

Capital centralization, protectionism and increasing military expenditures: A SVAR/BVAR analysis

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Abstract

This paper formalizes and empirically tests the causal transmission mechanism linking international capital centralization, macro-financial imbalances, protectionism, and systemic military escalation. We challenge the orthodox view of globalization as a self-stabilizing framework for peace, conceptualizing contemporary geoeconomic fragmentation through a theoretical framework stemming from the debate on global imbalances and the analytical revival of the Marxian tendential law of capital centralization. Integrating Structural Vector Autoregression (SVAR) and Bayesian Vector Autoregression (BVAR) models on historical time-series data (1998–2024), we estimate the dynamic interactions between net control, net international investment positions, a protectionism index, and military expenditure metrics across both a bilateral U.S.-China framework and an aggregated creditor-debtor group model. The empirical results confirm a statistically significant multi-stage causal sequence: an increase in capital centralization widens gaps in net international investment positions, prompting debtors to deploy protectionist measures to mitigate further capital centralization. Conversely, these protectionist shocks induce persistent, long-term positive impacts on the military expenditure of creditor states. Econometric evidence demonstrates that trade conflicts and rearmament are endogenous structural symptoms of the systemic motion of capital rather than exogenous diplomatic failures.

Keywords: Capital centralization; Protectionism; Military expenditure; SVAR and BVAR models

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1. Introduction

The global economic order is currently navigating an era of profound instability, marked by mounting tensions between the legacy of trade liberalization and a resurgent geopolitical fragmentation. For decades, the neoclassical consensus maintained that globalization acted as a self-stabilizing mechanism, where market efficiency would naturally lead to a convergence of interests and the gradual mitigation of systemic conflict. Within this framework, the free movement of goods and capital was conceptualized as a “stabilizing” force intended to integrate emerging powers into a Western-led, rules-based international architecture. However, such optimistic teleology has been fundamentally challenged. Instead of a balanced distribution of wealth, the international environment has witnessed a persistent process of capital centralization. This trend underscores a qualitative restructuring of global power dynamics, where a diminishing number of financial and corporate entities govern the movement of capital across sovereign borders.

This shift is rooted in the reconfiguration of trade relationships following China's 2001 WTO entry. In the final three decades of the twentieth century, a progressive opening of international trade – fostered by the joint efforts of Henry Kissinger and Deng Xiaoping to bring China closer to the West – redefined the global commercial landscape. This integration allowed China to transform from a low-cost outsourcing hub into a formidable competitor, evolving its technological paradigm toward high-value-added exports while reducing its dependency on Western components. This industrial ascension has directly eroded the competitive standing of formerly dominant exporters, a transformation most vividly articulated by the structural U.S. trade deficits: though present since 1977, these deficits have evolved into a structural counterpart to the surging surpluses of emerging creditor nations. Such a divergence has polarized the global economy into a “debtor” group led by the U.S. and a “creditor” group led by China. As of 2021, the former held a liability surplus of 18,124 billion dollars, while the latter maintained a surplus of 4,108 billion dollars. A primary outcome of this integration was a marked increase in capital centralization, particularly within the U.S. and China.

The system remained stable only as long as creditors were content to finance debtors via public debt securities. This equilibrium was fundamentally anchored in the aftermath of the 1971 collapse of the Bretton Woods agreements. Following the end of dollar-gold convertibility, the U.S. managed to sustain its global military and political presence by issuing state bonds purchased primarily by Germany and Japan.

The sustainability of this arrangement reached a breaking point when instead of merely recycling trade surpluses into U.S. Treasuries to maintain the status quo, Asian nations – led by China – began utilizing their massive dollar reserves to finance autonomous strategic expansion.

Much like the British Empire's strategy in the early twentieth century (De Cecco, 1974), this model proved unsustainable, reaching a definitive breaking point in the wake of the 2008 financial crisis. This disruption was driven by a shift from passive debt financing to direct capital centralization, as creditors sought controlling stakes in Western corporations within cutting-edge sectors such as the green economy and artificial intelligence. At this juncture, China's transition from a passive creditor to an active geopolitical protagonist, characterized by its ascent in global value chains (Sciortino, 2024), signaled a terminal decline in U.S. commercial competitiveness². This situation has been interpreted as a weakening of U.S. economic hegemony. This has raised urgent concerns regarding national security, as financial interdependence and the expansion of U.S. debt have come to be seen as the main sources of systemic vulnerability.

According to Rodrick (2024), these developments underscored the definitive failure of the prior consensus, which posited that China's economic integration would have inevitably led to Western democratic alignment. An early and significant sign of this discontent can be seen in the systemic protectionist response, characterized by duties and sanctions on the movement of capital and people, implemented primarily by the United States. Brancaccio and Califano (2023) highlight this shift, noting that average tariffs between the U.S. and China surged from minimal levels to roughly 21% by 2019. This defensive pivot, which began with Obama-era financial and student visa restrictions, escalated during the first Trump presidency with the 2019 25% steel tariff. The objective was twofold: to weaken China's production lead and to discourage economic ties between Beijing and Europe. This trend intensified under the Biden

administration through restricted semiconductor exports and the promotion of “friend-shoring”. As Treasury Secretary Janet Yellen (2022) noted, this “de-globalizing” policy limited economic relations to partners sharing Western geopolitical values, reflecting a belief that open trade no longer guaranteed national security.

This protectionist trajectory reached a radical climax in April 2025, when the second Trump administration imposed a baseline 10% tariff on nearly all imports. Utilizing a reciprocity formula designed to force zero bilateral trade balances, the administration framed the move as a deficit-reduction measure; however, the broader strategic aim was to use leverage economic pressure to rebalance power relations in favor of the United States³.

Beyond containing Beijing, the U.S. leveraged protectionist tools to coerce its own allies into alignment, a strategy that placed Europe at a critical crossroads. This internal balance was shattered by the Russia-Ukraine conflict, which effectively dismantled the Central European growth model – a system previously reliant on low-cost Russian energy to fuel high-value exports to China. Forced into a strategic pivot, the EU solidified its energy dependence on Washington in 2023 via a major natural gas agreement with the Biden administration. Yet, the risk of a trans-Atlantic rupture persists as the U.S. fears the formation of a China-led non-aligned bloc⁴.

This transition toward a fragmented global order suggests that persistent Western protectionism has effectively strengthened a nascent, defensive cooperation among Eastern creditors. While major creditors like China publicly advocate for free trade to maintain access to global markets, their internal strategic shifts reveal a fundamental lack of trust in the viability of the globalization project. Ultimately, as the Western-led financial infrastructure is increasingly weaponized through sanctions and tariffs, the Eastern bloc’s massive military buildup serves as the necessary physical architecture to secure its emerging, autonomous economic sphere, solidifying China’s position as a peer competitor to American hegemony.

This expansion of Eastern military capacity directly challenges the foundational structure of American global presence. Despite possessing geographic immunity, the U.S. maintains a disproportionate apparatus of 750 military bases in 80 countries –

contrasted with China's one and Russia's nine. As Streeck (2024) points out, the U.S. is not defending its homeland, but rather its claim to be the world's principal peacekeeper, asserting the unilateral right to define and enforce global order.

In response to this shifting landscape, the United States has initiated a massive strategic pivot aimed at reclaiming absolute military dominance. The fiscal year 2027 budget request, totaling \$1.5 trillion, represents the largest defense request in American history (U.S. Department of War, 2026a). As Secretary of War Pete Hegseth stated, this funding aims to deliver on a commitment to “expand American military dominance for decades to come”, arguing that previous administrations underinvested while “enemies grew stronger and more dangerous” (U.S. Department of War, 2026b). This 42% increase is explicitly designed to supercharge the U.S. defense industrial base, expanding the production of major weapon systems while securing technological advantages in drone dominance and space superiority. Under the doctrine of “peace through strength”, this record-breaking investment allocates approximately 52% of its total funds toward hardware procurement – including munitions, planes, tanks, and ships – while introducing seven-year contracts to stabilize private-sector supply chains and incentivize private investments. Furthermore, the request prioritizes the human component through significant pay increases, intended to maintain a premier fighting force capable of protecting the homeland while projecting power abroad.

Ultimately, as Western financial infrastructure is increasingly weaponized through sanctions and tariffs, this unprecedented American military expansion functions as the decisive counterweight to the Eastern bloc's emerging autonomous economic sphere, solidifying China's position as a peer competitor to American hegemony.

However, the sustainability of this global policing role has necessitated a strategic shifting of the defense burden, particularly within the European theater. Following the “Pivot to Asia” – a foreign policy initiative started by the Obama administration in 2011 to address China's influence – Washington has increasingly pressured Europe to become militarily autonomous to contain Russia, a nation that has solidified its ties with China to an unprecedentedly high level. By 2025, 31 out of 32 NATO members reached the 2% GDP spending threshold. This push aimed to strengthen

NATO's eastern flank without the U.S. bearing the full financial burden, effectively turning a “European army” into a modern version of a foreign legion (Streeck, 2024). In Germany, this transformation is manifest in significant military service reforms. Collectively, these developments highlight a fragile international landscape where the “peace through trade” ideal has been replaced by a logic of rearmament and the formation of rigid strategic blocs.

This shift from market competition to military confrontation is theoretically grounded in the work of Brancaccio and Califano (2023), who identify a direct causal link between protectionist pressures and military escalation. They argue that the war in Ukraine and the use of sanctions must be viewed within the context of a long-term trend—ranging from globalization and the international imbalances it generated to the subsequent “deglobalization” movement—which played a fundamental role in paving the way for the war. The key players in the conflict are more accurately identified as the two blocs of states whose economies are anchored, respectively, to the United States and China—the world’s largest debtor and creditor. In this context, the distinction between sanctions and protectionist policies is becoming increasingly blurred, while both are becoming ever more intertwined with defense policy.

In this context of deepening global fragmentation and conflicts, the aim of this work is to empirically verify whether a causal relationship between capital centralization and military escalation exists. This study moves beyond surface-level politics to examine how deep-seated financial mechanisms transform protectionism and conflict into structural necessities of modern capital centralization.

The rest of the paper is organized into four parts. Section 2 presents the theoretical framework we have developed based on two lines of research: the first concerns the debate on the geopolitical consequences of global imbalances; the second draws on recent research on the tendency toward the centralization of capital in the Marxist sense. In Section 3, we develop an empirical analysis to investigate and formally establish the causal link between the centralization of capital, the resulting intensification of protectionism, and the subsequent military escalation, thereby elevating the debate from purely geopolitical considerations to an analysis of the laws of tendency of capitalism. Section 4 discusses the main results obtained from the SVAR

and BVAR econometric analyses used in the previous section to identify and estimate the causal relationships between the variables. Section 5 concludes.

2. Theoretical Framework

The theoretical foundation of this work is situated within the tradition of critical political economy by drawing on two lines of research. A first part of our framework stems from the debate on the geopolitical consequences of global imbalances. The topic is very broad and has given rise to various interpretations that differ both in terms of the meaning scholars attribute to global imbalances and in terms of the consequences these may have for the global order. Early international political economy and macroeconomic literature debated whether global imbalances were driven by domestic policy distortions in emerging Asia or structural flaws in the American financial architecture. Ben Bernanke (2005) notably argued that the US current account deficit was driven by an “excess savings” in emerging markets, primarily China. Conversely scholars like Barry Eichengreen (2010) asserted that the United States is an active and aggressive borrower rather than a passive consumer of global capital, emphasizing that domestic vulnerabilities—such as low national saving rates and high fiscal deficits—actively drove the U.S. current account deficit. Recent institutional reports from IMF and the World Bank have aligned with scholars like Sébastien Jean and Jean-Pierre Landau (2026) to highlight a new structure imbalance: China’s state-directed credit allocation towards advanced manufacturing. The IMF notes that when systemic economy pursues export-led growth via industrial subsidies while domestic consumption remains depressed, it creates overcapacity, exporting deflationary pressures and intensifying trade frictions with the USA.

Other scholars, associated with the Marxist, post-Keynesian, and world-systems theory schools, reject the mainstream view that imbalances are mere technical or policy errors. Instead, they analyze them as structural features of modern capitalist accumulation architecture. Post-Keynesian economists like Thomas Palley (2015) analyze the USA-China imbalance through the lens of global demand regimes. They argue that neoliberal policies in the USA suppressed domestic wages, forcing the economy to rely on debt-fueled consumption. Simultaneously, China adopted an

aggressive, wage repressing, export-led growth model. Instability is thus caused by a global “race to the bottom” in wages, which creates a chronic deficiency in global aggregate demand. Other Post-Keynesian scholars like Sergio Rossi (2015) argue that the economic tensions and trade imbalances between the United States and China are not caused by currency manipulation or unfair trade practices, but are the inevitable result of an unstable international monetary architecture. They explain that using a national currency (the US dollar) as the world’s primary reserve asset forces structural macro-imbalances upon both nations. Marxist International Political Economy scholars, such as Minqi Li (2016) and David Harvey (2020) view the USA-China dynamic as a symptom of capitalist crisis of over accumulation. China’s immense manufacturing capacity represents a surplus of capital that cannot be absorbed domestically due to low internal consumption. To prevent a domestic collapse, China must export this surplus to the USA, locking both nations in a fragile embrace where any sudden drop in American demand triggers a systemic crisis of profitability in China.

