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# ASSESSING THE EFFECTIVENESS OF ANTI-RUSSIAN ECONOMIC SANCTIONS IN A DATA-RESTRICTED CONTEXT: A REVIEW OF METHODOLOGIES AND APPROACHES

**Abstract:** This paper provides a comprehensive overview of the methodologies used to assess the effectiveness of anti-Russian economic sanctions, with a focus on the challenges and opportunities associated with the use of these methodologies. Drawing on examples from global experience and Russia's experience between 2014 and 2021, the paper examines the methods for evaluation of the impact of sanctions on the economies of target countries, particularly Russia. While various negative effects of the sanctions have been identified, some positive effects have also been found. However, in 2022, the situation changed dramatically with the expansion of military actions and the imposition of unprecedentedly harsh economic sanctions, making it impossible to apply traditional methods of assessment. The limitations of using open data are outlined, including restricted access to national data, and the reasons why traditional methods may lead to false conclusions are discussed. Despite these limitations, it can be argued that the stock market may still provide an opportunity to evaluate the effectiveness of sanctions. A variety of techniques, such as event-driven analysis and heavy-tailedness returns analysis, can help to circumvent data limitations, and the availability of quoted prices will allow for further analysis of the sanctions. This paper highlights the methodological challenges and opportunities associated with assessing the effectiveness of anti-Russian economic sanctions and provides a valuable reference for researchers, policymakers, and practitioners interested in this topic.

**Keywords:** economic sanctions, Russia, financial markets

## 1. INTRODUCTION

Economic sanctions have been a part of human history since ancient times. Some of the earliest examples include the Megarian Decree, which imposed trade restrictions by Athens against Megara in around 432 B.C. and served as one of the causes of the Peloponnesian War (Hufbauer, Schott, Elliott, & Oegg, 2009, p. 9). In more recent history, the era of the Napoleonic Wars saw a continental blockade of England, which could also be considered as economic sanctions. However, the period following the Napoleonic Wars was marked by the emergence of trade liberalization ideas that culminated in the 20th century with the establishment of agreements and organizations such as the GATT and the WTO (Smeets, 2021, p. 282). Despite these developments, the 20th century also witnessed a rapid growth in the use of economic sanctions. According to Hufbauer, Schott, Elliott, & Oegg (2008), there were over 200 cases of economic sanctions from the end of World War I until the year 2000, with a true peak of sanctions called the "sanctions decade" marking the end of the century (Cortright & Lopez, 2000).

However, even in the context of this dramatic increase in the use of sanctions worldwide, the case of Russia stands out. While the first sanctions against Russia were imposed in 2014, an unprecedented increase in the scale of sanctions

began with the expansion of military action against Ukraine in February 2022. Over the past year, the total number of economic sanctions imposed on Russia has surpassed 500 (Bown, 2023).

With such a large number and variety of economic sanctions, the question of their effectiveness inevitably arises. Evaluating the effectiveness of anti-Russian sanctions, like any other sanctions, presents several challenges for researchers. Each new sanctions case or Russian response to them may render the application of previous methods ineffective. Therefore, it is important to reconsider methodologies for evaluating previous sanctions, focusing on the current limitations of the Russian case. The next paragraph of this paper will focus on approaches to assessing the effectiveness of sanctions. The third paragraph will list examples from the history of sanctions worldwide that may share similar features with the Russian case. The fourth paragraph of this paper will provide an overview of methodologies and their applicability in the case of evaluating anti-Russian sanctions from 2022. The fifth paragraph will list the main limitations in the assessment of anti-Russian sanctions. The conclusion will present general conclusions.

## 2. PREVIOUS RESEARCH OF SANCTIONS EFFECTIVENESS

When evaluating economic sanctions, an important question arises regarding their effectiveness. The effectiveness of sanctions has traditionally been assessed by whether they achieved their officially stated objectives. If effectiveness is measured by the success in coercing the target state to take the necessary political action, economic sanctions are generally considered to be ineffective. Hufbauer et al. (2009) note that only about one-third of the imposed sanctions achieved their stated objectives. Peksen & Drury (2010) provide an even harsher estimate based on a sample from 1972-2000, stating that 65% to 95% of sanctions failed to achieve their goals and, in some cases, reduced the level of democracy in the target country. If a substantial political goal, such as regime change, is considered, sanctions may only be effective when imposed against small or unstable countries (Hufbauer & Jung, 2021). It is also believed that only the toughest sanctions, such as those imposed by the UN and binding on all participating countries, can achieve their intended effect (Neuenkirch & Neumeier, 2015).

