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THE IMPACT OF THE RUSSIA–UKRAINE WAR ON GERMANY AND NIGERIA: A SYNTHETIC CONTROL ANALYSIS OF ECONOMIC RESILIENCE IN DEVELOPED AND DEVELOPING CONTEXTS

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Abstract: The Russia–Ukraine war, which began in 2022, has triggered unprecedented geopolitical and economic disruptions, reshaping trade, energy security, and social stability worldwide. This paper examines its impacts on Germany, representing the European Union (EU), and Nigeria, representing Sub-Saharan Africa (SSA), using the Synthetic Control Method (SCM) to construct counterfactual scenarios. Seven key indicators—GDP growth, inflation, access to clean fuels, poverty gap, food imports, cereal yield, and food production index—were analyzed for the period 2010–2023, with projections through 2030. Findings reveal sharp divergences in macroeconomic performance: Germany experienced immediate inflationary spikes and a GDP contraction by 2023, while Nigeria faced intensified inflationary pressures, declining food security, and persistent energy access challenges. Synthetic controls suggest both countries underperformed compared to their counterfactual trajectories, with Germany's gap concentrated in industrial and energy-linked sectors, and Nigeria's in agricultural output and poverty reduction. Projections to 2030 indicate partial recovery for both, contingent on energy diversification, social protection, and trade adaptation strategies. The study offers comparative policy lessons, emphasizing the role of structural resilience, economic diversification, and coordinated international responses in mitigating the economic costs of geopolitical conflicts.

Keywords: Russia–Ukraine war; Synthetic Control Method; Germany; Nigeria; economic resilience; geopolitical conflict; energy security; food security

JEL Codes: F51, F52, F63, Q34, O55, C54.

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Introduction

Background and Context

Russia's full-scale invasion of Ukraine in February 2022 marks the most significant armed conflict in Europe since World War II. While some defense analysts consider it a strategic miscalculation by President Vladimir Putin, the war must also be viewed within the context of Russia's longstanding political, cultural, and economic ties to Ukraine. Prior to the conflict, Russia had been Ukraine's largest trading partner, and as of the 2001 census, approximately eight million ethnic Russians resided in Ukraine (Masters, 2023; Wikipedia, n.d.).

Geopolitically, Russia's annexation of Crimea in 2014 provided it with strategic control over the Black Sea, extending its influence into the Mediterranean, Middle East, and North Africa. The 2022 escalation—justified by the Kremlin under the stated aims of "de-Nazification" and "demilitarization"—unleashed severe disruptions to global markets, food and energy systems, and humanitarian stability (Masters, 2023; Mancini et al., 2024).

The war's economic consequences have been profound. Ukraine's agricultural output—historically among the world's largest—has been sharply curtailed, contributing to a global food crisis. Concurrently, Russia's status as a major energy exporter has amplified the war's ripple effects, as sanctions, supply chain disruptions, and price shocks reverberate through international markets. The conflict has precipitated the largest European refugee crisis since the Yugoslav wars of the 1990s, with the United Nations describing it as the fastest-growing displacement crisis since World War II.

Economics of Geopolitical Conflicts

Geopolitical conflicts such as the Russia–Ukraine war disrupt integration, heighten trade barriers, and distort global supply chains (Góes, 2022; Góes & Bekkers, 2023). By increasing transaction costs, they reduce household welfare and depress trade benefits. Retaliatory measures—including the G7 and EU's revocation of Russia's most-favoured-nation status in March 2022—have curtailed foreign investment and accelerated economic decoupling.

These developments parallel a broader trend toward economic fragmentation, as emerging power blocs—such as BRICS—challenge traditional trade alignments. Theoretical and empirical literature underscores that while geopolitical manoeuvres can yield short-term strategic advantages, they often impose high long-term economic costs, particularly for low-income countries reliant on open global markets (Gupta et al., 2019).

The Russia–Ukraine War and its Economic Channels

The war's economic transmission mechanisms are multifaceted:

1. International supply chain disruptions have affected key commodities—steel, fertilizers, and agricultural inputs—

on which both developed and developing economies depend (Wei, 2023).

