

# Dancing with the bear: The impact of sanctions on Russian trade

Group L: Muthomi Gichaara and Shahzad Gitay

## Non-technical summary

Economic sanctions are increasingly being used as a tool of modern diplomacy. They are a set of economic penalties imposed by one or more countries against another and act as an alternative to military force to further foreign policy objectives. Despite their potential, sanctions face several limitations. For example:

- Sanctions may prove costly for a sanctioning country as supply chain disruptions and access to fewer goods drive prices higher; and
- Sanctions may prove ineffective if a sanctioned country can offset a decline in trade with one country by trading more with a non-sanctioning country.

Existing research has broadly shown that sanctions have an adverse impact on trade. However, less research has been done on the dynamic effects of sanctions on trade overtime. Therefore, our research is novel in exploring this relationship with specific reference to Russia from 2003 to 2022.

Whilst sanctions generally reduce trade, studies have found some instances where they have increased trade. This includes when sanctions are threatened, as individuals begin stockpiling goods in case sanctions are imposed and they are no longer able to access the good they want. Similarly, some sanctioned countries pivot towards non-sanctioning countries and begin trading more with them. These consequences can offset the negative effects of sanctions and ultimately undermine their effectiveness, which may harm a country's ability to achieve its foreign policy goals.

Our model investigates the impact of sanctions on imports from Russia by two groups of countries: i) "Hostile" sanctioning countries; and ii) "Friendly" non-sanctioning countries.

We find:

- In the short term, sanctions have a limited impact on imports from non-sanctioning countries, whereas they have a negative impact on imports from sanctioning countries.
- In the medium to long term, surprisingly, sanctions have a negative impact on imports from non-sanctioning countries. This could be because non-sanctioning countries do not want to seem supportive of the sanctioned country, especially if the non-sanctioning countries rely on sanctioning countries for other things such as aid.
- In the medium to long term, sanctions have a greater negative effect than the short term on imports from sanctioning countries. This could happen as sanctioning countries are able to divert more of their trade away from the sanctioned country to other countries.
- Sanctions appear to have less of an effect on imports of fuel, though we cannot say for sure. This could be because fuel is an essential good and it is difficult for some countries to store, meaning countries may be less inclined to stop importing it.
- Surprisingly, we do not observe an increase in imports from sanctioning countries following the threat of sanctions. Similarly, we do not observe an increase in imports by non-sanctioning countries, following the implementation of sanctions. There could be several reasons for this, including this being an emerging trend between trade partners, or limitations with our model.

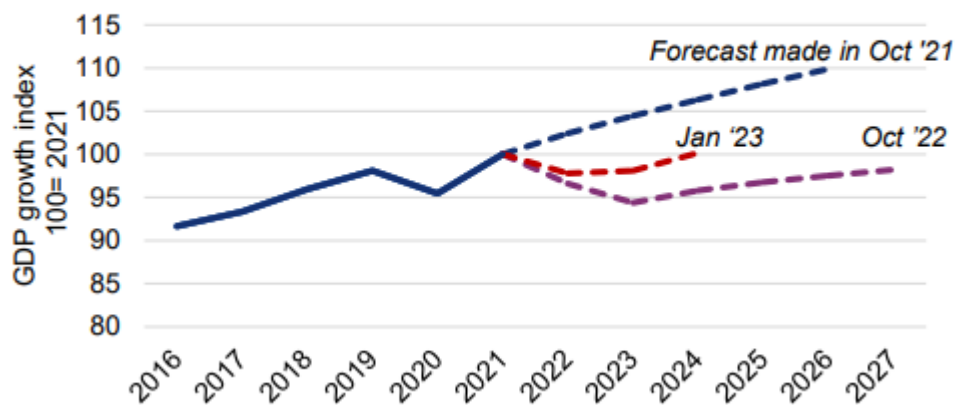
Concluding, we advise that policymakers place importance on gaining cooperation from all countries (sanctioning and non-sanctioning) when implementing sanctions. This will make them more effective. We also advise further research into the unintended effects of sanctions, as these could have significant implications on the effectiveness of sanctions and their ability to achieve their goals.