As geopolitical tensions rise, the literature have evolved from evaluating purely macroeconomic risks to assessing the geopolitical risks produced by economic asymmetries. The IMF (2023) warned that splitting the global economy into competing USA and China-centric blocs could cost the global economy up to 7% of GDP, shifting globalization away from multilateralism and toward mercantilist regional blocks.

However, within the debate on global imbalances, no causal chain has been identified that would explain how geopolitical risks are specifically linked to global imbalances themselves. For this reason, we believe it is important to incorporate into our framework the role that the centralization of capital can play, and focus on net foreign positions rather than trade balances as the primary variable for capturing global imbalances. The centralization of capital, initially, is theorized by Karl Marx in *Das Kapital* (1867). as a fundamental law of motion for the capitalist system: a process involving the concentration of already formed capitals, the dissolution of their individual autonomy, and the “expropriation of capitalist by capitalist”, which transforms many small capitals into a few larger ones. In other words, Marx outlined a genuine process of capital centralization that drives the progressive consolidation of formal ownership into the hands of a restricted elite. Through this dynamic, dominant

capitalists gain the ability to govern a quantity of capital far greater than what they formally own. This process can occur directly – through liquidations, acquisitions, or corporate mergers – or indirectly through the fragmentation of ownership; in the case of joint-stock companies, for instance, capital control is concentrated in a few hands, effectively shifting the governance of the corporate network to a small number of entities.

For decades, capital centralization was a central focus of Marxist research, featuring foundational contributions from scholars such as Hilferding (1910), Lenin (1917), and Sweezy (1942). While drawing occasional interest from other schools – notably Schumpeter (1942) and Elliott (1980) – the topic largely remained on the periphery of mainstream academic discourse. However, a recent resurgence of interest has brought these concepts back to the forefront, sparking a contemporary debate where leading mainstream scholars now engage with this perspective (Blanchard and Brancaccio, 2019; Acemoglu and Brancaccio, 2021) and drive new research (Alami and Dixon, 2022).

Spearheading this empirical revival, Brancaccio et al. (2018) provided a detailed analysis of the global ownership network from 2001 to 2016 by employing contemporary network analysis techniques. Their study revealed that while the global network expanded significantly, the evolution was asymmetrical: investors already present in the network increased their interconnections, confirming the existence of a restricted capitalist oligarchy that is difficult to both enter and exit.

To rigorously measure this degree of centralization, Brancaccio et al. (2018) utilized a specific indicator: net control. Developed by Vitali, Glattfelder, and Battiston (2011), net control measures the value of capital governed through both direct and indirect ownership relationships, expressing a concept of integrated ownership often ignored by previous studies. In this framework, a higher net control value indicates a larger number of entities controlling capital, which in turn signifies lower centralization, whereas a lower value reflects a tighter consolidation of power. By expanding upon this methodology, the authors verified long-term trends across a global, inter-sectoral sample of publicly traded companies. Their analysis found that between 2001 and 2016, over 80% of global share capital was controlled by less than 2% of shareholders.

Moreover, 2006 was identified as a watershed year after which the pace of centralization became more systematic, appearing to confirm the Marxian law of tendency toward capital centralization.

Building on these findings, Brancaccio et al. (2022) subsequently tested the universality of this trend to determine whether any national exceptions existed. By expanding their sample to 73 countries accounting for over 95% of global GDP, they found a gradual convergence toward centralization across almost every capitalist economy, regardless of differing institutional structures. This phenomenon proved particularly pronounced in the United States and other Anglo-Saxon nations, where the capitalist structure appeared even more oligarchic than in Russia, suggesting that the drive toward centralization transcends the traditional distinctions between “liberal” and “coordinated” market economies.

While recent scholarship has rigorously mapped the mechanics of global ownership and confirmed the Marxian law of capital centralization, a critical analytical gap remains: to formal verification of a causal link between centralization and military escalation. This study addresses that gap by investigating the military degeneration of capital competition, uncovering the financial mechanisms that make protectionism and conflict a structural necessity of modern centralization.

Framed within this context, the central hypothesis contends that increasing capital centralization, coupled with diverging net international investment positions, triggers a protectionist reaction within debtor nations – the declining powers – followed by a counterreaction from the creditor group. This cycle of escalation drives international tensions toward potential military conflict. To test this, a sophisticated econometric framework utilizing historical time-series data was constructed. This approach moves beyond mere correlation to formally investigate whether the tendential law of capital centralization serves as a quantifiable, systemic cause of war, demonstrating how the financial “expropriation of capitalist by capitalist” eventually manifests as physical confrontation.

3. Empirical Analysis

3.1. Data

The empirical analysis was performed using annual historical series from 1998 to 2024 for a range of variables deemed relevant based on the theoretical framework. A comprehensive list of these variables, including their data sources, is reported in Table 1.

As an indicator of centralization, net control (NC) was used. This is a dimensionless variable ranging from 0 to 1, devised by Vitali, Glattfelder, and Battison (2011), which measures the number of entities controlling capital, serving as an indirect indicator of centralization. Initially, NC was included for individual countries and groups, but a global variant (NC^{WLD}) was later selected for the analysis. It should be noted that the NC data were unavailable for Russia and Iran. Given that the historical series for NC^{WLD} were relatively shorter than others in the model (1998-2019), they were extended to 2024 using a purpose-built index, the Strategic Investment Index (SII), whose construction is reported in Appendix C, through two alternative methods, as detailed in Appendix D: an imputation based on regression ($NCSII$) and a ratio-based extension ($NCSII2$).

The Net International Investment Position ($NIIP$), expressed in U.S. dollars, was used to capture the difference between a country's financial assets and liabilities with respect to non-resident entities. Its series runs from 1998 to 2023.

To quantify the level of protectionism, after several attempts summarized in Appendix E, a Protectionism Index (PI) was developed based on the annual number of sanctions – including military, financial, commercial, and mobility restrictions – introduced by a given country or group of countries in the sample. The series for this index spans from 1998 to 2023.

Military expenditure was analysed through both absolute Military Expenditure (ME) and Military Expenditure Per Capita ($MEPC$), the latter serving to normalize spending based on population size, providing a measure of military spending intensity. Both series, expressed in U.S. dollars, cover the period from 1998 to 2024 and encompass spending on armed forces (including peacekeeping forces), defence ministries, related

government agencies, trained paramilitary forces available for military operations, and military space activities.

Finally, nominal GDP⁵ (*GDP*) in U.S. dollars was included as a proxy for the health of each country's economic system, with the data series extending through 2024.

The sample was strategically constructed to represent the polarization between creditor and debtor nations. Initial model specifications focused on the bilateral dynamics between China and the United States, followed by an expansion to a core group of eight countries. This group was equally divided into a surplus bloc (China, Russia, Saudi Arabia, and Germany) and a deficit bloc (United States, United Kingdom, France, and Australia). For specific robustness checks (Variants 2 and 6), the sample was further extended to include Iran for the creditors and New Zealand for the debtors. The criteria for country selection and data aggregation at a country level are detailed respectively in Appendices A and B.

For a descriptive analysis of the historical series of the variables considered, please refer to Appendix F.

Table 1. List of variables and sources.

Variable	Source
Net Control (<i>NC</i>)	Brancaccio, Giammetti, Loprete and Puliga (2022), “Convergence in Solvency and Capital Centralization: A B-VAR Analysis for High-Income and Euro Area Countries”, <i>Metroeconomica</i> .
Extended Net Control [Regression] (<i>NCSII</i>)	Author’s elaboration.
Extended Net Control [Ratio-based] (<i>NCSII2</i>)	Author’s elaboration.
Net International Investment Position (<i>NIIP</i>)	Milesi-Ferretti, Gian Maria (2024), “The External Wealth of Nations Database”, <i>The Brookings Institution</i> (based on Lane, Philip R. and Gian Maria Milesi-Ferretti (2018), “The External Wealth of Nations Revisited: International Financial Integration in the

	Aftermath of the Global Financial Crisis”, <i>IMF Economic Review</i> 66, 189-222).
Protectionism Index (PI)	Felbermayr, G., A. Kirilakha, C. Syropoulos, E. Yalcin, and Y. V. Yotov (2020), “The Global Sanctions Data Base”, <i>European Economic Review</i> , Volume 129. Yalcin, E., G. Felbermayr, H. Kariem, A. Kirilakha, O. Kwon, C. Syropoulos, and Y. V. Yotov (2025), “The Global Sanctions Data Base - Release 4: The Heterogeneous Effects of the Sanctions on Russia”, <i>The World Economy</i> .
Military Expenditure (ME)	SIPRI (2025), <i>Military Expenditure Database</i> .
Military Expenditure Per Capita (MEPC)	SIPRI (2025), <i>Military Expenditure Database</i> . United Nations, Department of Economic and Social Affairs, Population Division (2024), <i>World Population Prospects: The 2024 Revision</i> .
Nominal GDP (GDP)	FRED (<i>Federal Reserve Economic Data</i>). World Bank, WITS (<i>World Integrated Trade Solution</i>): <i>GDP per capita By Country, in current US\$ 1988-2022</i> .

Source: author's elaboration.

3.2. Methodology

The econometric analysis was conducted in Gretl using data transformed into natural logarithms. As all original series values were strictly positive and well above zero, the logarithmic transformation was executed without data loss or exclusion.

To ensure robust causal inference, a dual-modelling strategy was adopted, utilizing both Structural Vector Autoregression (SVAR) and Bayesian Vector Autoregression (BVAR) models.

Following Kilian & Lütkepohl⁶ (2016), all models were estimated in levels (i.e., on the undifferentiated logarithmic series). This methodological choice aligns with established literature favouring the levels specification in VAR analysis, as it

simultaneously obviates the unit root issue and removes the computational difficulty of imposing specific cointegration restrictions.

Within this framework, SVAR models were used to identify and estimate the causal relationships between the variables by isolating structural shocks. The SVAR analysis was preceded by the estimation of reduced-form VAR models, applied to individual countries (China and the United States) and aggregated blocs (Creditors and Debtors). The reduced-form specification is defined as:

$$y_t = \mu_t + A_1 y_{t-1} + A_2 y_{t-2} + u_t \quad (1)$$

where μ_t is a vector of unconstrained constants, A_1 and A_2 are the $k \times k$ matrices of the reduced-form coefficients, y_{t-1} and y_{t-2} are the $k \times 1$ vectors respectively for the first and second lags of the variables and u_t is a $k \times 1$ vector of error terms.

Each model specification was distinguished solely by the specific variables used as y_t :

$$\text{Model 1: } y_t = \begin{bmatrix} l_{NC}_t^i \\ l_{NIIP}_t^i \\ l_{PI}_t^j \\ l_{ME}_t^i \\ l_{GDP}_t^i \end{bmatrix} \quad (2)$$

$$\text{Model 2: } y_t = \begin{bmatrix} l_{NC}_t^{WLD} \\ l_{NIIP}_t^i \\ l_{PI}_t^j \\ l_{ME}_t^i \\ l_{GDP}_t^i \end{bmatrix} \quad (3)$$

$$\text{Model 3: } y_t = \begin{bmatrix} l_{NCSII}_t^{WLD} \\ l_{NIIP}_t^i \\ l_{PI}_t^j \\ l_{ME}_t^i \\ l_{GDP}_t^i \end{bmatrix} \quad (4)$$

$$\text{Model 4: } y_t = \begin{bmatrix} l_{NCSII2}_t^{WLD} \\ l_{NIIP}_t^i \\ l_{PI}_t^j \\ l_{ME}_t^i \\ l_{GDP}_t^i \end{bmatrix} \quad (5)$$

$$Model\ 5: y_t = \begin{bmatrix} l_NC_t^{WLD} \\ l_NIIP_t^i \\ l_PI_t^j \\ l_MEPC_t^i \\ l_GDP_t^i \end{bmatrix} \quad (6)$$

$$Model\ 6: y_t = \begin{bmatrix} l_NCSII_t^{WLD} \\ l_NIIP_t^i \\ l_PI_t^j \\ l_MEPC_t^i \\ l_GDP_t^i \end{bmatrix} \quad (7)$$

where: if i = China, then j = United States, and if i = creditors, then j = debtors. For models 2 and 6, two variants were implemented: a) 4 countries per group, and b) 5 countries per group.

A consistent VAR(2) structure was adopted for all specifications, determined by minimizing the Akaike (AIC), Bayesian (BIC), and Hannan-Quinn (HQC) information criteria. Estimations used heteroscedasticity-robust standard errors (HC1) with no variables set as exogenous.