However, the approach of assessing effectiveness based on achieving stated objectives can lead to false conclusions about ineffectiveness because it does not take into account the damage inflicted on the target country's economy. Additionally, punishment itself may be the purpose of sanctions (Hufbauer & Jung, 2021). For these reasons, recent research has shifted towards assessing the impact of sanctions on the target countries' economies (van Bergejk, 2021, p. 18). Since Russia has not abandoned its policy under the pressure of sanctions since 2022, but there have been obvious changes in its economy, this paper will further use the approach of assessing the effectiveness of sanctions in terms of their impact. Given the variety of channels through which sanctions can impact target countries (Neuenkirch & Neumeier, 2015, p. 111-113), this approach can assess the contributions of sanctions in weakening individual markets, which will be discussed in the fourth section.

Another approach to assessing effectiveness, which can be considered a modification of the previous one, is to compare the costs incurred by the sender country with the amount of damage caused to the target country. Bělín & Hanousek (2021) assessed the 2014 sanctions and counter-sanctions imposed by the EU and the U.S. on one hand, and Russia on the other, using this approach. The costs incurred by the sender country may include the weakening of its own position (Bianchi & Sosa-Padilla, 2023), as well as the damage from the counter-sanctions received as a response. In the case of the target country, not only are the lost profits from the sanctions taken into account, but also the costs incurred to protect important economic sectors and redirect trade flows (Ahn & Ludema, 2020).

## 3. PREVIOUS SANCTIONS EXPERIENCE

To select a methodology for evaluating the effectiveness of current anti-Russian sanctions, it is helpful to refer to the extensive global and Russian experience of recent years, which have similarities to the current situation.

### 3.1. Iran

One of the most interesting cases for studying economic sanctions and identifying similarities with the Russian case is Iran. Economic sanctions against Iran were in operation from 2012 to 2015 and from 2018 to the present day. The period of temporary suspension of sanctions against Iran due to the signing of the nuclear deal provides an opportunity to study the rebound effect, which is a rapid recovery of economic relationships. However, the existence of the rebound effect, generally speaking, is not supported by broader data (van Bergejk, 2021, p. 19).

Iran is an oil-producing country and is forced to produce and export oil under the conditions of the oil embargo, which presents some parallels with the Russian case. The existence of a stock exchange in Iran allows for an assessment of the impact of financial sanctions on public companies through quotes (Ghasseminejad & Jahan-Parvar 2021). The surge in the Tehran Stock Exchange TSE Index in 2018 (Mazarei, 2018) proved to be a bailout for domestic investors amid the devaluation of the national currency. Russian investors can see this as a hope for their market (Shumkin, 2023).

## 3.2. South Africa

The second example in world history that may provide an analogy for the Russian case is the sanctions against the apartheid regime in South Africa. The country first came under UN sanctions during the 1960s, but the toughest sanctions came into effect in 1986. There was a complete ban on financial and economic relations for Western European and North American companies. The sanctions lasted until 1994 and ended with the change of the political regime. As a result of the sanctions, the trade turnover decreased by one third (Evenett, 2002). However, it cannot be said that the change in the political course was a direct consequence of the economic sanctions (Levy, 1999).

The economy of South Africa during the sanctions period has several similarities to the current Russian economy. The South African economy depended on the export of natural resources, which influenced the exchange rate of the national currency. Successful prices for South Africa's main export resource, gold, provided the country with a temporary surplus in its trade balance and appreciation of the rand, which hurt the main exporters. South Africa also demonstrated the first successful cases of sanctions-busting (Early, 2009) by changing trade routes and using intermediaries. Another parallel to the Russian story is the gradual withdrawal of Western companies from South Africa under external social pressure and the threat of boycott (Teoh, Welch & Wazzan, 1999).