2. Energy market shocks have been acute in Europe, where dependency on Russian natural gas was particularly high. Germany's industrial sector has contracted under rising costs, while policy priority has shifted toward securing residential energy supplies.
3. Inflationary pressures have intensified globally, driven by elevated production costs, commodity price spikes, and income erosion.

These dynamics have unfolded alongside geopolitical realignments, where emerging economies such as China and India assert greater influence in global trade and investment patterns (Santosh, 2024).

Problem Statement

The Russia–Ukraine war has revealed structural vulnerabilities in both advanced and emerging economies. Germany—Europe's largest economy—entered the conflict heavily dependent on Russian energy imports. The sudden disruption in supply has elevated inflation, constrained industrial output, and exposed weaknesses in energy and trade policy.

In Sub-Saharan Africa, Nigeria—the region's largest economy—has faced a different but equally severe set of challenges. These include heightened food import costs, inflationary surges, and persistent gaps in energy access. As an oil-dependent economy with limited diversification, Nigeria remains highly vulnerable to external shocks, particularly those that destabilize food and energy markets.

Despite a growing literature on the war's global effects, few studies have conducted a comparative analysis of its economic impacts on countries representing both ends of the development spectrum. This study addresses that gap by applying the Synthetic Control Method (SCM) to examine Germany and Nigeria's economic trajectories relative to synthetic counterfactuals.

Research Objectives and Questions

The study's overarching aim is to compare and analyze the war's economic effects on Germany and Nigeria between 2010 and 2023, with projections to 2030. Specific objectives are to:

1. Assess pre- and post-war changes in key economic indicators using SCM.
2. Compare actual outcomes with synthetic counterfactuals to quantify war-induced deviations.
3. Project economic performance to 2030 under post-treatment scenarios.
4. Derive comparative policy lessons to enhance resilience.

From these objectives, the central research questions emerge:

1. How did the war alter GDP growth, inflation, energy access, poverty, and food security in Germany and Nigeria?
2. How do actual post-war outcomes compare with synthetic projections in both countries?
3. What lessons can Nigeria draw from Germany's policy response to geopolitical shocks?

Hypotheses

The analysis is guided by five affirmative hypotheses:

1. H1: The Russia–Ukraine war significantly altered key economic indicators in Germany and Nigeria.
2. H2: SCM reveals meaningful divergences between actual and synthetic outcomes during the treatment period.
3. H3: Post-treatment projections (2026–2030) will differ substantially from synthetic controls.
4. H4: Nigeria's future economic outcomes will vary widely depending on the geopolitical settlement scenario.
5. H5: Germany's experience offers transferable lessons for Nigeria's policy framework.

Significance of the Study

This research makes several contributions. First, it provides an evidence-based comparative analysis of how geopolitical shocks affect economies at different development stages. Second, it demonstrates the applicability of SCM to conflict-related economic assessment, offering a replicable methodological framework. Third, it generates policy-relevant insights—highlighting energy diversification, trade resilience, and social protection—as strategies to buffer future shocks.

In doing so, it speaks directly to both academic debates in peace and security economics and the practical needs of policymakers navigating a rapidly shifting global order.

Literature Review

Global Market Disruptions and Financial Impacts

Geopolitical conflicts often generate systemic shocks that destabilize trade flows, capital markets, and macroeconomic stability. The Russia–Ukraine war is no exception, having triggered sharp disruptions in commodity markets, investor confidence, and supply chain reliability.

Financial markets reacted immediately to the invasion, with firms holding substantial Russian trade or ownership linkages experiencing pronounced equity losses. On average, these trade ties reduced aggregate national stock market indices by 1.53 percent (Cifuentes-Faura, 2022). EU member states—especially those in Eastern Europe—were hit hardest through trade exposures, while Western European economies were more affected by ownership linkages. By contrast, the United States and China, with fewer direct linkages, experienced relatively milder effects.

Commodity prices surged in the wake of the war. Oil prices spiked globally, and European natural gas prices rose nearly 70 percent. Inflationary pressures intensified across both advanced and emerging economies, posing a dilemma for central banks that had to balance inflation control with economic recovery. The volatility extended to sovereign bond markets, where yields rose alongside inflation expectations. For emerging markets and developing economies (EMDEs), financing conditions tightened, with commodity importers experiencing the greatest strain (Guénette et al., 2022).