To identify structural shocks, the model was transformed into its structural form by making the following substitutions: $A_1 = B_0^{-1}B_1$, $A_2 = B_0^{-1}B_2$ and $u_t = B_0^{-1}\omega_t$:

$$B_0 y_t = \mu_t + B_1 y_{t-1} + B_2 y_{t-2} + \omega_t \quad (8)$$

where B_0 is the non-singular $k \times k$ matrix of contemporaneous coefficients, μ_t is a vector of unconstrained constants, B_1 and B_2 are the $k \times k$ matrices of autoregressive slope coefficients, y_{t-1} and y_{t-2} are the $k \times 1$ vectors respectively of the first and second lags of the variables and ω_t is the $k \times 1$ vector of the structural innovation.

Identification was achieved via a recursive Cholesky decomposition (Kilian & Lütkepohl, 2017), imposing restrictions on matrix B_0 based on the following theoretical ordering:

$$l_NC_t^* \rightarrow l_NIIP_t^i \rightarrow l_PI_t^j \rightarrow l_ME_t^* \rightarrow l_GDP_t^i \quad (9)$$

In the generalized identification ordering above, the variables $l_NC_t^*$ and $l_ME_t^*$ represent the specific variants utilized across the different model specifications. Specifically, $l_NC_t^*$ denotes either the country-specific ($l_NC_t^i$), global ($l_NC_t^{WLD}$), or

extended global versions ($l_NCSII_t^{WLD}$; $l_NCSII2_t^{WLD}$) of the net control indicator. Similarly, $l_ME_t^*$ refers to either absolute military expenditure ($l_ME_t^i$) or military expenditure per capita ($l_MEPC_t^i$), depending on the requirements of the specific robustness check or model variant.

This ordering implies that NC in its various versions can contemporaneously influence all other variables, while the latter can only influence it with a lag.

While the SVAR framework is essential for identifying structural shocks and distinguishing contemporaneous correlations from causal relationships, its application to limited datasets – such as the series beginning in 1998 used in this study – presents significant econometric challenges. In such contexts, traditional SVAR approaches are prone to over-parameterization and overfitting, often capturing random noise rather than true underlying dynamics (Doan et al., 1984; Litterman, 1986). To mitigate these risks, a Bayesian Vector Autoregression (BVAR) methodology was adopted to enhance forecast accuracy and sample fitting through the incorporation of prior beliefs.

The transition to a Bayesian framework addresses these limitations by shifting the inferential focus from fixed parameters to probability distributions. Unlike the frequentist approach, the BVAR methodology treats the observed data as fixed and models the parameters as random variables. This allows for the formal integration of prior information into the estimation process, providing a robust inferential bridge for restricted samples.

The VAR system previously described was rewritten more compactly in matrix form as:

$$y_t = \Phi X_t + u_t \quad (10)$$

where $\Phi = [\mu, A_1, A_2]$ is a matrix that gathers the constants and all the coefficients related to the variables lags, $X_t = [1, y_{t-1}, y_{t-2}]'$ is the matrix that collects the variable lags. It should be noted that u_t is a $k \times 1$ vector, $u_t \sim N(0, \Sigma)$ and its $k \times k$ variance-covariance matrix is Σ .

For the entire data sample, the system was stacked into the following matrix representation:

$$Y = \Phi X + U \quad (11)$$

Applying Bayes' theorem, the posterior distribution $P(\Phi, \Sigma|Y)$ was derived by combining prior information $P(\Phi, \Sigma)$ with the data's likelihood function $P(Y|\Phi, \Sigma)$:

$$P(\Phi, \Sigma|Y) \propto P(Y|\Phi, \Sigma) \cdot P(\Phi, \Sigma) \quad (12)$$

The Minnesota Prior was selected for the coefficients due to its demonstrated precision in macroeconomic forecasting with restricted datasets (Litterman, 1986). It assumes a normal distribution for the coefficients, $P(\Phi) \sim N(\Phi_0, V_\Phi)$. The prior mean (Φ_0) suggests that each variable follows a random walk; specifically, the coefficient on each variable's own first lag was set to one, while all other coefficients were set to zero. The prior variance matrix (V_Φ) acted as a measure of confidence in the prior beliefs; the variance of the coefficients was set to decrease as the lag order increased and was scaled according to the residual variance of the variables. This ensured that more recent information was given greater weight while accounting for the relative volatility of each series in the system.

For the variance-covariance matrix, an Inverse-Wishart distribution was chosen:

$$P(\Sigma) \sim \text{Inverse} - \text{Wishart}(v_0, S_0) \quad (13)$$

where v_0 are the prior degrees of freedom and S_0 are the prior scale parameters. As a conjugate prior to the normal distribution, this choice simplified the analytical derivation of the posterior distribution:

$$P(\Phi, \Sigma|Y) \propto N(\Phi_n, V_n) \cdot \text{Inverse} - \text{Wishart}(v_n, S_n) \quad (14)$$

where Φ_n, V_n, v_n and S_n are the updated posterior parameters, calculated by formally combining the information from the prior and the sample data.

The prior was specified using the Adjusted Dummy-Lag (ADL) method, which generates fictitious observations, known as dummy observations, to define the prior parameters (S_0). By calibrating the prior based on the autoregressive properties of the individual time series, this approach provided greater flexibility and fewer restrictions than traditional prior specifications.

To assess the dynamic interactions within the system, post-estimation analysis included Impulse Response Functions (IRFs).

For the SVAR models, IRFs were estimated to trace the time-path of variable reactions to specific structural shocks, with uncertainty quantified via bootstrap methods (1,999 iterations) to construct 68% confidence intervals. In parallel, BVAR IRFs were calculated using the Markov Chain Monte Carlo (MCMC) method with 10,000 samples and a 0.1 burn-in rate⁷. This process utilized 9,000 stable draws to construct 68% Bayesian credibility intervals for uncertainty quantification.

Finally, FEVDs were computed over a 10-year horizon to determine the relative contribution of each structural shock to the forecast error variance of the endogenous variables. This decade-long interval was selected to capture sustained, long-term impacts, ensuring the results remain relevant for strategic and policy evaluation. Detailed results are reported in Appendix G.

3.3. Results

a. Overview

The causality analysis results for all SVAR and BVAR specifications are summarized in Table 2 (U.S.-China) and Table 3 (Creditor-Debtor blocs). Causal links were identified via Impulse Response Functions (IRFs) over a 10-year horizon. Statistical significance was defined by the exclusion of zero from the 68% confidence intervals (SVAR) or Bayesian credibility intervals (BVAR). To ensure clarity, the following sections focus on the most robust specifications: Models 2 and 6 for bilateral dynamics, and Models 2a and 6a for group-level dynamics.

Table 2. Causality analysis results across various SVAR and BVAR model specifications referred to China and the United States.

China – United States of America			
Model	$NC_{CHN} \rightarrow NIIP_{CHN}$	$NIIP_{CHN} \rightarrow PI_{USA}$	$PI_{USA} \rightarrow ME_{CHN}$
1			
	–	SVAR	SVAR
	–	BVAR	–

Model	$NC_{WLD} \rightarrow NIIP_{CHN}$	$NIIP_{CHN} \rightarrow PI_{USA}$	$PI_{USA} \rightarrow ME_{CHN}$
2			
	<i>SVAR</i>	<i>SVAR</i>	<i>SVAR</i>
	—	—	<i>BVAR</i>
Model	$NCSII_{WLD} \rightarrow NIIP_{CHN}$	$NIIP_{CHN} \rightarrow PI_{USA}$	$PI_{USA} \rightarrow ME_{CHN}$
3			
	<i>SVAR</i>	<i>SVAR</i>	<i>SVAR</i>
	—	<i>BVAR</i>	<i>BVAR</i>
Model	$NCSII2_{WLD} \rightarrow NIIP_{CHN}$	$NIIP_{CHN} \rightarrow PI_{USA}$	$PI_{USA} \rightarrow ME_{CHN}$
4			
	<i>SVAR</i>	<i>SVAR</i>	<i>SVAR</i>
	—	—	<i>BVAR</i>
Model	$NC_{WLD} \rightarrow NIIP_{CHN}$	$NIIP_{CHN} \rightarrow PI_{USA}$	$PI_{USA} \rightarrow MEPC_{CHN}$
5			
	<i>SVAR</i>	<i>SVAR</i>	<i>SVAR</i>
	—	<i>BVAR</i>	—
Model	$NCSII_{WLD} \rightarrow NIIP_{CHN}$	$NIIP_{CHN} \rightarrow PI_{USA}$	$PI_{USA} \rightarrow MEPC_{CHN}$
6			
	<i>SVAR</i>	<i>SVAR</i>	<i>SVAR</i>
	<i>BVAR</i>	—	<i>BVAR</i>

Source: author's elaboration. The natural logarithms of the variables are used. Relationships were verified by impulse response functions (IRFs) over a 10-year horizon, using 68% confidence intervals and Bayesian credibility intervals respectively

Table 3. Causality analysis results across various SVAR and BVAR model specifications referred to creditors and debtors.

Creditors - Debtors			
Model 1	$NC_{CRD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow ME_{CRD}$
	<i>SVAR</i>	—	<i>SVAR</i>
	—	—	<i>BVAR</i>
Model 2a	$NC_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow ME_{CRD}$
	—	<i>SVAR</i>	<i>SVAR</i>
	<i>BVAR</i>	—	<i>BVAR</i>
Model 2b	$NC_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow ME_{CRD}$
	—	<i>SVAR</i>	<i>SVAR</i>
	<i>BVAR</i>	—	—
Model 3	$NCSII_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow ME_{CRD}$

	–	–	<i>SVAR</i>
	<i>BVAR</i>	–	<i>BVAR</i>
Model 4	$NCSII_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow ME_{CRD}$
	–	–	<i>SVAR</i>
	–	–	<i>BVAR</i>
Model 5	$NC_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow MEPC_{CRD}$
	–	<i>SVAR</i>	<i>SVAR</i>
	<i>BVAR</i>	–	<i>BVAR</i>
Model 6a	$NCSII_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow MEPC_{CRD}$
	–	–	<i>SVAR</i>
	<i>BVAR</i>	–	<i>BVAR</i>
Model 6b	$NCSII_{WLD} \rightarrow NIIP_{CRD}$	$NIIP_{CRD} \rightarrow PI_{DBT}$	$PI_{DBT} \rightarrow MEPC_{CRD}$
	–	–	<i>SVAR</i>
	<i>BVAR</i>	–	<i>BVAR</i>

Source: author's elaboration. The natural logarithms of the variables are used. Relationships were verified by impulse response functions (IRFs) over a 10-year horizon, using 68% confidence intervals and Bayesian credibility intervals respectively.

b. Bilateral Dynamics: China and the United States

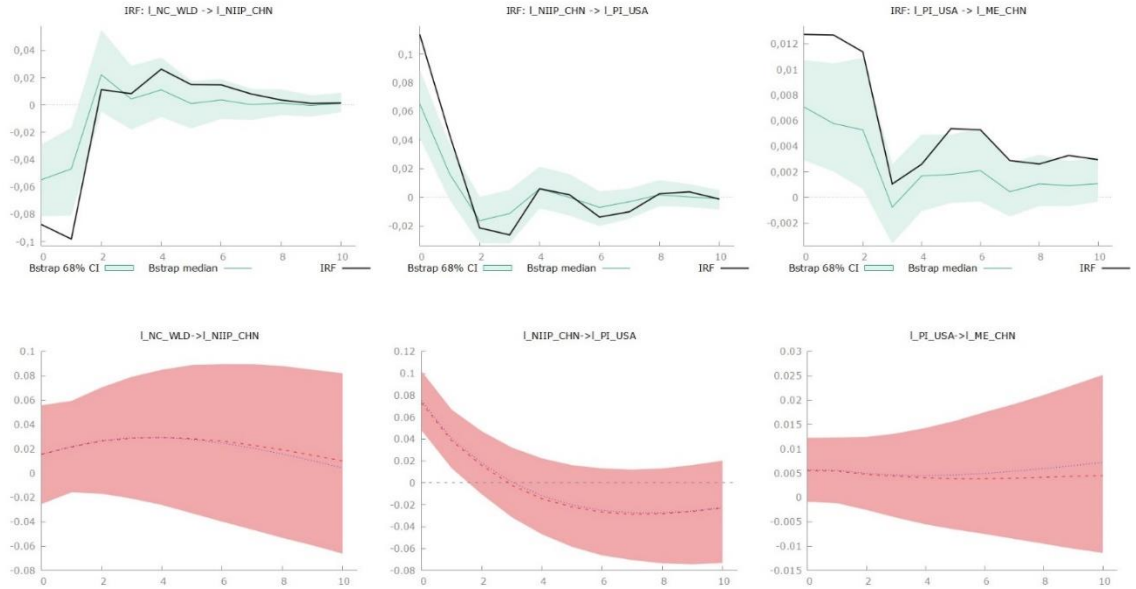
i. Model 2

The analysis of Model 2 yielded three primary findings (see Figure 1). First, SVAR impulse response functions evidenced that an increase in NC^{WLD} – representing a decrease in capital centralization – exerted a negative and statistically significant effect on China's $NIIP$ in the short term, with the effect subsiding within two years. This result indicated that greater global capital centralization was associated with a more substantial Chinese $NIIP$. Consequently, assuming the U.S. $NIIP$ remained constant, a decline in NC^{WLD} would widen the $NIIP$ gap between the two countries. This relationship, however, was not confirmed by the BVAR IRFs, prompting caution when interpreting this specific link within a Bayesian framework.