## 3.3. Russia, 2014-2021

Russia itself has substantial experience with the operation of its economy under sanctions. Dovbnya (2020) highlights eight sanctions announcements between April 2014 and April 2018 that had a significant impact on publicly traded Russian companies. During this time, Russia experienced a number of shocks, such as a drop in the ruble, export and import restrictions, and was also forced to spend substantial resources to protect state-sensitive industries and state-owned banks (Ahn & Ludema, 2020).

## 3.4. Other Examples

All of the previous examples represent the functioning of economies under sanctions, but without the impact of prolonged hostilities. Meanwhile, there are works in the academic literature on separating the impact of armed conflicts and sanctions. For example, Lamotte (2012) looks at sanctions against Yugoslavia in 1991-2001, and finds that economic sanctions had a greater impact on international trade than armed conflicts.

Despite the fact that, on the one hand, protectionist measures are not usually classified as economic sanctions (Morgan, Bapat & Kobayashi, 2021, P.45), on the other hand, there is an opinion that U.S. trade wars with Mexico and China, initiated under President Donald Trump, carry sanctions rhetoric (Hufbauer & Jung, 2021, p. 29). Regardless of the classification of trade wars, it is possible to borrow their methodology for assessing the effectiveness of economic sanctions.

All of the listed cases of economic sanctions present opportunities to consider methods for evaluating them, which is the focus of the following paragraph.

# 4. FINANCIAL MARKETS AND ESTIMATION METHODS

## 4.1. International Trade

One of the primary targets of economic sanctions is a country's international trade. In addition to the obvious reduction in budget revenues, sanctions can lead to increased trade costs, exclusion from high-tech markets, loss of sales markets, and an expanded shadow economy (Neuenkirch & Neumeier, 2015). The trade balance, as well as exports and imports individually, are estimated using a gravity model of trade. For example, Afesorgbor (2019) compares the effectiveness of sanctions and the threat of sanctions using the gravity model. Evenett (2002) uses the gravity model, using South Africa as an example, to show that international trade does not return to pre-sanctions levels for seven years after the lifting of sanctions. Nguyen & Do (2021) estimate the decline in exports and imports in Russia after the imposition of sanctions using the difference-in-difference estimation and the gravity model based on a sample from 2011-2018.

Other methods for estimating the impact of sanctions on international trade exist that are not related to the gravity model. Fedorova, Musienko, Demin, Fedorov, & Afanasyev (2019) investigate the effect of news reports on foreign trade volume. Itskhoki & Mukhin (2022) analyze simultaneous sanctions on exports and imports, which have an opposing effect on the national currency, thus stabilizing the exchange rate.

## 4.2. The Exchange Rate

The exchange rate of the national currency during sanctions is a simple and common indicator of sanctions' effectiveness, which is always in the center of attention of the media and policymakers. For instance, Joe Biden's

comparison of the ruble to rubble (the White House, 2022) is still fresh in memory. Therefore, it is not surprising that researchers in the field of sanctions turn to the exchange rate. Bossman, Gubareva & Teplova (2023) compare how geopolitical risks affect the exchange rates of eight national currencies using nonparametric regression analysis. Dreger, Kholodilin, Ulbricht & Fidrmuc (2016) use cointegrated vector autoregression (VAR) models to determine the impact of other markets on the ruble exchange rate. The authors conclude that the falling price of oil had the most significant impact on the exchange rate in Russia after 2014. There are other works on economic sanctions associated with commodity prices and, in particular, oil prices.

## 4.3. The Oil Market

Vatansever (2020) provides an overview of Russian policies from 2014-2019 in response to smart sanctions against the oil sector. The study analyzes Russia's attempts to tweak the tax regime, change the organizational structure of the oil industry, and reinforce investment in capital expenditures, demonstrating the strengths and weaknesses of the Russian oil industry. Kuzmina, Parhomchuk, & Minakova (2020) analyze Russian oil companies' financial performance before full-scale sanctions were imposed, using databases of state statistical agencies such as the Ministry of Economic Development. Babina, Hilgenstock, Itskhoki, Mironov & Ribakova (2023) use the Russian customs dataset to assess the impact of two types of sanctions: the oil embargo and the price ceiling imposition. Dizaji & van Bergeijk (2013) apply the VAR approach followed by variance decomposition, demonstrating that sanctions on the Iranian oil sector have a significant impact on the most important macroeconomic variables only in the first two years after the imposition of sanctions.