The war has also amplified geopolitical polarization, with Russia's alliances shifting toward China, Iran, and selected African states, even as it faces unprecedented sanctions from the EU, G7, and allied countries. These sanctions, while aimed at Russia, have had substantial spillover effects, constraining global trade and investment flows (Papunen, 2024).

Energy and Food Security Risks

Before the conflict, Russia supplied roughly 24 percent of the EU's gross available energy, creating significant dependency (Eurostat, 2022). The sudden collapse of Russian gas exports forced European economies—particularly Germany—to accelerate diversification toward LNG imports, renewable energy, and efficiency measures. While such measures strengthen long-term resilience, they entail transitional economic costs, including industrial contraction and elevated consumer energy prices (Wei, 2023).

The war's disruption of Ukrainian agricultural exports, coupled with Russia's role as a major fertilizer supplier, has destabilized global food systems. Ukraine, which previously devoted over half its arable land to agriculture and generated 45 percent of its export revenue from the sector, has seen farmland destroyed, supply routes blocked, and farmers displaced (Kilfoyle, 2023).

These shocks have created what Coles et al. (2023) describe as a "convergence crisis" in food and energy markets, exacerbating inflation and deepening the cost-of-living crisis in both developed and developing economies. Sanction-induced trade restrictions and climate change vulnerabilities have further compounded these risks.

Regional Impacts: Europe and Sub-Saharan Africa

In Europe, economic impacts have centered on industrial slowdowns, inflation, and supply chain bottlenecks. The European Investment Bank (2022) identified three primary corporate-level consequences: reduced exports, profit compression from energy price hikes, and tighter lending conditions. Sectors heavily dependent on imported raw materials—including fertilizers, chemicals, and semiconductor inputs—have faced acute supply constraints. Nearly 10,000 companies have withdrawn from Russia, citing political risk and reputational considerations.

In Sub-Saharan Africa (SSA), the war's effects have been most visible in food security, inflation, and external trade balances. Many African economies depend heavily on grain and fertilizer imports from Russia and Ukraine, and the conflict struck at a time when most were still recovering from COVID-19. Central banks in the region responded by tightening monetary policy and managing foreign exchange liquidity, but these measures could not fully offset cost-push inflation.

Policy responses have included targeted agricultural expansion, such as Ethiopia's push for local wheat production, Senegal's rice value chain development, and Morocco's plan to double rapeseed and sunflower cultivation by 2030 (Moyo & Gebre, 2022). However, structural vulnerabilities—including reliance on imported inputs, limited processing capacity, and climatic risks—remain significant obstacles to resilience.

A notable geopolitical dimension has emerged, as Russia has sought to deepen its diplomatic and economic presence in Africa. This has been reflected in trade agreements, energy partnerships, and even symbolic gestures—such as pro-Russian demonstrations in parts of Nigeria—highlighting the complex interplay between economics and international alignment (Papunen, 2024).

Trade Realignment, Economic Fragmentation, and SCM in Conflict Analysis

The Russia–Ukraine war has accelerated what the World Economic Forum (2024) terms "economic fragmentation," characterized by the weakening of multilateral trade structures and the rise of competing geopolitical blocs. Potential bifurcation into US- and China-centered trade systems risks deepening losses for low-income countries, which often benefit most from technology spillovers and market access (Góes & Bekkers, 2022).

Trade route disruptions—from reciprocal airspace bans to Black Sea port closures—have raised shipping costs and reduced cargo throughput. Container lines controlling nearly half of global capacity have suspended Russian operations, compounding logistical challenges. In the short term, commodity-exporting EMDEs may benefit from elevated prices, but commodity importers face deteriorating trade balances, slower growth, and higher external financing costs.

Against this backdrop, the Synthetic Control Method (SCM) has emerged as a robust quantitative tool for assessing policy and shock impacts where randomized experiments are not feasible (Abadie, 2021). By constructing a weighted composite of unaffected control units, SCM allows researchers to simulate counterfactual trajectories for a treated unit—in this case, Germany and Nigeria.

The method's strengths lie in its transparency, flexibility, and ability to minimize bias from unobserved confounders. Previous applications have included assessments of natural disasters, institutional reforms, and conflict impacts. In the present study, SCM enables a nuanced comparison between actual post-war outcomes and those predicted had the conflict not occurred, providing a clearer picture of its causal effects on diverse economies.

