

U.S. Sanctions Effects on Russia's Macroeconomic Variables and Businesses' Decisions to Stay or Leave: What Did We Learn?

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Abstract

The U.S. has imposed several sanctions on Russia's economy since 2014 mainly due to the war against Ukraine, which has affected not only its macroeconomic variables, but several businesses' decisions to trade with Russia. Despite the severity of the amends on the violations, several western businesses continue to trade with Russia and have stayed in the country. Interestingly, some of European and American companies are still operating in Russia despite the sanctions and threats to their businesses. The question that remains to be answered is what are the factors that affect businesses' decisions to adhere or decline the U.S. sanctions? Those drivers are important from the geopolitical perspective as they can neutralize the adverse effects of sanctions on Russia's economy.

The goal of this paper is twofold. First, we analyze the effects of sanctions on macroeconomic variables second, we try to shed lights on the drivers of businesses' decisions to stay in or leave Russia at the micro level. Using a Tobit model, we relate businesses' decisions to variables such as property rights, corruption perception index, Global Sanction Index (GSI), and Global Militarization Index (GMI) in the origin country to find out whether those are important variables in their decisions.

Keywords

Corruption perception index, geopolitical conflict, global militarization index (GMI), global sanction index (GSI), Tobit model, yuanization.

JEL Classification : P0, P2, F5, E0, E6.

INTRODUCTION

According to the official data, the January-July 2023 oil and gas revenues for Russia has declined substantially by 41.4 % compared with similar period of the previous year. In addition, the weaker ruble has hit the purchasing power of the middle-class because they must spend more on necessities. However, the weaker ruble helps the government with its budget, given that it earns more ruble for every dollar of earnings from oil and other products it sells. This trend has led to an increase in military spending and on social programs that help consumers and firms transforming to a war economy blunting the impacts of sanctions on Russia.

The goal of this paper is twofold. At the macro level, we try to find out whether the U.S. sanctions have affected Russia's GDP growth, FDI, inflation, and trade balance. And at the micro level, since some U.S. and western companies are still working in Russia we try to find out about their incentives; what factors are driving their decisions to stay in Russia. One of the novel features of this study is that it not only considers the macroeconomic effects of sanctions but also investigates the forces that drive decisions of firms to stay in Russia despite the imposed sanctions.

LITERATURE REVIEW

A considerable amount of empirical studies have estimated the effects of sanctions on Russia's macroeconomic variables. In February 2022, US, European Union, Canada,

Australia, Japan, and other western nations imposed crippling new sanctions on Russia. In this section we briefly review some of the empirical studies that have measured the effects of sanctions on Russia's economy as well as on imposing countries.

A study on the long-run effects of sanctions on Russian economy based on a balanced growth model shows that sanctions led to a significant decline in the consumption. The study finds Russian long-run consumption felt by 8.5% and the average real wages felt by 4.8% due to the sanctions [1].

The U.S. sanctions have complicated cross border payments for the Russian economy. However, Russia has been resilient to the sanctions compared to the 2007-09 financial crisis. The reasons for this resilience are (i) transition to a war economy, leading to increased military production. (ii) coalition with emerging economies including China, Brazil, Turkey, India, and Saudi Arabia (iii) concerns about global energy crisis have persuaded the U.S. and its allies to stop restriction on Russia's energy trade worldwide. However, there is speculation that the rise in interest rates conducted by the central bank of Russia may lead to bankruptcy across many businesses [2].

On the other hand, a study carried out on the effects of sanctions on Germany due to cutting Russian energy imports finds that in the short run sanctions have led to an output loss of 0.5 to 3% of GDP [3].

In the meantime, Russia's GDP growth has declined from 3.5% in 2023 to 1.5% in 2024. Though the EU exports to Russia have declined to 2% of pre-war levels, China, Turkey

and CIS countries have become vital suppliers to Russia, counterfeiting the adverse effects of sanctions on Russian economy [4].

Though sanctions have created substantial costs for Russia, their effectiveness were limited due to integration of Russia into the global commodity market. The integration of Russia commodities market into China, Turkey, and UAE has helped the country to reduce the adverse effects of imposed sanctions by western countries [5].