Second, the SVAR IRFs also demonstrated that an increase in China's $NIIP$ had a positive and significant effect on the U.S. PI in the short term, with the effect also subsiding within two years. This implies that as China's $NIIP$ grew, indicating a wider gap with the U.S., the U.S. responded with increased protectionist measures. This causal link

was further validated by the BVAR IRFs, providing robust empirical support for this interaction.

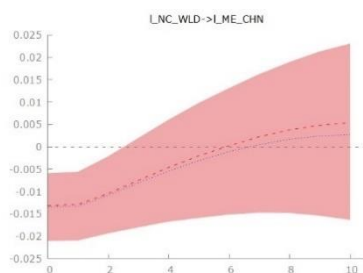
Figure 1. U.S.-China Model 2: impulse response functions (IRFs) – SVAR in the top panel, BVAR in the bottom panel – of: i) Chinese NIIP to a shock in NC^{WLD} ; ii) U.S. PI to a shock in the Chinese NIIP; iii) Chinese ME to a shock in the U.S. PI.



Source: author's elaboration.

Finally, the SVAR IRFs indicated that an increase in the U.S. *PI* had a positive and statistically significant effect on Chinese *ME* in the short term, with the shock dissipating within two years. This signals a potential counterreaction by China in terms of military expenditure in response to intensified U.S. protectionism. While this result was not supported by the BVAR model's IRFs, a distinct finding from the BVAR IRF in Figure 2 was noteworthy. This figure illustrates that an increase in NC^{WLD} – a decrease in capital centralization – was associated with a decrease in Chinese *ME*. In other words, a rise in capital centralization was directly linked to an increase in Chinese military spending in the short term, underscoring how the centralization of capital may act as a primary driver for the global arms race.

Figure 2. U.S.-China Model 2: BVAR impulse response function (IRF) of Chinese *ME* to a shock in NC^{WLD}



Source: author's elaboration.

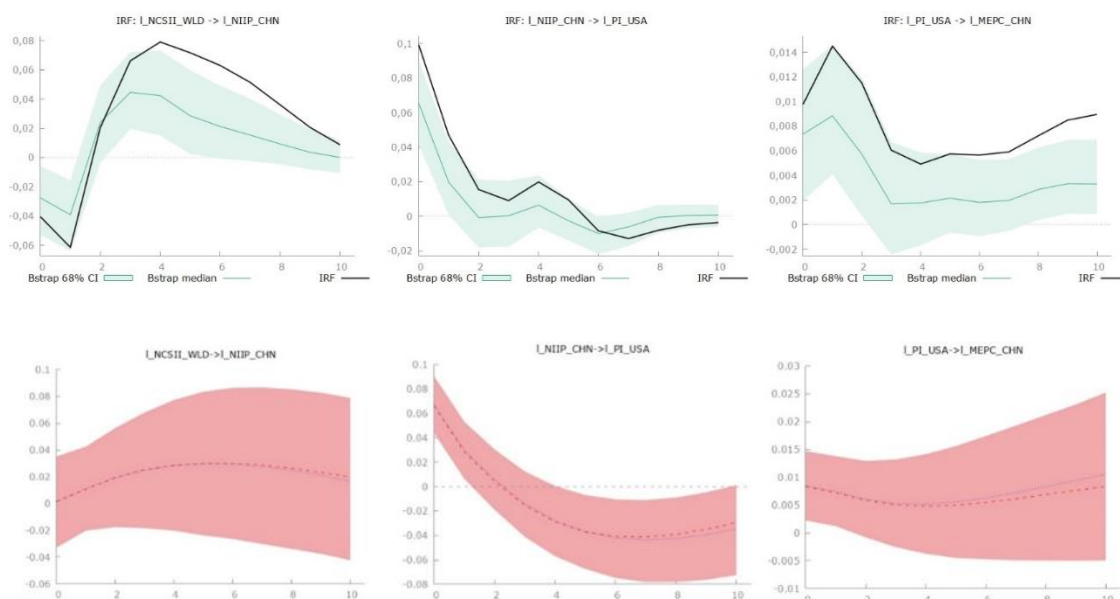
ii. Model 6

Model 6 largely corroborated the baseline findings. The SVAR impulse response functions revealed that an increase in $NCSII^{WLD}$ had a negative and statistically significant short-term effect on China's *NIIP*, which dissipated within two years. The BVAR IRF for the same variables confirmed this relationship over a broader medium to long-term horizon, lasting up to four years.

Furthermore, the SVAR IRFs indicated that an increase in China's *NIIP* corresponded to an increase in the U.S. *PI* in the short term, with the impact fading within two years. This causal relationship, however, was not confirmed by the BVAR IRF.

Finally, both the SVAR and BVAR IRFs established that an increase in the U.S. *PI* led to an increase in China's *MEPC* in the short term, with the impact subsiding within two years. For the SVAR model, this relationship persisted in the long term, with the effect remaining significant for seven years, highlighting the enduring nature of protectionist shocks on military escalation.

Figure 3. U.S.-China Model 6: impulse response functions (IRFs) – SVAR in the top panel, BVAR in the bottom panel – of: i) Chinese *NIIP* to a shock in $NCII^{WLD}$; ii) U.S. *PI* to a shock in the Chinese *NIIP*; iii) Chinese *MEPC* to a shock in the U.S. *PI*.



Source: author's elaboration.

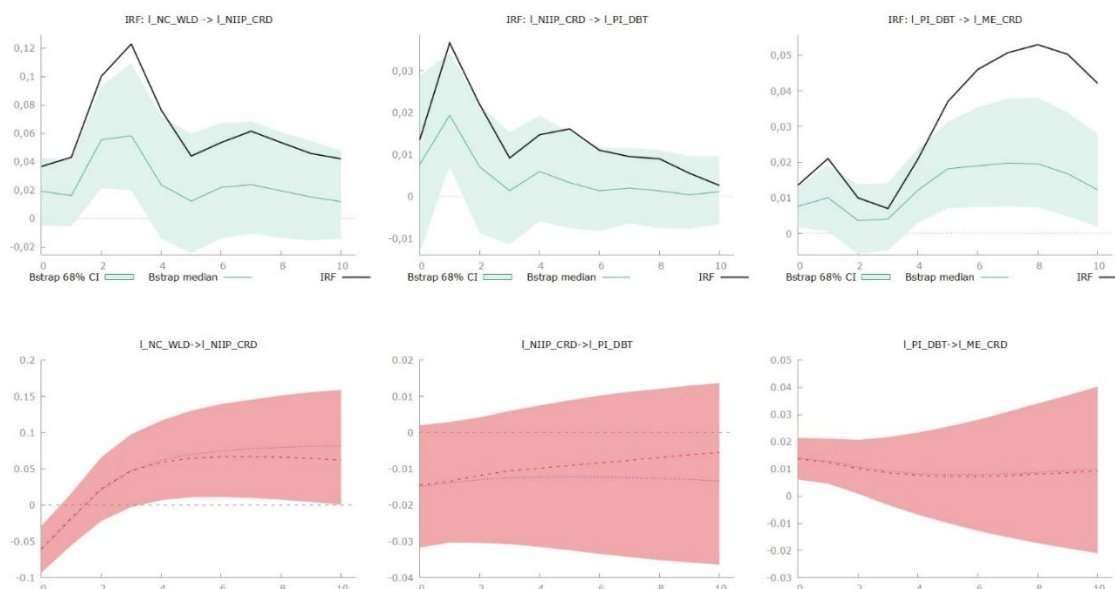
c. Group-Level Dynamics: Creditors and Debtors

i. Model 2a

The interactions observed at the country level were broadly reflected in the group-level analysis of Model 2a (Figure 4). The BVAR IRFs highlighted that a decrease in NC^{WLD} , which indicates increased capital centralization, was associated with a rise in creditors' *NIIP* in the short term, with the effect's influence fading within a year. In contrast, the SVAR IRFs did not yield statistically significant results for this specific interaction.

However, the SVAR model did exhibit a positive and statistically significant relationship between the creditors' *NIIP* and the debtors' *PI* in the short term, with the shock dissipating within two years. This suggests that a widening *NIIP* gap between the two blocs of countries leads to a short-term protectionist response from debtors. The BVAR IRF for these two variables was statistically insignificant.

Figure 4. Creditors-Debtors Model 2a: impulse response functions (IRFs) – SVAR in the top panel, BVAR in the bottom panel – of: i) creditors' *NIIP* to a shock in NC^{WLD} ; ii) debtors' *PI* to a shock in the creditors' *NIIP*; iii) creditors' *ME* to a shock in the debtors' *PI*



Source: author's elaboration.

Finally, both the SVAR and BVAR IRFs confirmed that increased *PI* by debtors had a positive and statistically significant effect on creditors' *ME*. For both models, the impact faded over a two-year horizon, but the SVAR model also verified this relationship in the longer term, with the effect subsiding within three years.

ii. Model 6a

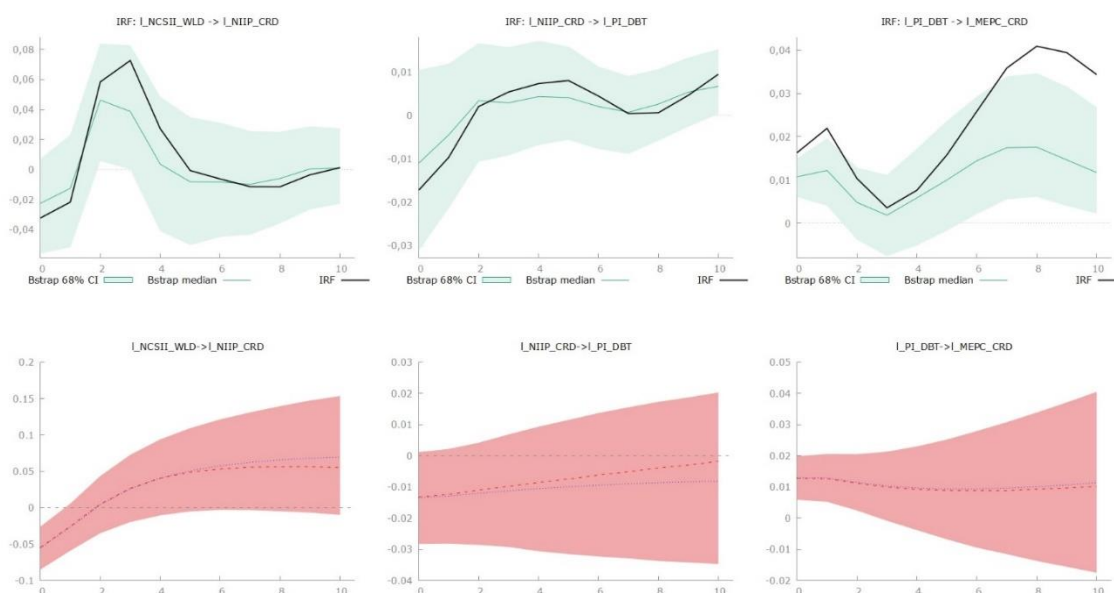
Model 6a provided nuanced support for the hypothesized relationships.

The analysis uncovered mixed results regarding the impact of $NCSII^{WLD}$ on creditors' *NIIP*. Only the BVAR impulse response function recorded a short-term negative effect, which dissipated within a year, while the SVAR IRF found no statistically significant relationship.

Similarly, neither the SVAR nor the BVAR IRFs identified a significant relationship between creditors' *NIIP* and the debtors' *PI*. As discussed in Appendix H, this lack of significance may be attributed to the limitations of *NIIP* as a comprehensive proxy for financial control in aggregate blocs.

In contrast, a statistically significant and positive relationship was observed between *PI* and *MEPC*, aligning with findings for China and the U.S.. Both the SVAR and BVAR models demonstrated that heightened protectionism by debtors positively and significantly affected creditors' short-term military spending, with this effect subsiding within two years. The SVAR model also suggested this relationship held over the long term, with the impact waning only within six years, confirming that protectionism serves as a consistent catalyst for military intensification at a systemic level.

Figure 3. Creditors-Debtors Model 6: impulse response functions (IRFs) – SVAR in the top panel, BVAR in the bottom panel – of: i) creditors' *NIIP* to a shock in *NCSII^{WLD}*; ii) debtors' *PI* to a shock in the creditors' *NIIP*; iii) creditors' *MEPC* to a shock in the debtors' *PI*.