## Introduction

Economic sanctions (also referred to as sanctions in this paper) have increasingly been used as a tool of modern war. They are a set of economic penalties imposed by one or more countries against another, to advance certain foreign policy objectives (Haass 1998). Sanctions are a common tool within diplomacy, serving as an alternative to military force. There have been several instances of their use over the years, with notable examples being against Russia following their annexation of Crimea in 2014, and following their invasion of Ukraine in 2022 – with Russia currently the most sanctioned country (Bloomberg 2022).

Despite their potential, sanctions face several limitations, as evidenced by the resilience of the Russian economy. Figure 1 below, shows how forecasts for Russia changed dramatically towards the upside since Putin's latest attempt at invading Ukraine.

**Fig 1: The IMF now predicts Russia will grow in 2023 and GDP will recover to 2021 levels by 2024, far earlier than prior estimates**  
IMF forecasts: GDP in national currency, indexed at constant prices<sup>1</sup>



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Two factors may explain how a country continues to survive despite sanctions.

Firstly, sanctions may prove ineffective when countries can offset a decline in trade. This occurs when a sanctioned country increases trade with a non-sanctioning country – limiting the deficit in trade left by the country imposing sanctions.

Secondly, the enforcement of sanctions may be weak as sanctions counter the interests of sanctioning countries. For example, the British government's announcement of a ban on Russian oil and oil products<sup>2</sup> will almost certainly drive energy prices higher at a time the UK is dealing with surging inflation. As a result, some countries may be hesitant to enforce sanctions due to their negative effects, and *sanction fatigue* could emerge as international compliance begins to diminish.

For these reasons, we aim to contribute to existing literature by examining the impact of sanctions on Russia. In particular, we will explore:

- The impact of sanctions on trade with sanctioning and non-sanctioning countries;
- The impact of sanctions on oil exports (for which Russia is a primary exporter); and

<sup>1</sup> <https://www.imf.org/en/Publications/WEO/Issues/2023/01/31/world-economic-outlook-update-january-2023>

<sup>2</sup> <https://www.gov.uk/government/publications/uk-ban-on-russian-oil-and-oil-products/uk-ban-on-russian-oil-and-oil-products>

- The differential effect the threat of a sanction has versus the imposition of a sanction.

Gravity models are typically used to analyse the impact of sanctions on trade. Whilst these are effective in signalling the direction and magnitude of trade flows, they do little in capturing the dynamic effects overtime. For this reason, our research furthers existing evidence by investigating the long-term effects of sanctions on trade using a novel approach.

### **Literature review**

Empirical evidence on the impact of sanctions on trade largely suggests that they have a significant negative effect. Ongena et al (2022) use a VAR model to understand the effects of sanctions on Russia following its invasion of Ukraine. Based on impulse responses to sanctions; they forecast Russia's GDP to decline by up to 16.5% in 2022, and trade imports to decline sharply.

Similarly, Zamani et al (2022) investigated the effects of sanctions on Iran's employment from 1984 until 2020. The authors used a Markov switching model to account for fluctuating periods and found that the probability of staying in the low employment regime was higher under sanctions than the probability of staying in the high employment regime.

A country's level of integration with the global economy can worsen the effects of sanctions, with nations that are export dependent being at greater risk. Ghasseminejad (2020) estimates Iran's daily oil exports fell by 60% between 2011 and 2014 because of US sanctions, whilst Hanousek (2019) estimates the value of Russia's lost trade due to western sanctions at \$1.3bn between 2014 and 2016.

However, integration with the global economy can also present an opportunity. Bienkowski et al (2023) find that Russia was able to mitigate the negative effects of sanctions in 2022 by strengthening bilateral trade with China – partially offsetting Russia's decline in trade with the EU. In 2022, China became Russia's primary trade partner, accounting for 20% of Russia's total exports, up from 15% in 2021.

Some research suggests sanctions may have the unintended effect of increasing trade, especially in the short run. Afesorgbor (2019) finds the threat of sanctions leads to an increase in bilateral trade. This is likely driven by firms exploiting trade opportunities before sanctions take effect, and to stockpile goods in anticipation of sanctions.