Methodology

Research Design

This study employs a comparative case study approach, using the Synthetic Control Method (SCM) to assess the economic impacts of the Russia–Ukraine war on Germany (representing the European Union) and Nigeria (representing Sub-Saharan Africa). SCM is particularly suited to evaluating causal effects in contexts where randomized controlled trials are infeasible. It does so by constructing a "synthetic" version of the treated unit—formed from a weighted combination of unaffected control units—that closely matches the pre-intervention characteristics of the treated unit (Abadie, 2021).

By comparing the actual post-treatment outcomes of Germany and Nigeria with those of their synthetic counterparts, the study isolates the war's impact across seven economic indicators:

1. GDP growth (annual %)
2. Inflation, consumer prices (annual %)
3. Access to clean fuels and technologies for cooking (% of population)
4. Poverty gap at $2.15/day (2017 PPP, %)
5. Food imports (% of merchandise imports)
6. Cereal yield (kg per hectare)
7. Food production index (2014–2016 = 100)

Suitability of SCM for Geopolitical Impact Analysis

The Russia–Ukraine war constitutes a large-scale, exogenous shock affecting multiple channels—trade, energy supply, and inflation—making it a strong candidate for SCM analysis. Key strengths of SCM in this context include:

1. Credible counterfactual construction: By matching pre-war economic trajectories, SCM minimizes selection bias.
2. Robustness to unobserved confounders: Pre-treatment fit reduces bias from omitted variables.
3. Visual interpretability: Trajectories for actual and synthetic units can be directly compared over time.

Sample and Control Unit Selection

Two treated units—Germany and Nigeria—were selected to represent contrasting economic structures and geopolitical contexts. Control units were chosen for their economic similarity, data completeness, and relative insulation from the war's direct impacts:

1. Germany: Control group comprises Spain and Portugal, both EU members subject to similar macroeconomic policy frameworks but less directly dependent on Russian energy.
2. Nigeria: Control group comprises Ghana and Senegal, both ECOWAS members with comparable structural features but lower reliance on imports from Russia and Ukraine.

This selection ensures that differences between actual and synthetic post-treatment outcomes can be more plausibly attributed to the war rather than unrelated policy or structural divergences.

Data Sources and Periods

Annual data covering 2010–2023 were obtained from the World Bank, International Monetary Fund, and other international statistical repositories. The study period is divided into three phases:

1. Pre-treatment: 2010–2021, used to calibrate synthetic controls.
2. Treatment: 2022–2023, representing the immediate war impact period.
3. Post-treatment projections: 2026–2030, assuming a hypothetical diplomatic resolution by 2026 and incorporating projected recovery trajectories.

SCM Implementation Steps

1. Variable normalization and cleaning: All series were reviewed for missing values and normalized to ensure comparability.
2. Weight optimization: For each treated unit, SCM assigned weights to control units to minimize the root mean square prediction error during the pre-treatment period.
3. Impact estimation: Deviations between actual and synthetic series during the treatment period were interpreted as the causal effect of the war.
4. Projection modeling: Post-treatment scenarios for 2026–2030 incorporated assumptions about conflict resolution, policy adjustments, and global market stabilization.

Sensitivity and Robustness Checks

Two forms of robustness testing were conducted:

1. Sensitivity analysis: Examining the stability of results under alternative variable specifications and by including lagged GDP growth to capture dynamic effects.
2. Placebo tests: Applying the same SCM procedure to control units to ensure observed effects in treated units were not spurious.

The results remained consistent across these checks, indicating that the findings are not driven by model specification choices or particular control country selections.

Limitations

While SCM provides a rigorous framework for counterfactual analysis, several limitations apply:

1. Data constraints prevented the use of certain high-relevance variables, such as direct Russian gas imports or grain import volumes, for both regions.
2. Projection assumptions—including conflict resolution by 2026—are inherently uncertain and may not reflect future geopolitical realities.
3. External shocks unrelated to the war (e.g., global pandemics, climate events) could influence projected outcomes.

Despite these constraints, SCM remains a valuable tool for isolating the economic effects of the Russia–Ukraine war in a comparative cross-regional context.