Source: author's elaboration.

4. Discussion

4.1. Summary and interpretation of findings

The findings of this study provide a formal verification of the causal link between capital centralization and military escalation. The econometric results, validated through the integrated SVAR and BVAR framework, substantiate the core hypothesis: the international accumulation of assets by creditor nations constitutes an inherent centralizing force that triggers a defensive, protectionist reaction within debtor nations.

This cycle of escalation establishes a specific causal sequence where diverging net international investment positions prompt debtors to implement tariffs, sanctions, and “friend-shoring” practices. These measures constrain the economic maneuverability of the creditor group, triggering a strategic counterreaction characterized by increased military expenditure to secure financial interests. By quantifying these interactions through Impulse Response Functions (IRFs), this study demonstrates that the tendential law of capital centralization serves as a quantifiable, systemic cause of the two main conditions that can lead to the outbreak of war: highly confrontational protectionism and increased military spending.

Ultimately, these findings suggest that today’s geopolitical tensions are fundamentally rooted in the systemic motion of capital, necessitating a re-evaluation of global security through the lens of international macro-finance. By identifying the shift from free trade to protectionism as a pivotal intermediate step, this study confirms that trade wars are not merely isolated policy choices but are systemic symptoms of the underlying struggle for financial control.

4.2. Policy implications

The confirmed causal chain linking capital centralization to military escalation presents a fundamental challenge to global stability. Building on the framework of Brancaccio, Giammetti, and Lucarelli (2024), the evidence suggests that the current “imperialist” trajectory of international relations is rooted in the systemic motion of capital. Consequently, policy interventions must shift from reactive trade barriers toward the proactive regulation of global capital centralization.

At the core of this strategy lies a redefinition of monetary policy that moves beyond the neoclassical Taylor Rule. While the Taylor Rule views the central bank as a neutral arbiter of inflation and growth, this study advocates for the adoption of a “solvency rule”. Under this perspective, central banks do not merely manage business cycles; they regulate the solvency conditions of the entire economic system (Brancaccio, 2013; 2018). By adjusting interest rates, monetary authorities influence the frequency of firm bankruptcies and the pace of mergers and acquisitions, thereby directly governing the Marxian tendency toward capital centralization. Specifically, a restrictive monetary policy characterized by higher interest rates reduces net control, as fewer firms can generate sufficient profits to offset increased borrowing costs. This dynamic accelerates the centralization of capital through liquidations and acquisitions, demonstrating that the degree of monetary restriction directly determines the pace of systemic capital consolidation.

To avert geopolitical conflict, this solvency rule must be applied as a “pacification rule” aimed at achieving a global “steady state” of centralization. This stationary state requires a monetary stance where the real accumulation rate of capital – the inflation-adjusted growth of the capital stock – consistently exceeds the real interest rate. By maintaining this equilibrium, interest rates would play a more stable role, preventing abrupt reactions to fluctuations in capital centralization and neutralizing the aggressive accumulation that fuels protectionism and subsequent military responses.

Implementing this “pacification rule” on an international scale necessitates a radical shift in global economic governance that moves beyond simple market mechanisms like flexible exchange rates. It requires comprehensive global policy coordination to prevent destabilizing shifts in net capital control, alongside strict regulations on international capital movements to mitigate the financial imbalances that lead to debtor-creditor friction.

Ultimately, macroeconomic stabilization requires a structural reform of the international financial architecture – potentially via a Keynesian-style International Clearing Union (ICU) – to manage imbalances without resorting to force. Keynes's 1944 proposal sought to establish a global central bank using a neutral currency, the Bancor, to create a symmetrical system of international exchange. By imposing limits and negative

interest rates on both accumulated surpluses and deficits, the ICU would have forced surplus countries to spend and deficit countries to adjust, preventing the destabilizing reserve accumulations that fuel protectionism. Although rejected at Bretton Woods in favor of the dollar-centric IMF and World Bank, Keynes's vision anticipated that a single national currency at the heart of global trade would inevitably be used as a financial weapon. Today, resurrecting this vision of equitable, incisive global governance is essential to prevent the financial imbalances of the 21st century from transitioning into systemic conflict.

Because today's fragmented landscape precludes a simple return to Bretton Woods, this reform must be navigated through a "parallel tracks" model (Hamilton, 2025). This approach facilitates deep cooperation within aligned groups while maintaining a broader structure for coordination between rival blocs – most notably the U.S. and China. Such a model allows for an incremental evolution of multilateralism in a multipolar world (Sachs, 2024), where a non-catastrophic transition depends on the West's ability to reconcile with the economic rise of East Asia (Arrighi & Silver, 1999).

These tensions remain insoluble unless the international payments system is fundamentally rethought to move beyond hegemonic currencies. This perspective, echoed by Brancaccio, Skidelsky, Gomez-Betencourt et al. (2023), rejects the "clash of civilizations" narrative, identifying geopolitical conflict instead as a structural product of deregulated economic contradictions. With the post-WWII architecture – the United Nations, International Monetary Fund, and World Trade Organization – becoming increasingly obsolete, the path forward requires the development of new, plurilateral bodies capable of managing a multipolar reality. Rebalancing the global order is therefore not merely a diplomatic task, but a macroeconomic necessity to ensure that capital competition does not manifest as systemic war. Similarly, Rodrik (2024) suggests that the current phase of de-globalization could yield a superior, more resilient economic order if the reality of multipolarity is accepted and structurally integrated into global governance.

4.3. Limitations and Future Research

An analysis of the Forecast Error Variance Decomposition (FEVD) in Appendix G identified three primary methodological challenges that offer significant direction for future research.

First, in the bilateral and group-level specifications (Models 2, 2a, 6 and 6a), the variance of military expenditure, both in absolute (ME) and per capita terms (MEPC), was only minimally explained by shocks in the protectionist index (*PI*). Instead, military spending appeared more significantly driven by internal shocks within China's – or the creditor bloc's – own net international investment position (*NIIP*). This suggests that military buildup in creditor nations, exemplified by China, may function as a direct, internal response to domestic capital accumulation and the resulting systemic economic tensions, rather than a purely exogenous reaction to foreign trade barriers. While this identifies a gap in the model's external causal chain, it paradoxically reinforces the core thesis that capital centralization serves as a fundamental, systemic driver of military buildup.

Second, the FEVD for the aggregate models (2a and 6a) indicated that the variance of the debtor bloc's protectionism (*PI*) was only weakly explained by shocks in the creditors' *NIIP*. This limitation likely stems from the fact that *NIIP* acts as a suboptimal proxy for the actual financial control exerted by one country over another. Crucially, this metric fails to distinguish between passive investments, such as sovereign debt holdings, and strategic acquisitions in corporations that govern global supply chains or emerging technological paradigms. Furthermore, a creditor surplus does not inherently translate into the net income growth required to reward investment and consolidate a dominant international position. Future research should therefore employ historical series of net income generated from the *NIIP*, which is better suited to capture this intricate financial relationship and the actual returns that strengthen a creditor's systemic influence.

Finally, the results from Model 6a demonstrated that $NCSII^{WLD}$ explained only a minimal fraction of the variance in the creditors' *NIIP*. This finding further underscores the need for a refined proxy for financial control – one that not only effectively captures

the determinants of debtors' *PI* but is itself sensitive to the broader dynamic of global capital centralization.

5. Conclusion

Despite the identified methodological limitations, this study provides robust empirical support for the causal link between capital centralization, protectionism, and military expenditure. By validating the “economic-to-military” transmission mechanism, the findings suggest that the current trajectory of international relations is a structural byproduct of capital's systemic motion rather than a series of isolated diplomatic failures.

This rapid deterioration of international order threatens social well-being, as protectionist tensions and military spending divert critical resources from civilian use, potentially exacerbating poverty and income inequality for the most vulnerable (Giammetti & Palley, 2024).

If we adopt the perspective we have sought to argue for in this paper, what emerges first and foremost is the need to move beyond the logic of military escalation as a means of reestablishing international order. The results we have presented show, rather, that protectionist tensions and the resulting trends toward increased military spending are caused by growing financial instability, as measured by the widening gap between net foreign assets and liabilities—the former attributable primarily to China and the latter primarily to the United States.

In turn, this situation was greatly facilitated by financial deregulation, which fostered the centralization of capital and the tendency of Eastern creditors to seek to acquire Western debtors.

Ultimately, achieving a stable peace requires moving beyond reactive measures toward a proactive, macroeconomic reform of the international financial architecture.

APPENDICES

Appendix A: *Country selection*

The study's initial sample included eight countries exhibiting the most significant positive and negative *NIIP*. These were divided into two groups: creditors (China, Russia, Saudi Arabia, and Germany) and debtors (United States, United Kingdom, France, and Australia). The selection of these countries was based on their significant and contrasting *NIIP*, as well as their clear geopolitical alignments.

For the creditor group, China and Russia were included as key players in the geopolitical bloc challenging the U.S.-led international order. Their substantial capital surpluses have been actively deployed in recent years to acquire Western assets and counter Western dominance. Saudi Arabia, a major oil exporter, represents a crucial creditor nation with a powerful economic position. While historically aligned with the U.S., it is increasingly pursuing independent strategic interests, as evidenced by its pivot towards the BRICS+ group. Germany was included as a major European economic power and creditor. Moreover, Germany's political stance toward Russia and China has also changed considerably over time. At least through 2022, trade and financial integration with these two countries clearly reflects a common economic development strategy (Halevi, 2023).

For the debtor group, the United States, United Kingdom, and France were selected as the primary representatives of the Western economic and military alliance, all characterized by significant external debt positions. Australia was incorporated as a key U.S. ally in the Asia-Pacific region with a persistent trade deficit, making it a clear example of a Western-aligned debtor nation.

The initial groups were subsequently expanded to five countries each to test models' robustness. Iran was added to the creditor group due to its trade surplus and its firm position within the Sino-Russian geopolitical bloc, opposing the United States and its allies. New Zealand was included in the debtor group owing to its trade deficit and its alignment with the geopolitical West, exemplified by its membership in the Five Eyes (FVEY) intelligence alliance, alongside the U.S., the UK, Canada and Australia.

Several nations were intentionally excluded to avoid potential statistical distortions. Japan and South Korea were omitted from the creditor group. Despite their positive net investment positions, their strong geopolitical alignment with the Western bloc – particularly in their efforts to counter China's growing influence – made them unsuitable for a group intended to represent non-Western-aligned nations. Additionally, Japan's increasing net control as illustrated in Figure 6 represents a countertrend to the general pattern of capital centralization, further complicating its inclusion. India and Brazil were excluded from the debtor group due to their “multi-aligned” foreign policies. Unlike the selected countries, these nations do not fully commit to a single political bloc, which would have introduced confounding variables into the analysis. India provides a clear example of this: while being a BRICS+ member, it maintains strong historical ties with the UK and collaborates with the U.S., Australia, and Japan through the informal strategic forum Quad (Quadrilateral Security Dialogue). This complex web of relationships illustrates a non-aligned foreign policy that would have made its inclusion in a specific bloc misleading.



Figure 4. Trend of NC in Japan between 1998 and 2019. Source: author's elaboration.

Appendix B: Data aggregation techniques

To facilitate a group-level analysis, it was necessary to aggregate the variables of the individual states into representative bloc variables. The following methodology was employed for this purpose.

For the creditors' *NC* for Model 1, we calculated a year-by-year weighted average of the individual countries' *NC*. The weighting variable selected was *GDP* per capita in current U.S. dollars, sourced from the World Integrated Trade Solution (WITS) website, as it provides a standardized metric for cross-country comparisons. Russia was excluded from this specific calculation due to limited data availability regarding its *NC*. Since China's *NC* data includes Hong Kong, the per capita *GDP* used for its weighting was adjusted using the following formula:

$$GDP_{Hong\ Kong} \times \frac{GDP_{Hong\ Kong}}{GDP_{Hong\ Kong} + GDP_{China}} + GDP_{China} \times \frac{GDP_{China}}{GDP_{Hong\ Kong} + GDP_{China}} \quad (15)$$

The aggregate variables for *NIIP*, *PI*, *ME*, and *GDP* for each country bloc were calculated by summing the absolute year-by-year values of the individual countries within the respective groups.

Finally, for *MEPC* at the group level, we standardized the data by dividing the total *ME* of the bloc by the total population of all member countries, with population data sourced from the United Nations website.

Appendix C: Strategic investment index (*SII*)

Since the historical series for *NC* was limited to 2019, an alternative centralization indicator was developed to extend its time series up to 2024. This indicator, named the Strategic Investment Index (*SII*), was constructed based on the strategic value of both attempted and completed acquisitions and investments originating from the creditor bloc into companies in the debtor bloc between 1998 and 2024. Unsuccessful attempts were also included in the calculation, albeit with a lower relative weight, to capture the strategic intent of capital expansion during the period.