Sanctions may further give rise to unintended effects. For example, Haass (1998) argues the use of economic sanctions by the US Government can lead to negative effects for US companies. The application of sanctions can increase direct costs to American businesses from needing to switch suppliers, lost sales, and/or forfeit opportunities. Further, this could cost workers in the form of job losses. Some commentators fear these effects from the US' 2022 sanctions on Chinese processor chip production as US companies begin to shift production elsewhere (Chang 2022).

The impact of economic sanctions can be difficult to isolate as it is often associated with other external factors (Smeets 2018). In the case of Russia from 2014-2016, the economy was already affected by a limited diversified economy and the global decline in oil prices.

In summary, empirical evidence on the impact of sanctions suggests that they have a negative impact on trade. However, whilst they might succeed in this intended objective, the impacts of these blunt policy instruments can give rise to a series of unintended consequences. Therefore, we intend to add to this field by capturing the dynamic effects that sanctions have on trade overtime, and aid the development of more efficient sanctions policies in the future.

## Empirical methodology

### Data and Cholesky ordering

Our data set utilises monthly trade data for Russia between Q2 of 2003 and Q3 of 2022, sourced from Trade Data Monitor. Using this, we derive:

- Total exports for Russia;
- Total imports from Russia by BRICS economies; and
- Total imports from Russia by G7 economies.

In our model, we explore the impact of sanctions on trade with Russia with particular reference to two groups:

- **G7 Economies:** comprised of the United States, United Kingdom, Canada, Italy, Germany France and Japan, who have largely led sanctions against Russia since 2014; and
- **Brazil, India, China and South Africa:** who alongside Russia form the five leading emerging economies (“BRICS”) and broadly have a positive multilateral relationship with Russia.

We include the following variables, and adopt the following Cholesky ordering:

1. Sanctions (Russia 10 Year vs US 10 Year Spread Bond Yield)<sup>3</sup>
2. RUSCB (Russia Central Bank Rate)<sup>4</sup>
3. GDP<sup>5</sup>
4. Total Russian Exports<sup>6</sup>
5. BRICS Imports
6. G7 Imports

We measure the severity of sanctions using the sovereign international bond spread over the US rate (Russia 10 Year vs US 10 Year Spread Bond Yield), in line with the methodology applied by Ongena et al (2022) and Mendoza and Yue (2012). This approach captures global investors’ expectations about the Russian economy, and we argue that this measure rises with the threat of sanctions and hits a peak once sanctions are imposed. This measure is first in our Cholesky ordering as we assume sanctions are the key driver of changes in other variables. All other variables are assumed endogenous variables, influenced by previous variables in the ordering.

One limitation of the international bond spread measure is that it is likely affected by financial conditions within Russia. As such, we include the Russian Central Bank’s key rate as an endogenous variable in our model to account for currency risk. This variable is second in our Cholesky ordering, as we assume the bond spreads respond quicker to the threats and imposition of sanctions than the central bank.

Our Cholesky ordering of the remaining variables reflects the transmission channel of variables. We expect changes in interest rates to affect the components of GDP and this is consistent with studies such as Cozzi et al (2021) that find a strong monetary policy reaction can decrease short-run GDP by up to 0.25%. We include an estimate for Russia’s monthly GDP within our model using data from the

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<sup>3</sup> [Russia 10 Year vs US 10 Year Spread Bond](#)

<sup>4</sup> [Central Bank Rates for the Russian Federation](#)

<sup>5</sup> [World Bank - Russia GDP](#)

<sup>6</sup> [Trade Data Monitor](#)

World Bank. We adjust the latest 2021 estimates by growth projections for Russia (-4.5% in 2022) to derive figures for 2022.

Next in our ordering is total exports from Russia, which follows the intuition that changes in GDP can affect total exports via increased domestic production available for export. We then include total imports from G7 and BRICS economies, which are components of total exports. We also look at fuel imports separately given Russia’s production capacity of this type of good.