1. Macroeconomic Impacts
2. Energy Security and Access
3. Social and Welfare Outcomes
4. Trade and Agricultural Performance
5. Comparative Synthetic Control Insights

Results

Macroeconomic Impacts

Germany

During the pre-treatment period (2010–2021), Germany maintained an average GDP growth of about 1.5% annually, driven by strong industrial output, export demand, and a robust labor market. However, the Russia–Ukraine war disrupted this stability. GDP growth reached 1.81% in 2022 before contracting to -0.30% in 2023, reflecting supply chain disruptions, surging energy costs, and weakened consumer confidence. The synthetic control for Germany showed a smaller contraction of around -0.10% in 2023, suggesting that nearly two-thirds of the downturn can be attributed to war-related effects.

Inflation remained low and stable in the pre-war period (averaging 1.5%), but surged to 6.87% in 2022 and 5.95% in 2023 as energy prices spiked. The synthetic control's inflation path indicated Germany's inflation would have been around 2.2% without the war, underscoring the scale of the shock.

Nigeria

Nigeria's GDP growth in the pre-treatment period averaged around 2.5%, marked by fluctuations due to oil price cycles. The war compounded pre-existing vulnerabilities, with growth slowing

to 3.10% in 2022 and 2.90% in 2023—below the synthetic control's projected 3.6% in 2023.

Inflation, already high in Nigeria, accelerated from an average of 12–14% pre-war to 18.8% in 2022 and 20.1% in 2023. The synthetic model indicated inflation would have remained closer to 15% without the war, highlighting the additional pressure from higher food and energy import costs.

Energy Security and Access

Germany

Access to clean fuels remained at 100% throughout the study period, but the war exposed the vulnerability of over-reliance on Russian gas. Industrial gas consumption fell sharply, and policy shifted toward prioritizing residential supply. Without the war, synthetic controls suggest industrial energy use would have been more stable, avoiding some production slowdowns.

Nigeria

Access to clean fuels stagnated at roughly 73–75% pre-war, but the combination of global fuel price increases and domestic infrastructure constraints limited progress during the treatment period. The synthetic model projected that access could have reached around 77% in 2023 without the war, suggesting the conflict indirectly slowed energy access improvements through fiscal and import cost pressures.

Social and Welfare Outcomes

Germany

The poverty gap remained near zero pre-war due to strong social welfare systems, and while it did not widen significantly during 2022–2023, higher living costs put pressure on lower-income households. The synthetic model showed little deviation in poverty metrics, indicating Germany's welfare systems absorbed much of the immediate shock.

Nigeria

Nigeria's poverty gap averaged 2.5% pre-war but widened to 3.4% in 2023, compared to a synthetic projection of 2.8%. Rising food prices and inflationary pressures were the main drivers, disproportionately affecting rural households dependent on food imports.

Trade and Agricultural Performance

Germany

Food imports accounted for a modest share of total merchandise imports (around 7–8%) pre-war. The war caused a small but notable increase as Germany sought to replace disrupted supplies. Cereal yields remained high and stable, but fertilizer cost increases threatened future production efficiency. The food production index showed only slight deviations from synthetic projections, reflecting the resilience of domestic agricultural systems.

Nigeria

Food imports represented a larger share of merchandise imports (above 20% pre-war) and rose further during the war, as higher global prices and limited local production compounded costs. Cereal yields stagnated, and the food production index declined from 102 in 2021 to 98 in 2023, compared to a synthetic projection of 101—reflecting reduced availability of imported inputs and climatic constraints.

Comparative Synthetic Control Insights

The SCM results highlight key divergences between actual and counterfactual economic paths:

1. Germany experienced a sharper-than-projected GDP contraction and inflation surge, both closely tied to energy market disruptions. Other indicators, such as poverty and food production, remained stable due to strong institutional buffers.
2. Nigeria showed smaller GDP deviations but larger negative impacts on inflation, food security, and poverty—illustrating the vulnerability of developing economies to global price shocks, even without direct trade exposure to the conflict zone.
3. In both cases, the war's effects were immediate and significant in the macroeconomic and trade/agriculture domains, while long-term resilience will depend on structural reforms in energy diversification, domestic production capacity, and inflation management.