An empirical study shows that sanctions have led to 67% decrease in agricultural trade between Russia and its trading partners. Indeed, the negative impacts of EU sanctions on Russia are stronger in trade of labor-intensive products. Overall, most producers and consumers have lost, and the largest losses have been for countries with substantial trade volumes of agricultural products with Russia [6].

Sanctions have had negative effects on Russia's exports and imports. Russian imports has decreased by 10.85% and exports dropped by 13%. The negative impact on Russia's imports of agricultural products has been larger than other sectors [7].

Revenues from oil and gas remain lower in 2023 than in 2022, but still higher than pre-war average. Indeed, the western sanctions have had partial effect in achieving the desired outcome of collapsing the Russian economy as Russia has access to western goods through supply chain from China and some former Soviet Union states [8].

The increase in imports from countries that hadn't sanctioned Russia substituted between 10 % to 25 % of missing imports from sanctioning countries in the last quarter of 2022. Though the total drop in EU exports to Russia in the fourth quarter of 2022 was about \$7.5 billion, 10% of this missing export has been substituted by third countries supply chain to Russia [9].

Another study on the effects of the U.S. sanctions on Russian economy finds that Russian GDP growth felt by 2.1% in 2022; however, sanctions have changed Russian trade partners. Russia has also imposed capital controls, returning to yuanization of payments and militarization of budget. Indeed, Russian economy stayed resilient to the sanctions as ties with new allies including Iran, Turkey, United Arab Emirates, Myanmar and African countries helped Russia to remain afloat [10].

The extent of circumvention of sanctions is hard to document as more sanctions are imposed the more efforts are made by Russia and its allies to mitigate the adverse effects of sanctions on its trade. Such barriers increase the cost of doing business, but it is not an uncommon practice in Middle East and Central Asia where businesses have learned the art of turning around the sanctions for half of a century. Russia had the ability to offset the adverse impacts of sanctions through diversifying its resources by turning to former Soviet Union countries including Azerbaijan, Armenia, and Belarus. [11].

In addition, the Central Bank prompt response with measures such as the rise in interest rate to avoid capital flight

has softened the adverse effects of war and sanctions on Russia's economy. However, the consumer price index has increased by 14 %, leading to a significant decline in the average purchasing power of Russian households [12].

From the micro viewpoint, sanctions have led to significant decline in revenues and asset values of sanctioned firms compared to other firms. As a matter of fact, under sanctions, strategic firms systematically outperform non-strategic firms [13].

Sanctions have led to a significant decrease in the trade flow between the sender and the targeted country; however, the threat of sanctions may lead to an increase in the trade flow due to the existence of agents and hidden activities in both countries to minimize the adverse outcomes [14].

In fact, Russian economic performance has been weak since 2011-2012, but how much of this disappointing performance can be attributed to the sanctions, is a question that remains to be answered. The oil price decline in 2015-16 exacerbated Russia's exports and its economy. In addition, the foreign funding of Russian banks has been substantially affected by the sanctions. In sum, sanctions have worked both through foreign trade and financing. However, the sanctions were also costly to the western countries. While Russia lost \$54 billion dollars in exports, western countries lost \$42 billion in exports to Russia [15].

Though after three years of war with Ukraine, the sanctions effects may seem to be piecemeal as trade with third countries have limited their impacts, the spread and depth of sanctions covering Russia's financial sector; the removal of Russia from SWIFT; and the new rules on goods and services in strategic sectors have changed the trajectory of Russia's GDP growth and purchasing power of Russian households. Indeed, Russian GDP is now 10-12% below pre-invasion trend and personal disposable income is 20-25% below pre-war level [16].

A more recent study on the impacts of sanctions on firm's performance in Russia at the micro level indicate that sanctions affect performance of firms in non-energy sectors. The study finds decreased sensitivity to cash flows under the impact of foreign sanctions. [17].

RESEARCH QUESTIONS

Several studies have analyzed the effects of sanctions on Russia by looking into a limited period or through qualitative analysis. One of the novel features of this study is that it captures the effects of sanctions on Russia's economy through regression models covering a long period of time (from 2000-2022). More importantly, it analyzes the effects of sanctions at the microeconomic level and implements variables that have not been previously used in the literature, including property rights, corruption perception index, global sanction index (GSI) and global militarization index (GMI).

Indeed, this research study attempts to respond to the following questions:

1. What are the effects of sanctions on macroeconomic variables of Russia, including GDP growth, foreign

direct investment (FDI), inflation, and trade balance?

