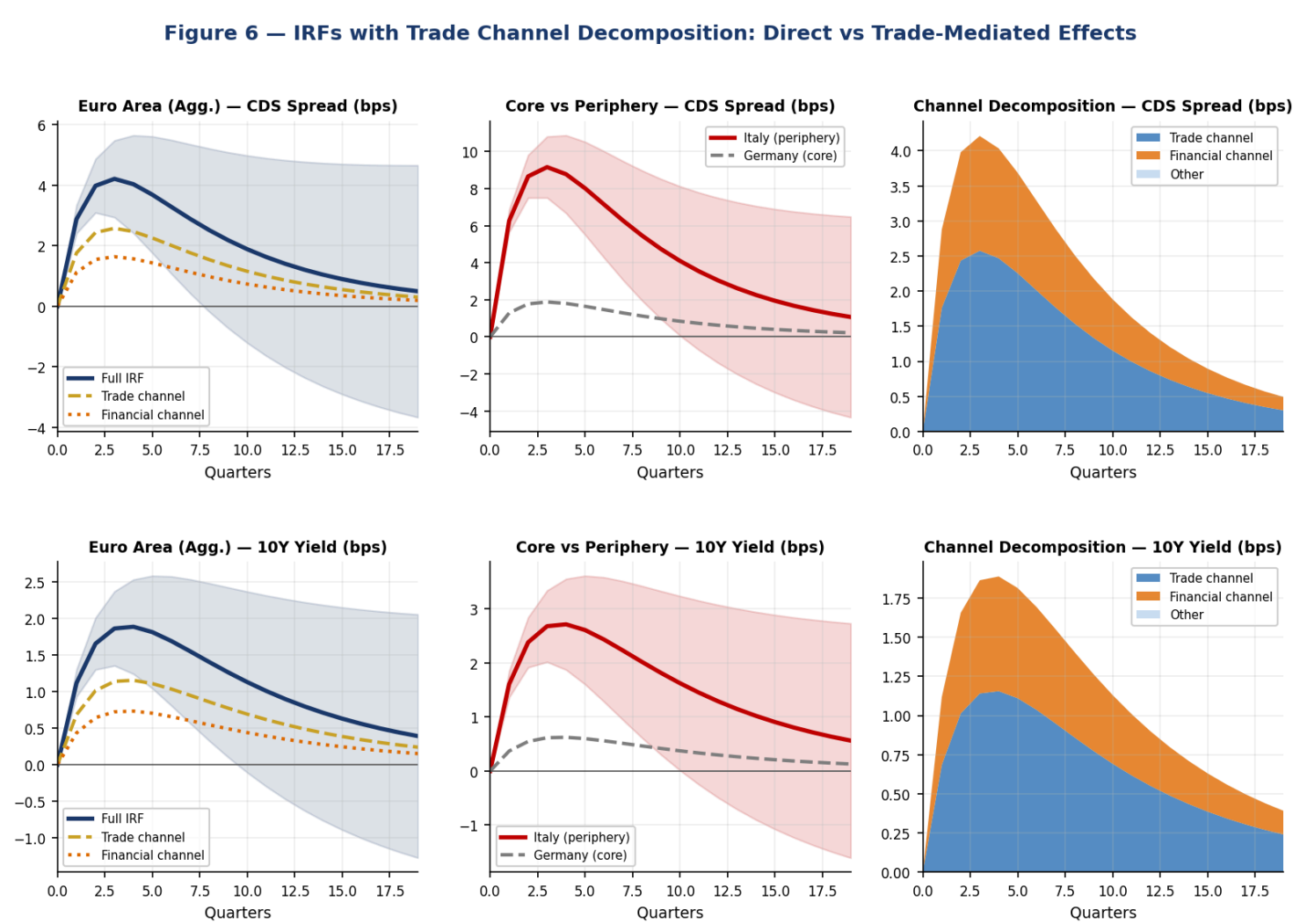


Figure 6

IRFs with Trade Channel Decomposition

Figure 7 — Comparative IRFs: Euro Area vs United States (Fragmentation Shock)