Impulse response function and local projection model

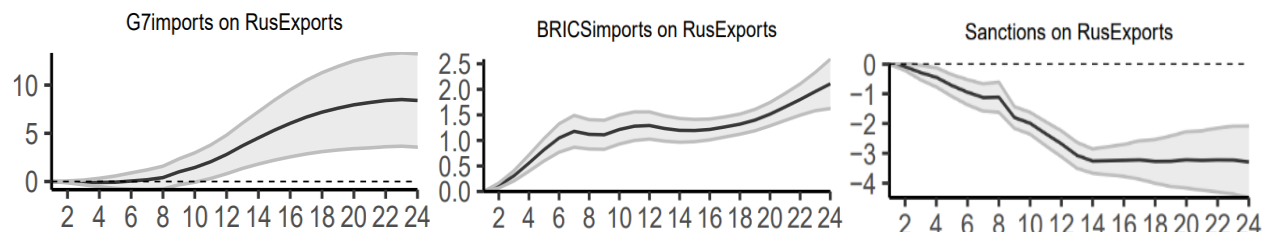
Consistent with previous studies, we used a VAR local projection model to estimate the impulse response function of sanctions on various cross-border variables. We identify an optimal lag period of two months and we estimate a one standard deviation shock across a 68% confidence interval.

We constructed local projections in order to estimate the impulse responses. An impulse response function is a way to estimate the effect of an unexpected change or shock to one variable on all the other variables included in a system. Using this, we can estimate what the impact of sanctions may be on trade, BRICS imports and G7 imports.

$$\begin{pmatrix} Y_t \\ X_t \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \begin{pmatrix} \hat{b}_{11} & \hat{b}_{12} \\ \hat{b}_{21} & \hat{b}_{22} \end{pmatrix} \begin{pmatrix} Y_{t-1} \\ X_{t-1} \end{pmatrix} + \underbrace{\begin{pmatrix} \hat{A}_{11} & \hat{A}_{21} \\ \hat{A}_{12} & \hat{A}_{22} \end{pmatrix}}_{A_0 U_t} \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{pmatrix}$$

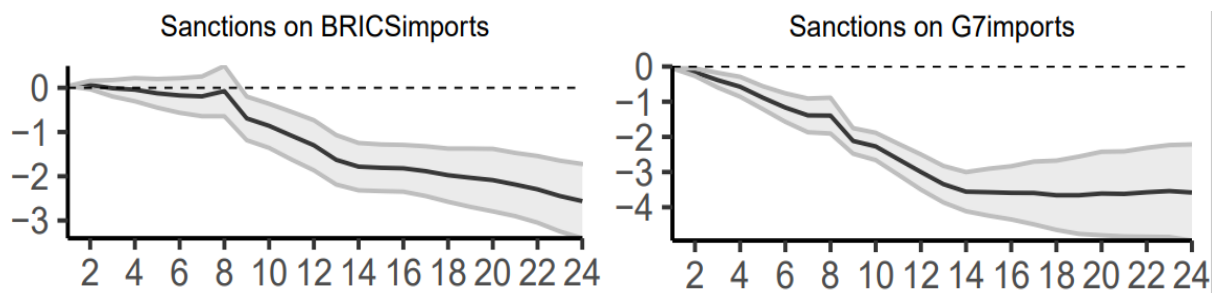
We can see the impulse response function displayed in the VAR model above: with the key differentiator being that because we are calculating the effects of shocks, we write the VAR model in terms of  $U_t$ , the orthogonal shocks, which are uncorrelated with the other variables.

**Results**



In the long term, the impulse response of imports from G7 and BRICS economies has a positive impact on Russian exports, whereas sanctions has a negative effect on exports. This follows intuition, and is a useful initial finding in confirming the accuracy of our model. We observe a greater effect of G7 than BRICS imports on Russian exports, which likely coincides with the number and relative size of G7 to BRICS economies.

Notably, the error bars for G7 imports are considerably wider in the long-term than those of BRICS economies, which suggests uncertainty on the effects of G7 imports on total exports in the long run. This could be, in part, due to the prevalence of sanctions overtime. For sanctions, we observe a negative effect on Russian exports which follows intuition.



In the short term, we note the impulse response is relatively smooth and close to zero when looking at the impact of sanctions on imports from BRICS economies. This suggests sanctions have a minimal effect on BRICS imports in the short term, which aligns with our expectations given Russia’s broadly positive multilateral relationship with other BRICS economies.