2. Is there any relationship between property rights index of the origin country that the firm belong to and the decision of firms to stay in or leave Russia?
3. Is there any relationship between global sanction index (GSI) and decisions of firms remaining or leaving Russia?
4. Does corruption perception index (Corrupt) of the origin country affect businesses' decisions to stay in or leave Russia?
5. Does global militarization index (GMI) of the origin country affect businesses' decisions to stay in or leave Russia?

DATA AND METHODOLOGY

The data on annual GDP growth of Russia since 2000 indicates that financial crisis in 2009 has had a more severe impact on the growth compared to imposed sanctions since 2014. As it is seen in Figure 1, the GDP growth in 2009 had declined by 7.8%, while after sanctions in 2015 it confronts with -1.9% decrease; and more importantly in 2023 and 2024 it had a growth of 4 and 4.3%, respectively, indicating that the sanctions really had no significant impact on the GDP growth.

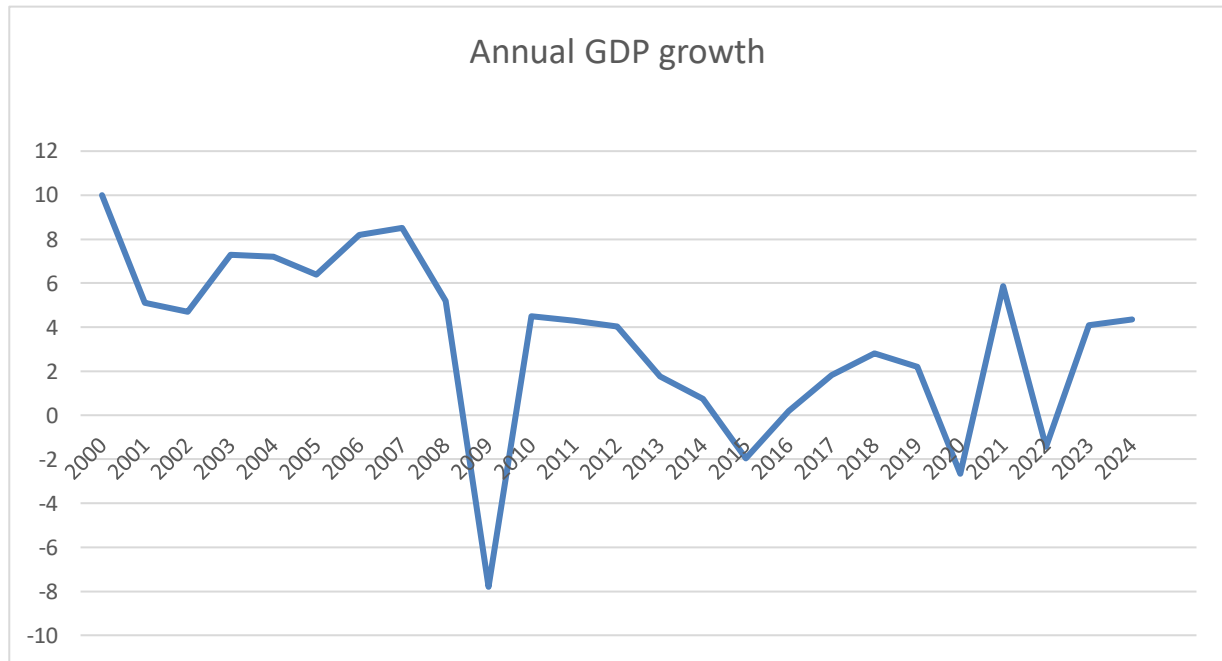


Figure 1. Annual GDP growth of Russia at Constant Prices

Source: World Bank, Data Indicators <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=RU>

To estimate the effects of sanction, we use macroeconomic data to find out how sanctions have affected macroeconomic variables such as GDP, FDI, inflation, and trade balance. We implement regression models and ordinary least squared (OLS) techniques with data over the period 2000-2022 to analyze the effects of sanctions on the abovementioned variables. A dummy variable is used to predict the effects of sanctions on macroeconomic variables.