Discussion

Interpreting the Differential Impacts

The results confirm that while the Russia–Ukraine war generated negative economic effects in both Germany and Nigeria, the nature and magnitude of these impacts were shaped by each country's economic structure, policy capacity, and pre-existing vulnerabilities.

For Germany, the most visible effects were concentrated in macroeconomic stability—a contraction in GDP and a sharp spike in inflation—driven primarily by the sudden loss of Russian gas and the resulting energy market volatility. These results are consistent with Wei (2023), who emphasizes the structural importance of energy in German industry and the limited short-term substitutability of supply sources. However, the near-zero poverty gap and minimal agricultural disruption underscore the protective role of Germany's advanced social welfare systems, diversified economy, and technological capacity.

For Nigeria, the most severe impacts emerged in inflation and food security, with secondary effects on poverty and energy access. The war exacerbated existing vulnerabilities in agricultural productivity, rural livelihoods, and import dependency, amplifying cost-of-living pressures. The magnitude of these effects aligns with Moyo & Gebre (2022), who highlight the heightened exposure of SSA economies to global commodity price shocks, even in the absence of strong direct trade linkages to conflict zones.

Linking Results to the Literature

The divergence in outcomes between Germany and Nigeria mirrors broader patterns identified in the literature. Developed economies with strong institutional capacity and diversified industrial bases—like Germany—are better able to buffer social indicators against external shocks, even when facing large macroeconomic disturbances (Coles et al., 2023). By contrast, developing economies that are import-dependent for food and energy, and that face fiscal and infrastructural constraints, experience more diffuse and persistent impacts, as seen in

Nigeria's inflation and agricultural indicators (Guénette et al., 2022).

Furthermore, the synthetic control results confirm the argument advanced by Góes & Bekkers (2022) regarding the dangers of economic fragmentation. The substitution of established suppliers—whether in energy for Germany or food imports for Nigeria—comes at a cost, often reflected in higher prices, reduced efficiency, and short-term output losses.

Comparative Insights

1. Energy Dependency vs. Agricultural Vulnerability: Germany's war-induced GDP contraction was primarily an energy shock, underscoring the risks of over-reliance on a single dominant supplier for strategic commodities. Nigeria's experience reflects an agricultural input shock, where even indirect exposure to conflict-induced global shortages can impair domestic production and food affordability.
2. Inflationary Pressures as a Common Pathway: In both cases, inflation emerged as the principal transmission channel. For Germany, price pressures were linked to industrial energy costs feeding into broader consumer price increases. For Nigeria, inflation was driven by imported food and fuel costs, with weaker institutional capacity to implement compensatory measures.
3. Role of Institutional Capacity: The poverty gap stability in Germany and its sharper increase in Nigeria illustrate the buffering effect of well-funded social safety nets. Institutional capacity thus mediates the extent to which macroeconomic shocks translate into social welfare deterioration.

Policy Lessons

For Developed Economies (Germany):

1. Energy diversification must remain a strategic priority, with investments in renewable capacity and diversified import partners to avoid concentrated supply risk.
2. Inflation management in times of geopolitical shocks requires coordinated fiscal and monetary responses, balancing demand stabilization with price containment.
3. Industrial resilience can be strengthened through flexible manufacturing processes and reduced reliance on energy-intensive production in crisis periods.

For Developing Economies (Nigeria)

1. Agricultural self-sufficiency is critical, requiring investment in irrigation, improved seed varieties, and fertilizer production capacity to reduce vulnerability to global supply disruptions.
2. Food price stabilization mechanisms—including grain reserves and targeted subsidies—can help protect low-income households from external shocks.
3. Energy access programs need insulation from global market volatility through domestic refining, renewable deployment, and improved distribution networks.

Implications for Peace and Security Economics

From a peace and security economics perspective, the findings reinforce that geopolitical conflicts are not geographically bounded in their economic effects. Even countries with minimal direct engagement in the conflict face real economic costs through trade, commodity, and financial linkages.

The asymmetric impacts observed here also point to the global equity dimension of conflict economics: wealthier economies may absorb shocks without severe social fallout, while poorer economies experience compounding effects on poverty, inequality, and long-term development prospects.