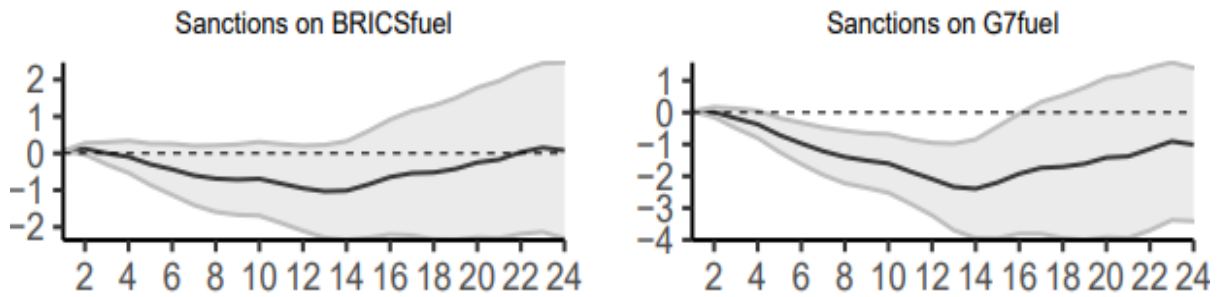
Interestingly, we observe greater volatility from period 8 onwards, suggesting a greater impact of sanctions on long-term trade with BRICS economies. These could be due to a variety of reasons, including non-sanctioning countries not wanting to engage in activities perceived as supportive of the sanctioned country. This could especially be true of economies like Brazil, India and South Africa, who historically received significant sums in foreign aid from G7 economies (see annex: figure 2). However, foreign aid to these economies has broadly declined since 2014/15, and so we may observe different trends when exploring the impulse response of BRICS imports to sanctions before and after 2014/15. Other reasons why long-term imports from BRICS economies may decline include sanctions on Russia resulting in their reduced capacity to produce goods, reduced supply, and ultimately higher prices that may dampen demand from BRICS economies.

The impulse response is negative when looking at the short-term impact of sanctions on G7 imports, and becomes steeper after period 8. This suggests sanctions have a strong impact on G7 imports, which aligns with our expectations. This reduction in trade is likely due to:

- Direct business impact: which prohibits or restricts businesses in G7 economies from trading with Russia; and/or
- Indirect business impact: where firms choose to no longer trade with Russia due to perceived risk or penalties in violating sanctions, or reputational damage from associating with the sanctioned country.

The impulse response may become more negative in period 8 as G7 economies realign their trade with other countries.

The short term impulse response of G7 imports to sanctions contradicts our expectations, going against the positive impact we’d predicted. Existing literature suggested the threat of sanctions has a positive impact on trade, and so we expected to observe an increase in the initial volume of imports. One reason we may not observe this trend is due to this being a relatively new feature of the impact of sanctions on G7 imports from Russia (see Annex: figure 3). When sanctions were imposed on Russia in March 2014, G7 imports only increased by \$1bn to \$13bn compared with two months prior. In comparison, G7 imports increased by \$4bn to \$16bn in February 2022 as compared to two months prior, following sanctions on Russia in February 2022. Therefore, we may observe different trends when exploring the impulse response of BRICS imports to sanctions before and after 2014/15



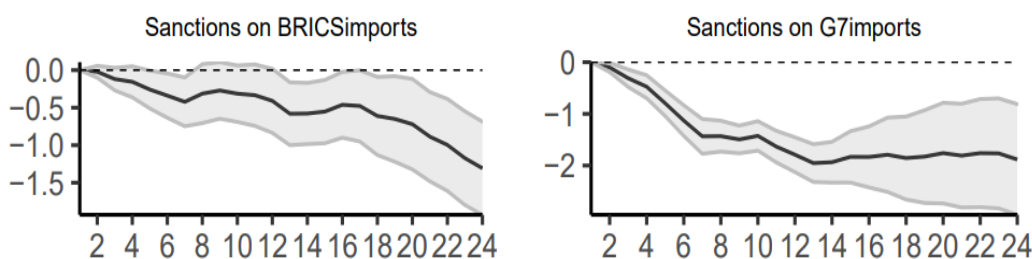
Fuel imports across BRICS and G7 economies appear less reactive to sanctions as compared to all imports. This is likely due to the inelastic nature of energy and other commodity goods as compared to non-commodity goods. Further, for some countries energy cannot be easily stored, likely leading to consistent demand and less volatility across the periods<sup>7</sup>. However, the local projections for fuel imports have considerably wider error bars, meaning it is difficult to conclude with a high degree of confidence.