Indeed, the study estimates the effects of U.S. sanctions on Russia's macroeconomic variables through the following regression models (Equations 1 through 4) used by the author in another study [18]. The effects of sanctions are measured through a dummy variable (the years that sanctions have been imposed will be equal to 1, and for the rest of the period the dummy will be equal to zero).

$$GDP = a_0 + a_1 Openness + a_2 Population + a_3 FDI + a_4 Inflation + a_5 M2 + a_6 Dummy \quad (1)$$

$$FDI = a_0 + a_1 Openness + a_2 Population + a_3 Interest + a_4 Inflation + a_5 Tax + a_6 Dummy \quad (2)$$

$$CPI = a_0 + a_1 M2 + a_2 CPI_{(-1)} + a_3 Debt + a_4 E + a_5 Dummy \quad (3)$$

$$Trade = a_0 + a_1 GDP + a_2 Per capita Inc + a_3 Openness + a_4 MS + a_5 Inflation + a_5 Exchange + a_6 Dummy \quad (4)$$

How do the firms react to the imposed sanctions at the micro level? Several studies have focused on this subject. The most recent study uses a fixed effects model and finds that imposing new sanctions significantly lowered the possibility of firms serving the sanctioned markets, while lifting the sanctions on countries such as Cuba and Myanmar had no or small effect. Additionally, the effects of sanctions are heterogenous along the firms. Firms that are dependent on trade finance instruments are significantly affected by sanctions, while prior experience in the sanctioned country significantly mitigate the blow of sanctions [19].

At the micro level we use a Tobit model to see whether firms' decision is affected by GDP growth, debt to GDP, property rights, corruption perception index, global sanction index, and global militarization index. The reason we have chosen those variables is that they affect the resistance of the

sanctioned country. A recent study at university of Drexel by Gammadigbe [20] emphasizes the multilateral resistance term of sanctioned countries. The resistance term is affected by global militarization index and corruption level. In addition, several empirical studies including Keerati [21] have used debt to GDP as one of the independent variables in regression models to capture the effects of sanctions at the micro level (Equation 5).

Indeed, in the Tobit model if the firm stays in Russia, the dependent variable is equal to one and if it leaves Russia, it will be equal to zero. The list of variables, their definitions, and data sources are provided in Table 1.

$$\text{Firms' decision} = a_0 + a_1 \text{GDP} + a_2 \text{Debt} + a_3 \text{Property} + a_4 \text{Corruption} + a_5 \text{GSI} + a_6 \text{GMI} \quad (5)$$

Table 1. List of Variables, Definitions, and Data Sources

Variable	Definition	Source
GDP	GDP growth in real term	International Monetary Fund
Openness	Ratio of imports plus exports to GDP	International Monetary Fund
Population	Number of individuals living in Russia	Macro Trends
FDI	Foreign Direct Investment	CEIC Data
Inflation	CPI inflation rate at constant prices	Federal Reserve Bank of Saint Louis
M2/GDP	Ratio of money supply to GDP	Federal Reserve Bank of Saint Louis
Interest	Real interest rate	World Bank Data
Exchange	Exchange rate versus US dollar	Federal Reserve Bank of Saint Louis
Trade	Trade Deficit to GDP	International Monetary Fund
Debt	Government Debt ratio to GDP	International Monetary Fund
Property	Property Rights Index of Russia	International Property Right Index
Corruption	Corruption Perception Index	Transparency International (score)
GSI	Global Sanction Index	London School of Economics (LSE)
GMI	Global Militarization Index	Bonn International Center for Conflict Studies
Dummy	Years that sanctions have been imposed	Since 2014 equal to 1. The rest equals zero

ESTIMATED RESULTS

The macroeconomic effects of sanctions presented in Table 2 indicate that the coefficient on the dummy variable for sanctions is negative and statistically significant. In other words, sanctions have negatively affected GDP growth and foreign direct investment, while it has a positive significant effect on inflation and trade deficit. One percentage-point increase in the sanctions reduces the GDP growth and FDI by 0.24 and 0.27, respectively. While it entails a 0.02 percent increase in inflation and 0.06 percent increase in the trade deficit. The findings here are consistent with several empirical studies including [4], [10], and [12] who found negative effects of sanctions on Russia's GDP growth.