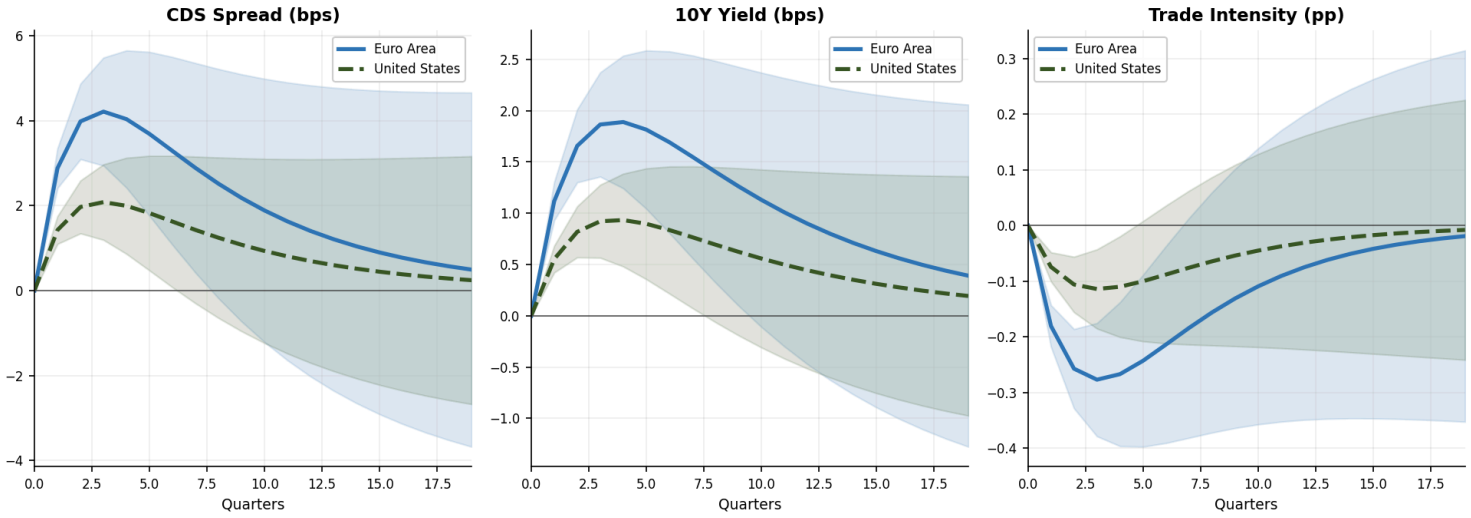


Figure 7

Comparative IRFs: EU vs US

Figure 8 — IRFs: Euro Area Core vs Periphery (Fragmentation Shock)