## 4.4. The Banking System

The stability of the target country's banking system is a crucial aspect to assess the effects of economic sanctions. Hatipoglu & Peksen (2016) show through a logit regression analysis of 125 countries from 1970 to 2005 that economic sanctions increase the probability of a systemic banking crisis. Financial sanctions, in particular, have a more substantial impact on the banking system than trade sanctions. Mazarei (2019) examines the Iranian banking system to identify factors that could cause a financial crisis and explains why bank runs have not occurred so far. However, other negative impacts on the banking sector under sanctions include higher illiquidity, increased provisions for inefficient loan portfolios, and rising government capital (Pak & Kretzschmar, 2016). To benchmark the performance of sanctioned and non-sanctioned banks, Dizaji (2021) employs the Stochastic Frontier Analysis (SFA) to analyze Iranian banks from 2006-2018, finding a decrease in their cost efficiency.

## 4.5. The Stock Market

The stock market, if present in the target country, provides several possibilities to analyze the effectiveness of sanctions. First of all, it is possible to analyze asset prices themselves or their returns as indicators of negative news (Hoffmann & Neuenkirch, 2017). Event-driven analysis can be applied to investigate the short-term impact (up to two weeks) of negative news, such as the announcement of sanctions. Dovbnya (2020) applies this method to the 2014-2018 anti-Russian sanctions, and Ghasseminejad & Jahan-Parvar (2021) to the anti-Iranian ones. The variance of returns after sanctions is another indicator that can be estimated using stock market quotes. Ankudinov, Ibragimov & Lebedev (2017) find through hourly data from 2010-2016 an increase in the variance of returns after sanctions and the weighting of the tails of the post-sanctions return distribution. Factor models can be used to assess the stock market under sanctions. Nivorozhkin & Castagneto-Gissey (2018) use CAPM based on MSCI indices to estimate how the Russian stock market decoupled from the global market after 2014, finding that Russian assets can no longer provide investors with additional portfolio diversification.

## 4.6. Cross-Market Effects

The examples of research mentioned above show that it is possible to analyze the effect of sanctions on one financial market. However, financial markets are significantly interconnected, and critical changes in one market are inevitably reflected in other markets. For instance, if an economy heavily depends on the export of natural resources, the price of the main export commodity will unavoidably affect the exchange rate of the national currency, and it, in turn, will affect the rest of foreign trade.

There are methodologies available to assess contagion effect between markets and to determine which market is the first domino knuckle in a comprehensive crisis. The first such methodology is the family of generalized autoregressive conditional heteroskedasticity (GARCH) models, which are used to assess the impact of sanctions on various financial markets. For example, Sultonov (2020) uses the exponential GARCH on daily logarithmic returns to analyze the short-term relationships and volatility between the anti-Russian sanctions after 2014, the ruble exchange rate, the oil price, and the RTS stock index.

The second class of models that can be used to identify dependencies between markets under sanctions is wavelet coherence analysis (WCA). The method, which comes from physics, specifically from branches such as diffusion theory and signal processing, allows the study of the relationship between time series at different frequencies. Agyei (2023) uses a family of WCA models to analyze the effects of geopolitical risks on emerging market stocks, including Russia. Szczygielski, Charteris & Obojska (2022) use WCA to analyze the relationship between commodity markets, stock market volatility, and Google search trends at different frequencies. Samadi, Owjimehr & Halafi (2021) analyze the rial exchange rate, gold price, and oil price, TSE index from 2014 to 2020 using WCA, and compare the effects of sanctions to the contribution of the COVID-19 epidemic on financial variables. The authors also point out an advantage of the WCA method compared to GARCH: the method can indicate the significance of the correlation between variables at any point of observation (Samadi et al., 2021, p. 44).

# 5. RESTRICTIONS AFTER 2022

Despite the severity of the sanctions imposed between 2014 and 2021, Russia remained a participant in the global financial system. Researchers had the opportunity to rely on statistics from non-governmental organizations and international financial companies or rating agencies, as well as various stock indices from MSCI, Bloomberg, and IHS-Markit. Additionally, statistics on Russia's foreign trade and balance of payments were also readily available.