Table 2. Estimated Regression Results for GDP, FDI, CPI and Trade Deficit

Independent Variable	GDP	FDI	CPI	Trade
Constant	134 (1.12)	121 (1.34)	109 (2.18)	67 (2.45)
Openness	0.14 (2.36)	0.37 (2.96)	-	0.41 (3.16)
Population	0.05 (0.03)	0.24 (1.98)	-	-
FDI	0.04 (1.78)	-	-	-
Inflation	-0.03 (3.75)	-0.07 (1.45)	-	0.05 (2.76)
M2	0.56 (2.14)	-	0.14 (3.78)	-
Interest	-	-0.05 (1.76)	-	-
CPI (-1)	-	-	0.78 (2.89)	-
Debt	-	-	0.15 (4.16)	-
Exchange	-	-	0.24 (2.65)	0.04 (4.13)
Dummy	-0.24 (1.98)	-0.27 (2.17)	0.02 (2.34)	0.06 (4.17)
R-Squared	78%	86%	77%	81%
F-Statistics	125.17	108.23	79.36	104.59

Numbers in parentheses are (t) ratios.

At the micro level, we implement a Tobit model, where the firm's decision is a function of GDP growth, size of the economy (population), debt to GDP, property rights index, corruption perception index, global sanction index (GSI) and global militarization index (GMI). We expect that property rights have a negative impact on the decision of the firm to stay in Russia. The corruption perception index is expected to

have a positive impact to stay; and the global sanction index is expected to have a negative impact because as more global sanctions are imposed the less likely the firm will stay in the sanctioned country. Finally, the global militarization index is expected to have a positive impact on the decision of the firm to stay in Russia, as it will be more homogenous with the militarized economy in Russia.

The estimated results are presented in Table 3. Expectedly, GDP growth, and size have positive impact on the decision of the firms, while debt to GDP has a negative impact on their decision to stay in Russia. We also find that property right index, corruption perception index, GSI, and GMI are all statistically significant at 5% level.

The coefficient on corruption perception index is statistically significant and positive. In other words, firms from countries with higher level of corruption perception index are more likely to stay in Russia despite the western sanctions. Second, the estimated coefficient on property rights is negative and statistically significant. Indeed, firms from countries with higher property rights index are less likely to stay in Russia. Third, the coefficient on the global sanction index (GSI) is negative and statistically significant, indicating the higher the global sanction index, the more likely the firm will leave Russia. And finally, countries with higher global militarization index (GMI) have preferred to stay in Russia and do business despite the U.S. sanctions. These are interesting findings as they indicate firms from countries with high corruption level and militarization index, are more likely to stay in Russia, while firms from countries with high property rights and global sanction index are more likely to leave Russia.

Table 3. Estimated results for the Tobit Model of the firms' decisions

Constant	1.78 (0.01)
GDP	0.03 (0.02)
Size	0.02 (0.01)
Debt	-0.01 (0.02)
Property	-0.04 (0.01)
Corruption	0.03 (0.02)
GSI	-0.14 (0.01)
GMI	0.12 (0.01)
Number of Observations	75

P-values are reported in parentheses

DISCUSSION OF FINDINGS

Based on estimated models at the macro level, we find that sanctions negatively impact GDP growth and FDI. One percentage point increase in sanction reduces GDP and FDI by 0.24% and 0.27% respectively. However, sanctions have positive impacts on CPI inflation and trade deficit. Based on our estimated results, one percentage point increase in the sanctions increases Russia's inflation by 0.2 % and trade deficit by 0.6%, highlighting the detrimental effects of sanctions on macroeconomic variables.

At the micro level, we find that firms' decisions are affected not only by macroeconomic environment such as GDP growth and debt to GDP, but also by property rights index, corruption perception index, global sanction index (GSI) and global militarization index (GMI). The higher the property right index of the country, and the higher global sanction index, the less likely the firm will stay in Russia, while the higher the corruption perception index and the bigger global militarization index of the origin country the more likely the firm will stay in Russia, a kind of homogeneity with Russia's militarized economy.

CONCLUSIONS AND POLICY RECOMMENDATIONS

Though sanctions have negatively affected Russia's GDP growth, FDI and worsened the trade deficit, Russian economy has been relatively resilient as it has found strategies to circumvent the effects of sanctions. Russia, as a big size economy is integrated into global commodity market has been able to substitute the lost European market with Southeast Asian countries including China and India as well as with former CIS countries. The integration into emerging markets and yuanization has helped Russia to reduce the adverse effects of sanctions. As emphasized by several authors, the success of sanctions depends on the goals of signaling nations. When the goal is destabilizing, initial stability is determinant of success, while for other goals, financial sanction is the most effective instrument [22].