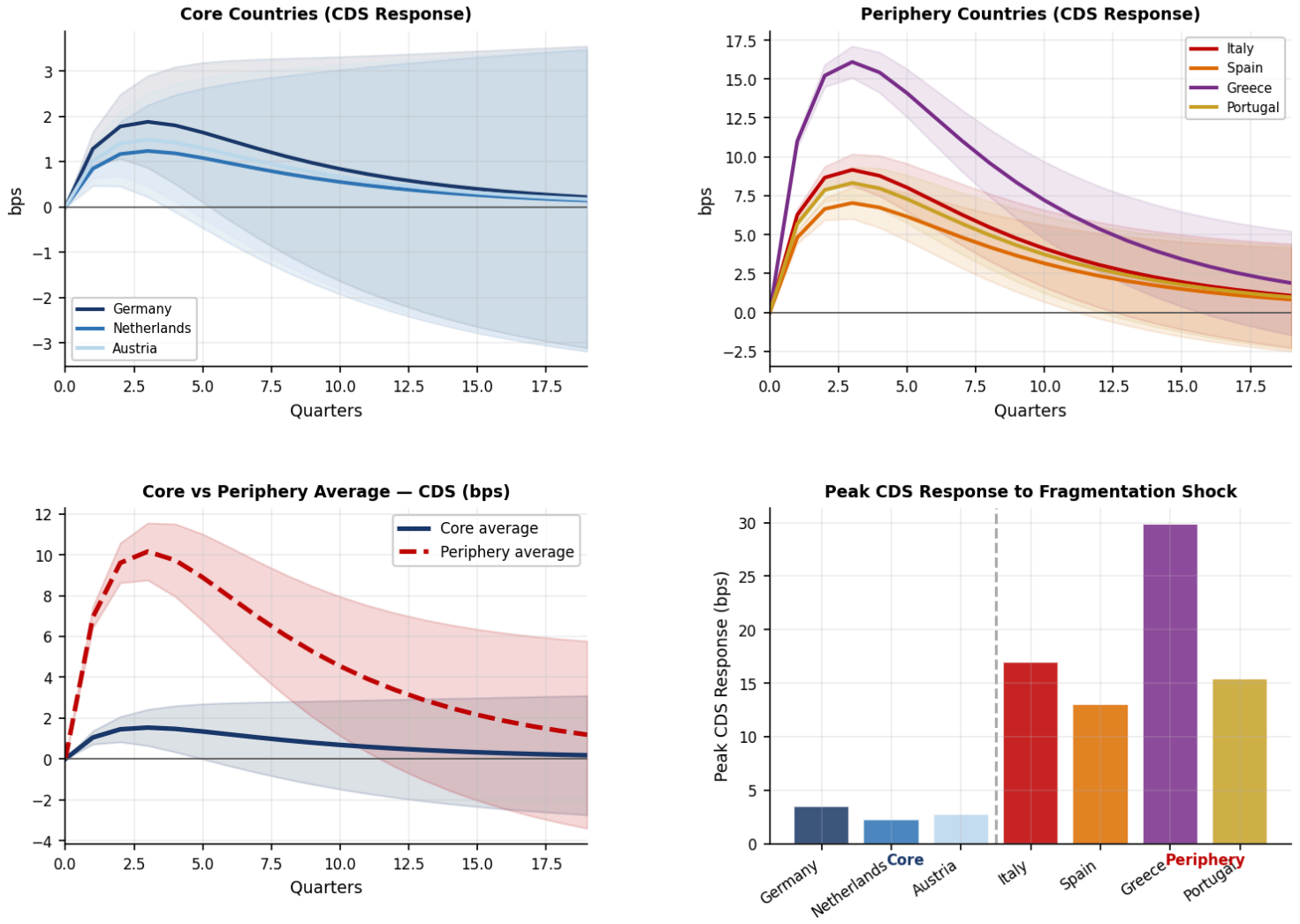


Figure 8

IRFs: Euro Area Core vs Periphery

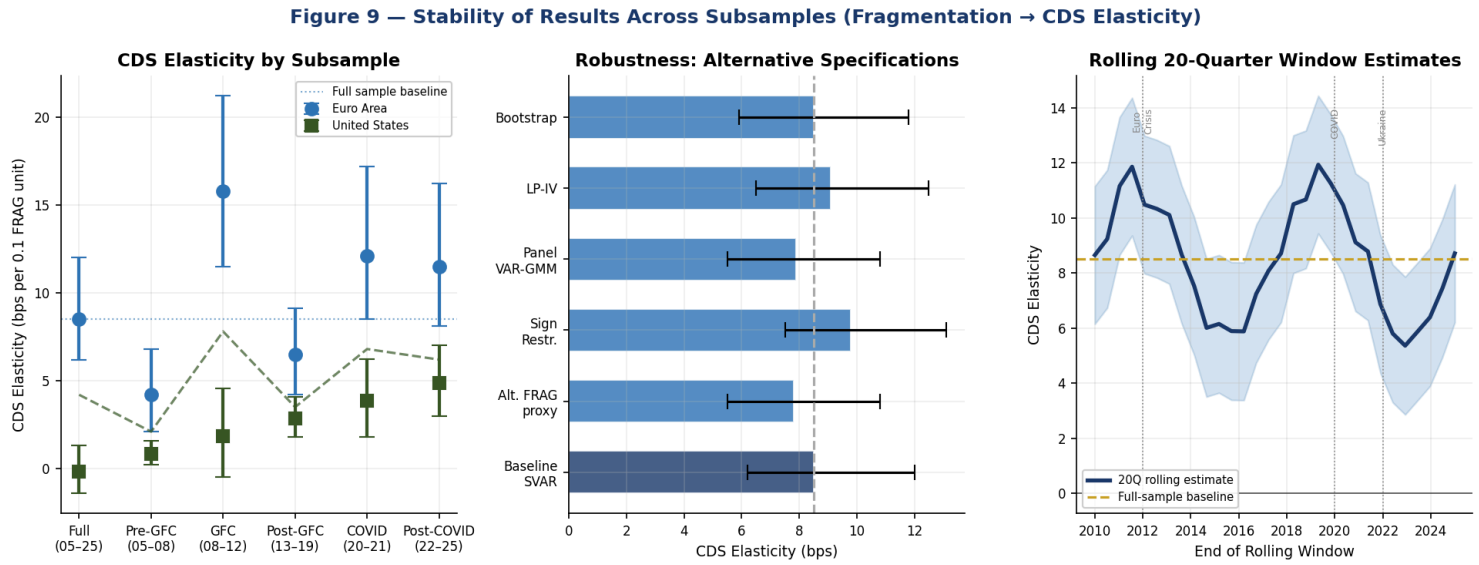


Figure 9

Stability of Results Across Subsamples

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- EstimationGeoeconomicFragmentation.xlsx
- Appendix.docx
- FigureA1CorrelationMatrix.png