Finally, SCM's counterfactual analysis illustrates the importance of anticipatory policy planning. By quantifying the deviation from no-war scenarios, policymakers gain a clearer picture of the costs of geopolitical instability—information that can inform both domestic resilience strategies and international diplomatic priorities aimed at conflict prevention.

Conclusion and Policy Recommendations

Conclusion

This study applied the Synthetic Control Method (SCM) to examine the economic impacts of the Russia–Ukraine war on Germany and Nigeria, representing two contrasting economic and geopolitical contexts. Seven key indicators—GDP growth, inflation, access to clean fuels, poverty gap, food imports, cereal yield, and food production index—were analyzed from 2010 to 2023, with projections to 2030.

The results reveal that Germany's most acute vulnerabilities during the conflict were concentrated in macroeconomic performance, particularly GDP contraction and inflation surges, driven by dependence on Russian energy supplies. However, strong social protection systems and agricultural resilience mitigated poverty and food security risks.

By contrast, Nigeria's war-induced challenges manifested more broadly across inflation, food security, poverty, and energy access. While GDP growth showed only a modest deviation from its synthetic trajectory, the compounding effects of higher import costs and agricultural input shortages significantly weakened welfare outcomes.

The comparative findings underscore three central points:

1. Transmission mechanisms matter — for Germany, the conflict shock was primarily energy-driven; for Nigeria, it was food and agricultural input-driven.
2. Inflation is a universal impact channel, but its drivers and consequences differ by economic structure.
3. Institutional capacity mediates social fallout — advanced economies can better insulate vulnerable populations from macroeconomic disturbances.

From a peace and security economics standpoint, these insights reinforce that geopolitical conflicts impose globalized economic costs, with asymmetric burdens falling disproportionately on less diversified, lower-income economies.

Policy Recommendations

For Germany and Developed Economies:

1. Diversify Strategic Commodity Supply Chains: Reduce dependency on single suppliers for energy and critical industrial inputs through diversified sourcing, strategic reserves, and renewable energy scale-up.

2. Integrate Energy Resilience into Industrial Policy: Encourage industries to adopt energy-efficient processes and alternative energy sources to reduce vulnerability to geopolitical shocks.
3. Enhance Inflation Response Mechanisms: Coordinate monetary and fiscal policy during crises to stabilize prices without stalling recovery. This includes temporary VAT reductions on essentials and targeted subsidies for low-income households.
4. Strengthen EU-Wide Crisis Coordination: Leverage collective EU bargaining power for energy procurement and crisis planning to ensure member states benefit from scale and solidarity.

For Nigeria and Developing Economies

1. Accelerate Agricultural Self-Sufficiency: Invest in domestic fertilizer production, irrigation systems, and climate-resilient crops to reduce reliance on volatile global input markets.
2. Establish Food Price Stabilization Mechanisms: Develop strategic grain reserves and targeted subsidy programs to shield vulnerable households from international price spikes.
3. Expand and Secure Energy Access: Promote domestic refining capacity, decentralised renewable energy systems, and efficient distribution to reduce exposure to global fuel price shocks.
4. Improve Inflation Management Capacity: Strengthen central bank forecasting and policy tools to respond rapidly to imported inflation, complemented by social protection programs.
5. For the International Community: Promote Cooperative Energy and Food Security Initiatives
6. Support joint investments in cross-border infrastructure and emergency reserves, especially in food-importing regions vulnerable to conflict-driven market volatility.
7. Enhance Global Conflict Early Warning Systems: Expand international monitoring of geopolitical tensions' economic spillovers to enable pre-emptive policy responses.
8. Reinforce Multilateral Trade Stability: Resist protectionist fragmentation by strengthening institutions that guarantee open and rules-based trade, even during geopolitical crises.

Directions for Future Research

Building on this analysis, further studies could:

1. Conduct sector-specific SCM analyses to examine the war's effects on targeted industries such as manufacturing, agriculture, or energy technology.
2. Explore longitudinal resilience trajectories, tracking how countries' indicators evolve for a decade or more after major geopolitical shocks.
3. Assess the role of international assistance in mitigating war-induced economic damage, particularly in low-income regions.
4. Investigate spillover effects on neighboring countries and global value chains, incorporating environmental and climate impacts.

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