In 2022, the situation changed dramatically with the expansion of military actions and the imposition of unprecedentedly harsh economic sanctions. As a result, it became impossible to apply the old methods of assessment.

Access to national data on exports and imports was temporarily restricted by the head of the Federal Customs Service of the Russian Federation in April 2022 (Vedomosti, 2022), limiting the use of gravitational trade models.

On 10 March 2022, the Central Bank of Russia (CBR) introduced a temporary ban for non-resident businesses to receive cash in certain foreign currencies including US dollars and euros (Press Service of the Central Bank of Russia [CBR], 2022b). Another non-market restriction which affected the strengthening of the ruble exchange rate has been imposed before the previous one on 28 February 2022, when the CBR banned brokers "from selling securities at instructions of non-residents" (CBR, 2022c). Therefore, it is cautiously safe to say that the ruble exchange rate is no longer subject to market laws due to restrictions on the purchase and withdrawal of foreign currency.

The oil market has also experienced significant changes that may affect the credibility of studies analyzing the effectiveness of the Russian oil price cap. Vakulenko (2022) draws attention to changes in the trade routes of Russian oil and, as a consequence, changes in the pricing of its transportation. Despite this, the prices of Urals FOB Primorsk and FOB Novorossiysk, used in the analysis of the effectiveness of the anti-Russian sanctions, continue to be published by international agencies based on an outdated methodology. Therefore, the change in pricing of Russian oil and the reorientation of exports towards underground sales makes any analysis of Russian oil revenues, as well as analysis of volatility spillovers between commodity and financial markets, impossible.

On 6 March 2022, the CBR announced that Russian banks are no longer required to fully publish their financial statements, which are issued in accordance with Russian accounting standards, starting from February 2022 (CBR, 2022a). The CBR did not specify a date when this obligation would be reinstated. The absence of commercial banks' and some public joint-stock companies' quarterly profit and loss statements closes the door to the SFA based on bank reports (cf. in Dizaji, 2021) as well as other types of analysis of the Russian banking sector.

The Russian stock market represented by the Moscow Exchange has also been impacted by regulatory restrictions, resulting in international investors losing the ability to sell their shares in Russian public companies in open markets or directly to other investors. Several restrictions also applied to local investors. On 28 February 2022, the CBR decided not to start trading sessions in the Moscow Stock Exchange equity market (CBR, 2022d). Since then, the ban was renewed by the CBR on a daily basis. Only on 18 March 2022, the CBR took the first step towards lifting the ban on trading sessions in the equity market by announcing the resumption of federal government bond trading. This decision came into effect on 21 March 2022 (CBR, 2022e). Due to the sanctions, as well as the decision of private companies, international rating agencies left Russia, and the country was excluded from the calculation of global and emerging market indices. This made it impossible to use world indices as market returns in factor models.

Despite this limitation, it seems that the stock market may still provide the best opportunity to evaluate the effectiveness of sanctions. A variety of techniques, such as event-driven analysis (Dovbnya, 2020) and heavy-tailedness returns analysis, can help to circumvent data limitations. The availability of quoted prices, with the exception of a single month of trading that was closed in the spring of 2022, will allow for an analysis of the sanctions and determination of those that had no effect and which ones caused the most significant damage.

# 6. CONCLUSION

This paper provides a comprehensive overview of the methodologies used to assess the effectiveness of anti-Russian economic sanctions since 2022, with a focus on the challenges and opportunities associated with the use of these methodologies. The historical overview and analysis of previous sanctions experiences provided valuable insights into the effectiveness of different types of sanctions. The examination of various financial markets and estimation methods

demonstrated the potential for analyzing the impact of sanctions on different sectors of the economy. The limitations and opportunities associated with using these methods were also discussed.

The limitations of using open data were outlined, including restricted access to national data, and the reasons why traditional methods may lead to false conclusions were discussed. Despite these limitations, the stock market may still provide the best opportunity to evaluate the effectiveness of sanctions.

This paper serves as a valuable reference for researchers, policymakers, and practitioners interested in the topic of anti-Russian economic sanctions. The challenges and opportunities highlighted in this paper can inform future research and policy decisions related to sanctions and their effectiveness.

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