The data for this index were compiled through a cross-analysis of various financial databases, such as Refinitiv, and specialized international press sources, including *The Financial Times*, *The Wall Street Journal*, and *The Economist*. Each transaction, detailed in Table 4, was assigned a qualitative-quantitative score based on four primary criteria: sector criticality, geopolitical impact, technological transfer, operational governance. The criticality of the selected sectors is anchored in the literature on global value chain (GVC)

bottlenecks, where sectors such as semiconductors and frontier AI are identified as “essential inputs” characterized by low elasticity of substitution. These sectors represent critical nodes where dependency creates asymmetric leverage, allowing the creditor bloc to exert control over the structural trajectory of the debtor’s industrial base. Technological transfer is evaluated through the lens of absorptive capacity and tacit knowledge migration, as conceptualized by Cohen and Levinthal (1990). In this index, acquisitions are weighted by the degree to which they facilitate the capture of “technological moats” – proprietary intellectual property or R&D command – thereby reducing the acquirer’s innovation gap. This approach shifts the focus from purely financial capital movement to the strategic harvesting of core technical competencies. Finally, to complete the scoring framework, the index adjusts these qualitative assessments by the degree of operational control; transactions involving majority ownership or active management are weighted more heavily than those involving minority stakes with limited board influence, ensuring the index reflects both the strategic value of the asset and the acquirer’s actual capacity to leverage it.

For each year, the individual scores were aggregated and rounded to the nearest integer, while the strategic scores for sustained, multi-year operations, were distributed across the relevant years using a simple arithmetic average.

Year	Transaction Type	Acquirer	Target	Sector	Score	Notes
1998	Complete Acquisition	Daimler-Benz (Germany)	Chrysler (U.S.)	Automotive	8	Major impact on the global auto industry, transatlantic integration, and access to the U.S. market.
2005	Complete Acquisition	Lenovo Group (China)	IBM's PC Division (ThinkPad) (U.S.)	Tech (PC hardware)	7	Gained access to an iconic brand, technology, and market, establishing a foundation for Lenovo's global expansion.
2005	Acquisition Attempt	CNOOC (China)	Unocal (U.S.)	Oil & Gas (Energy)	9	Posed a grave strategic threat to the U.S. due to national security implications from Chinese control over U.S. energy assets and its symbolic value as a challenge

						to American dominance.
2006	Complete Acquisition	DP World (United Arab Emirates)	P&O Steam Navigation Company (UK), including U.S. port management contracts	Critical Infrastructure (Port Management)	9	Extremely high geopolitical sensitivity, involving control of critical infrastructure in the U.S. and UK.
2006	Acquisition Attempt	Gazprom (Russia)	Centrica (UK)	Raw Materials (Gas, Energy), Critical Infrastructure (Distribution)	8	The deal had the potential for control of vital energy infrastructure and high geopolitical relevance, but was not completed.
2006	Complete Acquisition	China National Bluestar Group (China, subsidiary of ChemChina)	Adisseo (France)	Raw Materials (Animal Nutrition/ Chemicals)	6	Provided access to market-leading technology and a key sector for the food chain, which was highly relevant for China.
2011	Significant Stake Acquisition	China Three Gorges Corporation (China)	EDP - Energias de Portugal (Portugal), with assets in the U.S. and UK (via subsidiaries)	Critical Infrastructure (Energy, Renewables)	8	Strategic investment in European and North American critical renewable energy infrastructure, part of the “Belt and Road” initiative.
2012	Majority Stake Acquisition (60%)	Bright Food Group (China)	Weetabix Limited (UK)	Agriculture /Food Processing (Consumer Brand)	5	Granted access to an established brand and food supply chain in Europe, relevant for Chinese food security, but less “critical” than other sectors.
2013	Complete Acquisition	CNOOC Ltd. (China)	Nexen Inc. (Canada), with assets in the U.S. and UK	Raw Materials (Oil and Gas)	9	Gained direct access to proven energy reserves and advanced technology, vital for Chinese energy security, and raised geopolitical concerns.
2014	Complete Acquisition	China Molybdenum Co. Ltd. (CMOC) (China)	Northparkes copper-gold mine in Australia	Raw Materials (Copper, Gold)	8	Gained control of critical resources essential for Chinese industry, as part of its metals supply strategy.
2015	Minority Stake Acquisition	Chinese Consortium (China Media Capital - CMC and	City Football Group (Manchester City and other clubs) (UK)	Sport (Soccer)	4	An example of soft power, aimed at promoting soccer in China, with less direct impact on critical

		CITIC Capital)				infrastructure or technology.
2016	Majority Stake Acquisition	COSCO Shipping Ports Ltd. (China)	Piraeus Port Authority (Greece)	Critical Infrastructure (Ports, Maritime Logistics)	9	A landmark “Belt and Road” operation, granting control over a crucial logistical hub for Europe, with high geopolitical relevance.
2016	Majority Stake Acquisition	Tencent Holdings Ltd. (China)	Supercell (Finland)	Tech (Gaming, Mobile Tech)	7	Consolidated leadership in mobile gaming, providing access to successful IPs and a large user base, with relevance for the Chinese tech industry.
2016	Majority Stake Acquisition	Suning Holdings Group (China)	Inter Milan (Soccer) (Italy)	Sport (Soccer)	4	An example of soft power, aimed at brand promotion in Asia, with less direct impact on critical infrastructure or technology.
2016	Stake Acquisition	COSCO Shipping Ports Ltd. (China)	Port of Zeebrugge (Belgium)	Port Infrastructure	8	Expanded Chinese port influence in Europe, with relevance for global logistics and trade.
2017	Stake/Complete Acquisitions	Chinese groups (e.g., Shandong Ruyi Group, Fosun International)	Fashion/luxury brands in France, Italy, or the UK (e.g., SMCP, Lanvin)	Fashion/Luxury	4	Acquisition of cultural assets and valuable brands for soft power and market expansion, but less strategic than tech or infrastructure.
2017	Complete Acquisition	ChemChina (China)	Syngenta AG (Switzerland)	Raw Materials (Agriculture - crop protection, seeds)	9	The largest acquisition ever by a Chinese company, providing access to advanced agricultural technology and food security, with extremely high strategic relevance.
2017	Stake Acquisition (5%)	Tencent Holdings Ltd. (China)	Tesla Inc. (U.S.)	Tech (Electric Automotive, AI, Software, Autonomous Driving)	7	Strategic investment in groundbreaking technology, providing indirect influence and access to data and know-how in a key future sector.
2017	Complete Acquisition	Canyon Bridge Capital Partners (fund with Chinese capital)	Imagination Technologies (UK)	Tech (Semiconductors, Intellectual Property - GPU)	9	Gained access to critical IP and technology in the semiconductor sector, leading to significant national security concerns.

2017	Minority Stake Acquisition (10%)	CITIC Group (China)	Glencore (Switzerland /UK)	Raw Materials (trading and production)	7	Strategic investment to gain access to global resources and expertise in raw materials trading, with relevance for China.
2018	Complete Acquisition (prevented IPO)	SAP SE (Germany)	Qualtrics (U.S.)	Tech (Software, Cloud, Experience Management)	7	Strengthened SAP's position in the cloud market by acquiring advanced technology and an innovative team.
2018	Complete Acquisition	SAP SE (Germany)	CallidusCloud (U.S.)	Tech (Software, Cloud, Sales Performance Management)	6	Expanded SAP's cloud portfolio and integrated business solutions.
2019	Controlling Stake Acquisition	Wingtech Technology (China)	Nexperia (Netherlands , formerly NXP)	Tech (Semiconductors)	9	Further consolidated Chinese control over the semiconductor supply chain by acquiring production capacity and technology.
2020	Complete Acquisition	Infineon Technologies AG (Germany)	Cypress Semiconductor Corp. (U.S.)	Tech (Semiconductors)	8	Created a semiconductor giant, strengthening Europe's position in a critical sector and creating synergies in automotive and IoT.
2021	Majority Stake Acquisition	Public Investment Fund (PIF) of Saudi Arabia	Newcastle United Football Club (UK)	Sport (Soccer)	5	Part of a soft power strategy, aimed at economic diversification and country image promotion; not critical infrastructure or tech, but has geopolitical relevance.
2023	Complete Acquisition Attempt	Public Investment Fund (PIF) of Saudi Arabia	Formula 1 from Liberty Media (U.S. / Global)	Sport (Formula 1) / Media	6	Massive soft power and diversification investment, aiming for control of a high-profile global media asset and country image relevance.
2010-2024	Investments / Acquisitions	Huawei (China) or other Chinese telecommunications companies	Tech startups/companies in Europe (France, UK) or the U.S.	Telecommunications (5G, IoT, AI for Networks)	9 (0.60 per year)	Gained access to critical technology for future digital infrastructure, with strong geopolitical and national security relevance.
2010-2024	Attempts / Stake Acquisitions	Tsinghua Unigroup	Chip companies in	Tech (Chips/Se	10 (0.67	Maximum strategic relevance: Control

		(China) or Chinese funds	the U.S. or Europe (France, UK)	micronductors)	per year)	over the semiconductor industry, a crucial sector for all modern technology, with high political sensitivity.
2010-2024	Acquisitions	Humanwell Healthcare Group (China) or other Chinese pharmaceutical groups	Pharmaceutical/biotech companies/divisions in the U.S. or UK	Biotech/Pharmaceuticals	7 (0.47 per year)	Provided access to R&D, new molecules, and drug pipelines, which are important for public health and national security in terms of pharmaceuticals.
2010-2024	Investments / Acquisitions	Alibaba Group (China) or Tencent (China)	Software startups/SMEs in the U.S., UK, or France	Software (E-commerce, Cloud, Fintech, AI)	7 (0.47 per year)	Provided access to innovative software technology, data, and growing market positions.
2010-2024	Acquisitions	T-Systems (Germany)	IT services or data center companies in the U.S. or UK	IT Services / Data Center	6 (0.40 per year)	Strengthened Europe's position in IT services and cloud infrastructure, with relevance for data sovereignty.
2010-2024	Acquisitions / Investments	State funds or Chinese companies (e.g., Chongqing Grain Group)	Large tracts of agricultural land or farms in the U.S. or France	Agriculture /Land	8 (0.53 per year)	Direct control over food production, which is crucial for long-term food security.
2010-2024	Stake Acquisitions	Sinopec (China) or PetroChina (China)	Shale/natural gas fields in the U.S. or exploration/production companies	Oil and Gas (Energy Raw Materials)	9 (0.60 per year)	Gained access to unconventional energy resources, vital for Chinese energy security, with a strong geopolitical impact.
2010-2024	Acquisitions	SF Express (China) or other Chinese logistics companies	Logistics hubs, warehouses, or small courier companies in the UK, France, or the U.S.	Logistics/Infrastructure	7 (0.47 per year)	Expanded distribution networks and integrated with e-commerce, with relevance for supply chains.
2010-2024	Attempts / Acquisitions	AVIC (China) or other Chinese aerospace-related entities	Small companies/divisions that produce precision aeronautical components or advanced technology in the UK, France, or the U.S.	Aeronautics/Components (Precision Technology)	9 (0.60 per year)	Gained access to dual-use technology and expertise in a key sector for defense and the aerospace industry, with high sensitivity.
2012-2016	Complete Acquisition	COFCO (China)	Nidera (Netherlands)	Agriculture (Agriculture)	8 (1.60)	Gained significant control over the

			) and Noble Agri (Singapore/Hong Kong)	al Raw Materials Trading)	per year)	global food supply chain, which is crucial for Chinese food security.
2024	Stake Acquisitions/Joint Ventures/Strategic Investments	Public Investment Fund (PIF) of Saudi Arabia	Various tech/sports/entertainment companies in the U.S. and UK	Tech (general), Sports, Media, general IT Services	6	A strategy to diversify the economy through investments in soft power, tech, and entertainment.
2024	Complete Acquisitions/Investments	German companies (e.g., BMW, Volkswagen for automotive tech; Siemens for industrial software/AI)	Tech startups, component suppliers, software/AI companies in the U.S. and UK	Automotive (with a strong tech component), Software/AI for industry, Robotics	7	Strengthened the position of German companies in the tech-driven automotive and industrial sectors.

Table 4. List of attempted and completed acquisitions and investments between 1998 and 2024 considered in the construction of the *SII*. The table details the operation date, acquisition type, acquiring company, acquired company, sector, the assigned strategic score and notes on the transaction. Source: author's elaboration.

Appendix D: Extending net control data

The NC^{WLD} historical series was extended by incorporating observations from 2020–2024 using the *SII*, discussed in the previous appendix.

The core assumption for this extension was that acquisitions, particularly strategic ones, drive capital concentration. Consequently, a negative correlation between the *SII* and NC^{WLD} was expected, as an increase in acquisitions should correspond to a decrease in NC^{WLD} (reflecting higher concentration). A correlation of -0.32028 was calculated between NC^{WLD} and the *SII*, supporting this hypothesis.