Though the Central Bank of Russia has increased the interest rate to avoid capital flight, the capacity to control inflation might be limited due to a fall in oil exports and foreign exchange reserves, while defense expenditures have continued to grow. Sanctions may cause more challenges for the Russian economy and its limited oil revenues despite integrating into emerging markets if they are more effectively implemented and if substitute strategies are implemented on different sectors, including the oil sector.

Indeed, Russia's revenues have not suffered substantially from the sanctions to reduce the length of the war. Russia has been able to transfer its economy to a war economy. In addition, effective monetary policy implemented by Bank of Russia has prevented emergence of financial shocks and protected its economy from plunging into a deep financial crisis [23]. Tightening oil price cap, sanctioning foreign exchange reserves, and imposing a full financial embargo can help to increase pressures on Russia's economy and bringing

Moscow to negotiations [24]. Though 300 billion euros of Russia's central bank reserves are blocked by EU, G-7 and Australia [25], more needs to be done to bring Russia into negotiations table. A recent study finds that the reduction of GDP growth is comparable to the effect of global financial crisis in 2009 [26]. Moreover, the experience of 35 sanctioned countries during 2010-2019 has shown that different types of sanctions yield different results. Several studies have shown that financial sanctions have been the most effective ones, leading to a 1.35 and 2.30 basis point decrease in GDP [27].

A recent empirical study shows a significant negative effect of sanctions on GDP, as well as on trade and foreign direct investment FDI [28]. In addition, when analyzing the effects of sanctions one should distinguish between private and government sanctions. Only 37% of the businesses in a survey think that avoiding business with Russia is a pure business decision, and 30% think that sanctions are issues for governments not private sector. However, in a geopolitical context, private firms can cut trade and business relationships due to political reasons [29]. It is also indicated that the dictator's level of power and the degree of repression are affected by the level of sanctions and by their impact on the political power of opposition groups [30].

Indeed, sanctions are just one tool, to wean Europe from its reliance on Russian gas, and to finance Ukraine's economic future, and unlocking its assets to create strategic leverage for Ukraine need to be considered as alternative strategies [31]. The corresponding MNEs' strategies through organizational theories suggest that a theoretical framework based on institutional theory can help better understand and explain the exit strategy from sanctioned countries. Indeed, institutional pressure and cultural distance affect firms' exit strategy and divestment mode [32]. Finally, an empirical study of cross-national analysis of 133 countries suggest that the type of sanction and the level of anticipated cost to the sender and the target has no significant impacts on the economic conditions of the target country. Therefore, a sanctioning country should think of more effective solutions instead of sanctions as their primary non-military strategy [33].

This study contributed to the literature as we measured the adverse effects of sanctions on Russia's macroeconomic variables; and more importantly, we investigated the effects of sanctions at the micro level on the firms' decisions to stay in or leave the sanctioned country. Based on our estimated results at the macro level, we found that sanctions have significant negative impacts on macro variables including GDP, FDI, and have worsened inflation and trade deficit. And based on our micro level Tobit model estimated results, we find the most important factors that drive businesses' decisions to stay in or leave Russia are property rights in the origin country, corruption perception index, global sanction index, and global militarization index. The higher the corruption perception index and the higher global militarization index in the origin country the more likely the firm will stay in Russia despite the sanctions imposed.

As emphasized by several scholars, sanctions are only one

tool that is not very effective for large economies such as Russia integrated into global markets, in settling down international conflicts. Therefore, it is important to evaluate sanctions versus other alternatives before implementing them in practice, because several countries have created different blocks against the western countries. Sanctions are only minor tools for resolving challenging global geopolitical conflicts; therefore, we need to think of other long-term solutions to solve geopolitical problems.

Avenues for Future Research

One way this research study could be developed in the future is to expand the sample to include a group of countries that have been sanctioned by the U.S. including Cuba, Iran, Iraq, Libya, North Korea, Syria, Sudan and Venezuela. Another alternative to improve the results and contribute to the literature is to use different techniques such as vector error correction model (VEC) and VAR models to check for robustness of our results.

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