The extension was performed using two distinct techniques: a regression-based approach and a ratio-based scaling method.

The first technique involved an Ordinary Least Squares (OLS) regression with robust standard errors, estimated over the historical period of 1998–2019. In this model, NC^{WLD} served as the dependent variable and *SII* as the independent variable, as specified by the linear model in Eq. (16):

$$NC_t^{WLD} = \beta_0 + \beta_1 SII_t + \varepsilon_t \quad (16)$$

The resulting coefficient estimate for SII (β_1), detailed in Table 5, was negative and statistically significant (p-value of 0.015), consistent with the hypothesized inverse relationship.

Regression Statistics	
Observations	22
$F(1,20)$	7.14
Prob > F	0.0146
R^2	0.1026
Root MSE	0.0028

	Coefficients	Standard	t-Stat	P-value	Lower 95%	Upper 95%
Intercept	-0.0000799	0.0000299	-2.67	0.015	-0.0001422	-0.0000175
SII	0.0109755	0.0007061	15.54	0.000	0.0095027	0.0124483

Table 5. OLS regression output of NC^{WLD} on SII (1998-2019). Source: author's elaboration.

However, the regression results, presented in Table 5, revealed certain limitations that necessitated careful interpretation. The exceptionally small magnitude of β_1 (-0.0000799) and the low R^2 value of 0.1026 collectively suggested a minimal effect of the SII on NC^{WLD} , implying that unobserved factors captured in the error term ε_t might substantially dominate the dynamics of the series.

Despite these limitations, the decision to utilize this OLS model was methodologically robust due to its compelling statistical validity. First, the model was collectively significant, as confirmed by the robust F-statistic of 7.14 (p-value of 0.0146), allowing for the rejection of the null hypothesis that SII has no effect on NC^{WLD} . Second, β_1 itself was statistically significant at the 5% level, confirming that the hypothesized inverse relationship was highly unlikely to be due to chance. Therefore, the model established a statistically defensible, theory-driven benchmark.

The estimated OLS model from Eq. (16) was subsequently used to forecast the NC^{WLD} values for the 2020–2024 period. The SII values for these years were substituted into Eq. (16) to generate the projected NC^{WLD} series, designated as $NCSII$. This predictive application is formally expressed by Eq. (17):

$$NCSII_t^{WLD} = \beta_0 + \beta_1 SII_t \quad (17)$$

The second technique employed a ratio-based approach to extend the NC^{WLD} time series.

The initial step involved calculating a year-by-year proportionality constant (k_t) by taking the ratio of the NC^{WLD} and SII series across the historical sample period (1998–2019), as defined in Eq. (18):

$$k_t = \frac{SII_t}{NC_t^{WLD}} \quad (18)$$

Given the high variability observed in the resulting ratios, the arithmetic mean of these constants was computed to establish a representative average constant ($\bar{k}$), where T represented the number of years in the sample ($T = 22$), as shown in Equation (19):

$$\bar{k} = \frac{1}{T} \sum_{t=1998}^{2019} k_t \quad (19)$$

This average constant ($\bar{k}$) was used to forecast the missing NC^{WLD} values for the 2020–2024 period. The new projected NC^{WLD} series, termed $NCSII2$, was generated by multiplying the SII values for each forecast year by $\bar{k}$, as specified in Eq. (20):

$$NCSII2_t^{WLD} = \bar{k} \cdot SII_t \quad (20)$$

This ratio-based method relied on the fundamental assumption that the average proportionality established during the historical period remained a stable and accurate predictor of the relationship between the two time series during the forecast horizon.

Appendix E: *Defining a protectionist index*

A major challenge was identifying a protectionism index capable of capturing the recent intensification in the use of sanctions and other protectionist measures, such as tariffs.

Before reviewing the different metrics considered, it is crucial to note that the distinction between sanctions and other protectionist measures has become increasingly difficult to make. Sanctions are technically punitive actions adopted by a country or body against another to enforce compliance with specific norms or conventions, such as promoting human rights, combating terrorism, or resolving armed conflicts. In contrast, commercial tariffs and duties are traditionally aimed at defending a state's national economic interests. Ideally, there should be a clear difference between these tools based on their

purpose. However, in recent decades, there has been a significant overlap between sanctions policy and traditional protectionism, with tariffs often used for sanction-like purposes and vice versa. As a result, it is now extremely difficult to distinguish between the two. Consequently, although this analysis treated duties, tariffs, and sanctions collectively as a single, broad category of protectionist tools, the protectionism index ultimately selected for this study focused exclusively on the annual count of sanctions introduced by the sample countries.

The initial indicator of protectionism (*PI1*) evaluated was the complement of the KOF Globalisation Index (*KOFGI*), a measure of economic, social, and political globalization provided by the KOF Swiss Economic Institute. Since *KOFGI* served as a proxy for a country's openness to trade, it was hypothesized that its complement could serve as an approximation of protectionist barriers. However, as demonstrated in Figure 7 by the data for the United States⁸ between 1998 and 2022, this measure failed to adequately capture the observed rise in protectionism over recent decades. For the U.S., the metric remained nearly constant, decreasing slightly from approximately 24 in 1998 to 20 in 2022. This discrepancy necessitated the development of a more sensitive measure.

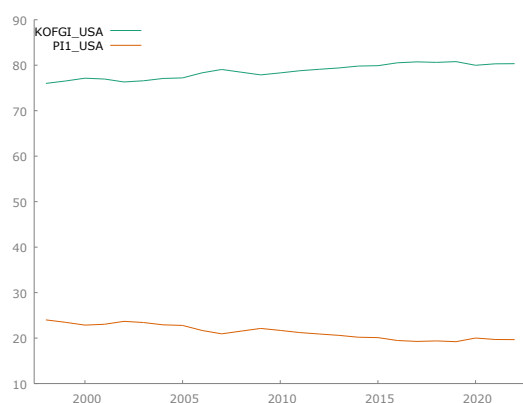


Figure 5. Trend of *KOFGI* and *PI1* for the United States between 1998 and 2022. Source: author's elaboration.

The index ultimately chosen for the analysis, which replaced *PI1* was constructed by aggregating data from the Global Sanctions Data Base (GSDB). Specifically, the total number of sanctions in force by each country against other nations was calculated on a year-by-year basis from 1998 to 2023. This indicator, named *PI*, effectively captured the increasing use of sanctions over the past two decades, as illustrated in Figure 8. The

sanctions included in this index belonged to various categories, ranging from military and commercial to financial and travel-related restrictions. To better reflect the temporal variation in the use of each type of sanction, *PI* was disaggregated into six sub-indices, also represented in Figure 8 for the United States.

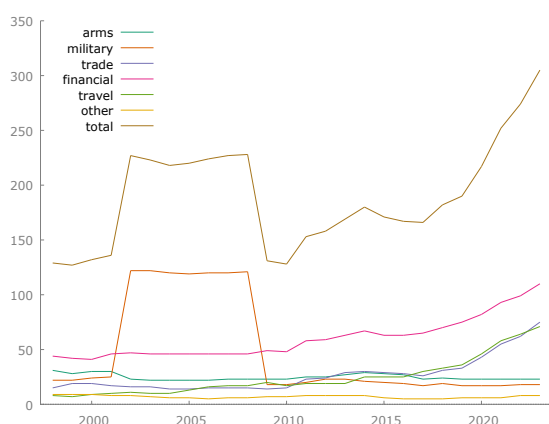


Figure 6. Trend of U.S. sanctions by type and total between 1998 and 2023. Source: author's elaboration.

The resulting data aligned with the policy shifts observed during successive U.S. administrations. The Obama administration (2009–2016) initially emphasized financial sanctions before expanding into restrictions on the movement of people. The Trump administration (2017–2020) primarily implemented commercial measures, while the Biden administration (2021–2025) exhibited a different trend, including the suspension of certain commercial sanctions. Furthermore, the unusual spike in military sanctions between 2001 and 2009 was directly tied to the geopolitical response to the events of September 11, 2001, and the subsequent “War on Terror” during the George W. Bush presidency. These shifts were accurately reflected in the *PI* fluctuations, validating its use as a robust proxy for protectionist intensity.

Appendix F: Descriptive analysis of historical series

As is standard practice, a descriptive analysis of the time series for the variables was performed prior to their inclusion in the models to evaluate whether empirical trends aligned with the proposed theoretical framework. For this illustrative analysis, variables were considered at their level for the United States, China, and the four-country aggregated debtors and creditor groups⁹.

Regarding *NC*, a predominant downward trend was observed across all jurisdictions from 1998 to 2019, extending to *NCSII* and *NCSII2* series. This was consistent with the findings of Brancaccio, Giammetti, Lopreite, and Puliga (2018), suggesting a systemic increase in capital centralization, as a decrease in *NC* signifies a reduction in the number of entities controlling global capital. The trend for debtor countries was influenced by a moderate downward tendency in France and, similar to the U.S. series, was affected by the structural shock of the Great Recession, which led to a restructuring of ownership networks. By the end of the period, *NC* values were significantly lower than initial levels: China decreased from 0.132 to 0.005 (-96.5%), the United States from 0.027 to 0.003 (-89.1%), the creditor group from 0.042 to 0.015 (-64.5%), the debtor group from 0.018 to 0.007 (-61.7%), and the global value from 0.019 to 0.007 (-61.5%). Notably, while the United States and debtor countries maintained lower average *NC* values, China and the creditor countries experienced the greatest percentage decrease. Finally, the NC^{WLD} plummeted following the 2007–2008 financial crisis, indicating an acceleration in the process of capital centralization.

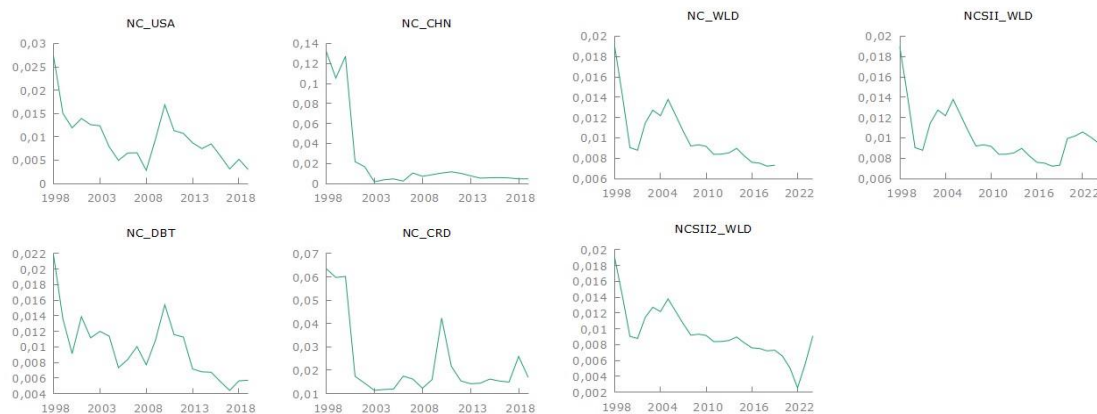


Figure 7. Trend of *NC*, *NCSII* and *NCSII2* between 1998 and 2019. Source: author's elaboration.

The *NIIP* data revealed a stark divergence between blocs. From 1998 to 2023, creditor nations led by China maintained a growing surplus of financial assets over liabilities, whereas debtor nations, primarily the United States, saw their positions worsen significantly. In absolute terms, the U.S. deficit expanded from approximately \$1 trillion in 1998 to \$20 trillion in 2023 (+1739%), while China's surplus surged from \$1 billion in 1998 to nearly \$3 trillion in 2023 (+234918%). Over the same period, the absolute balance

of debtor countries grew from \$1.4 trillion to \$23 trillion (+1531%), while that of creditor countries went from almost \$90 billion to \$8 trillion in just 23 years (+8845%). While the current positions of the United States and debtor countries are more critical than those of China and creditor countries, it is important to note that the percentage change in the *NIIP* over this period was greater for the latter group.

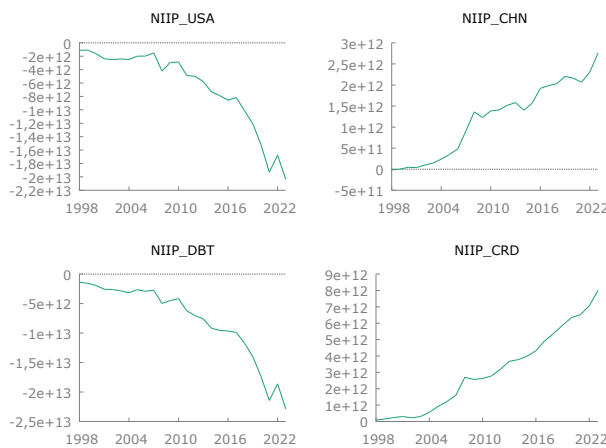


Figure 8. Trend of the *NIIP* between 1998 and 2023. Source: author's elaboration.

The analysis of the *PI* between 1998 and 2023 uncovered a consistent increase in the use of sanctions across all scenarios. By 2023, the United States had adopted 305 sanctions, significantly exceeding China's 125. Concurrently, debtor nations implemented 696 sanctions, surpassing the 531 sanctions from creditor nations. However, creditor nations – and China in particular – have been rapidly closing this gap. China's average number of annual sanctions rose from approximately 55 before 2021 to 124 between 2021 and 2023. The distinctive spike in U.S. sanctions observed between 2001 and 2009 was directly attributable to military restrictions linked to the “War on Terror”.

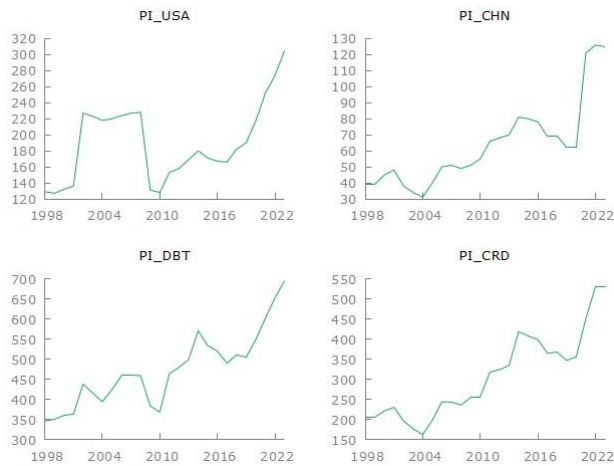


Figure 9. Trend of the PI between 1998 and 2022. Source: author's elaboration.

Similarly, *ME* and *MEPC* increased between 1998 and 2024. A striking feature was the near-exponential growth of China's military spending, which surged by 1742% over twenty years. Despite this, China's total expenditure (\$314 billion in 2021) remained lower than the U.S. figure (approximately \$997 billion). The U.S. trend exhibited a peak during the Bush Jr. administration due to Middle Eastern conflicts, followed by a reduction during the Obama administration.

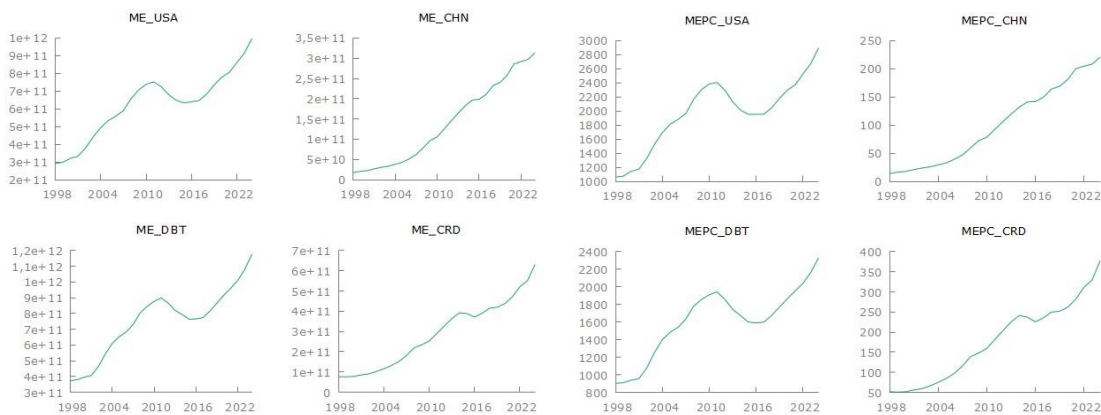


Figure 10. Trend of ME and MEPC terms between 1998 and 2024. Source: author's elaboration.

Finally, nominal *GDP* grew substantially across all cases considered between 1998 and 2024. While U.S. growth followed a relatively linear trajectory (222% increase), China's expansion was exponential (1707% growth rate). In 1998, the U.S. economy was nine times larger than China's; by 2024, this ratio had narrowed significantly, with the U.S. GDP (\$29.2 trillion) being only 1.5 times that of China (\$18.7 trillion). The *GDP* trends for

creditor and debtor nations largely mirrored the dynamics of their respective leading economies, confirming the systemic nature of these shifts.

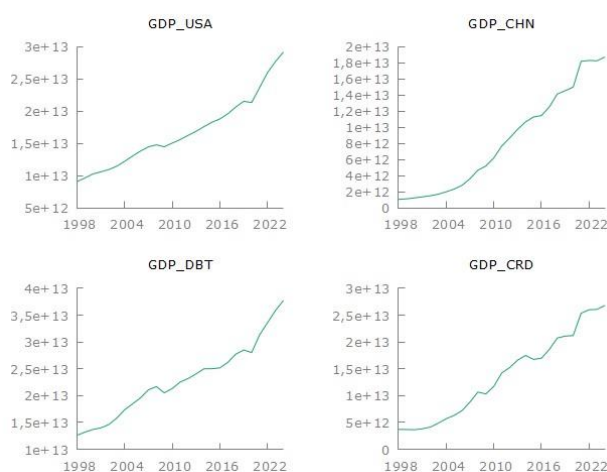


Figure 11. Trend of GDP between 1998 and 2024. Source: author's elaboration.

Appendix G: Forecast error variance decomposition (FEVD)

The following figures present the FEVD results for SVAR Models 2 and 6, focusing on the bilateral dynamics between China and the United States, and Models 2a and 6a, which examine the aggregate relationships between creditor and debtor blocs. This analysis is essential for quantifying the relative contribution of each exogenous shock to the forecast error variance of the endogenous variables. By isolating the variance shares, these results provide empirical verification of the causal links identified in the study.

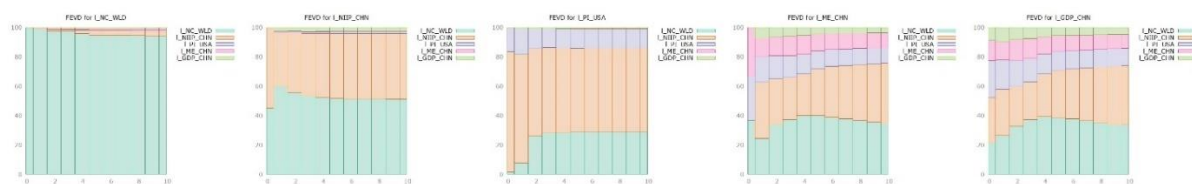


Figure 12. U.S.-China Model 2: FEVD of NC^{WLD} , Chinese NIIP, U.S. PI, Chinese ME, and Chinese GDP. Source: author's elaboration.

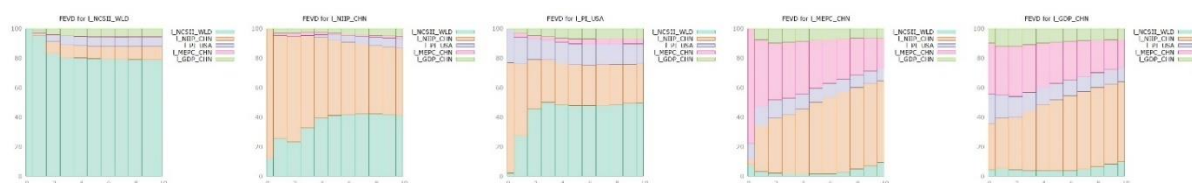


Figure 13. U.S.-China Model 6: FEVD of $NCSII^{WLD}$, Chinese NIIP, U.S. PI, Chinese MEPC, and Chinese GDP. Source: author's elaboration.

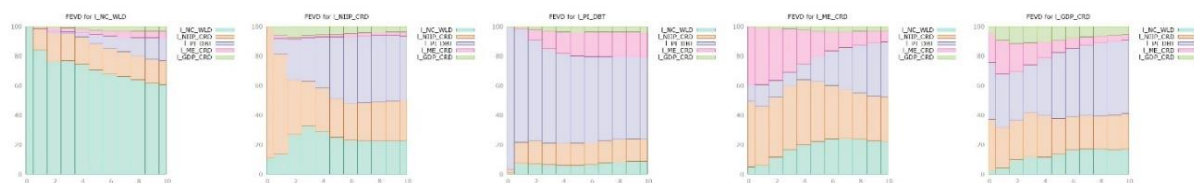


Figure 14. Creditors-Debtors Model 2a: FEVD of NC^{WLD} , creditors' NIIP, debtors' PI, creditors' ME, and creditors' GDP. Source: author's elaboration.

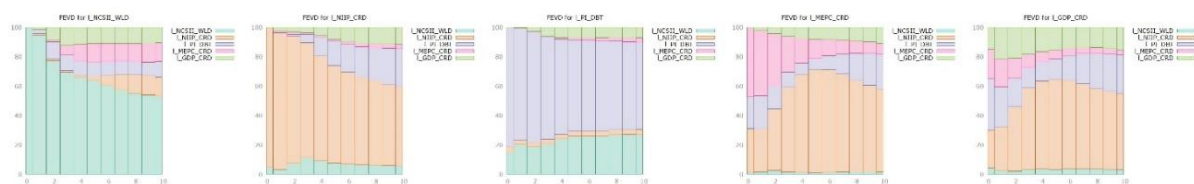


Figure 15. Creditors-Debtors Model 6a: FEVD of $NCSII^{WLD}$, creditors' NIIP, debtors' PI, creditors' MEPC, and creditors' GDP. Source: author's elaboration.



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² In the renewable energy sector, China achieved dominance in solar panel production by transitioning from initial joint ventures with Western partners to the direct acquisition of their shares – a strategy subsequently mirrored in the field of AI (Ghorbani, 2025). Furthermore, major creditors intensified their presence in Africa to secure rare earth minerals, gaining a significant competitive advantage in microchip production through rapid, low-cost access to these essential resources (Zhang 2024, Nantulya, 2025). This economic assertiveness was further complemented by a strategic pursuit of international human capital. The September 2025 launch of the K-visa, for instance, targets foreign STEM professionals with a streamlined process that waives local employer sponsorship. Often labeled “China’s H-1B”, the K-visa’s introduction was strategically timed to coincide with the U.S. administration’s decision to increase H-1B application fees (The Economist, 2025). This policy juxtaposition highlights Beijing’s calculated effort to capitalize on American contraction, positioning China to displace the U.S. as the global leader in technological expertise.

³ However, this executive overreach triggered a significant constitutional crisis. On August 29, 2025, a U.S. appeals court ruled these tariffs an illegal exercise of presidential power, concluding that the International Emergency Economic Powers Act (IEEPA) does not grant the president the authority to impose tariffs – a power strictly reserved for Congress. In February 2026, the Supreme Court affirmed this ruling, forcing the administration to terminate the executive orders. Despite this judicial setback, the administration has since pivoted toward alternative legal mechanisms, such as Section 122 of the Trade Act of 1974, to sustain its protectionist agenda. This provision allows a president to impose tariffs of up to 15% for 150 days to address “large and serious balance-of-payments deficits”. However, this “Plan B” met a similar fate on May 7, 2026, when the U.S. Court of International Trade (CIT) ruled the new tariffs “unauthorized by law”. The court’s decision hinged on a critical distinction raised by business plaintiffs: a standard trade deficit is not legally synonymous with a balance-of-payments crisis. By attempting to use a narrow emergency tool to fix a structural trade imbalance, the court found the administration had once again exceeded its statutory mandate. Ultimately, these measures have acted as a double-edged sword: while intended to secure American hegemony, they have instead prompted China to accelerate its supply chain independence and deepened the resolve of the non-aligned bloc (Jin, 2024).

⁴ This alternative order is now crystallizing through the BRICS+ group, which has expanded to include Egypt, Ethiopia, Iran, and the UAE, representing 30% of global GDP. In direct response to Western sanctions and Russia’s disconnection from the SWIFT system, Beijing has spearheaded the BRICS Cross-Border Payment Initiative (BCBPI) as a functional alternative to dollar-led infrastructure, such as SWIFT. By promoting true multilateralism at the 2025 Shanghai Cooperation Organization (SCO) summit, China has advanced a multipolar strategy specifically designed to erode American hegemony and establish a financial framework independent of Western oversight.

⁵ It should be noted that non-seasonally adjusted nominal GDP was used because real GDP data in U.S. dollars was not consistently available for all countries in the sample.

⁶ “The use of the levels specification not only avoids the unit root issue. It also avoids the controversial issue of which cointegration restrictions to impose in estimation” (Kilian & Lütkepohl, 2016).

⁷ To ensure a stable distribution, the first 1,000 Markov Chain Monte Carlo (MCMC) samples were discarded as a “burn-in” period. The remaining 9,000 samples were then used to calculate the impulse response functions (IRFs). This ensures the impulse response functions (IRFs) are calculated from a stable distribution.

⁸ The United States was chosen as an example due to its prominent role in implementing protectionist policies in recent decades.

⁹ The five-country groups show the same trend for all variables considered.