### **Robustness checks**

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$`shock: sanctions`[[12]]
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	R-sqrd.	Adj. R-sqrd.	F-stat	p-value
h12:Sanctions	0.4633661	0.4322569	14.89482	2.711026e-22
h12:RUSCB	0.5557251	0.5299701	21.57731	2.140079e-30
h12:GDP	0.9617036	0.9594835	433.18374	2.139349e-139
h12:RusExports	0.9389770	0.9354394	265.43026	1.661844e-118
h12:BRICSimports	0.9829311	0.9819416	993.36187	1.131198e-175
h12:G7imports	0.9156287	0.9107376	187.20341	5.358532e-104

To verify the robustness of our model, we examine the R-squared values, which show the variability in the dependent variables that can be explained by the sanctions shock. We observe that over 90% of the variance in our key variables (BRICS imports and G7 imports) can be explained by the sanctions shock. Further, the high F-statistics across all three measures suggest that these are significant relationships.



We also adjust the ordering of variables and move sanctions to the last variable in our Cholesky ordering. This allows us to test the sensitivity of the model to the ordering of variables as it affects the transmission of the sanction shock modelled. Our results broadly remain the same, with an impulse response of BRICS imports to sanctions that are close to zero in the short to medium term. Similarly, G7 imports follow the same trend of a negative impulse response to sanctions that steadies in the medium to long term. This is largely consistent with our previous projections.

<sup>7</sup> Britain's gas-storage facilities can cover about 9 days of demand - a fraction of Germany's 89 days. (Bloomberg 2022)

## **Limitations and areas for further analysis**

In reviewing our study, we identified a few limitations and areas where we could further enhance our analysis.

Firstly, the use of the sovereign international bond spread over the US rate may suffer as a measure of the severity of sanctions, due to it being influenced by financial conditions within Russia. Whilst we include the Russian Central Bank's overnight rate as a variable, this may not fully capture relevant financial conditions. Further, there may be concerns about endogeneity given the interest rate will likely be influenced by the same factors as the bond spread.

Another limitation facing our study is the focus on trade between Russia, G7 and BRICS economies over a specific period. Whilst this is useful in providing insights into the current policy climate, the results may not be transferrable across other bilateral relationships. Moreover, our data for 2022 relies on mirror data given Russia ceased publishing trade data following their invasion of Ukraine. This could result in limitations including missing data or measurement errors that affect the accuracy of our analysis.

Lastly, our study does not consider other factors that may affect trade, such as global economic conditions. This further raises concerns about causality that may affect the validity of our results.

In advancing our work, we would focus on constructing a more robust sanctions index. This would allow us to isolate the impact of sanctions from other variables such as oil prices and inflation. It would also allow us to differentiate between a sanction threat versus a sanction imposition. For example, Bali (2021) advises categorising sanctions by their relative severity, with differing values applied to sanctions on individuals, entities and sectors. However, the authors themselves note limitations with this method as it suffers from a "proportionality" issue, where sanctions against several individuals could be equated to a sanction on a sector.

## **Conclusion**

Concluding, our research contributes to empirical analysis by highlighting the negative impact of sanctions on bilateral trade, and we advance existing literature by capturing the dynamic effects that sanctions have on trade overtime.

We find that sanctions are effective where trade relationships exist, and are strengthened by multilateral cooperation. A joint effort between international partners makes it harder for sanctioned countries to replace export markets, increasing the likelihood that sanctions are successful in reducing trade. Where alternate export markets exist, sanctioned countries may be able to offset negative consequences, which may limit sanctioning countries ability to achieve foreign policy aims.

For all goods, we find that sanctions are an effective lever in reducing trade; however, they may have limited effects for specific goods such as fuel. This is an important consideration when levying sanctions against export-dominant countries, or for countries, whose exports are demand inelastic. We advocate for further research into this field to corroborate indicative results.

Our research did not suggest a significant difference in the threat of a sanction versus the imposition of a sanction; however, we recognise that this could be an emerging trend. This could have important consequences for how sanctions are implemented, with due care taken to ensure they do not undermine their effectiveness. We advocate for further research into this field.

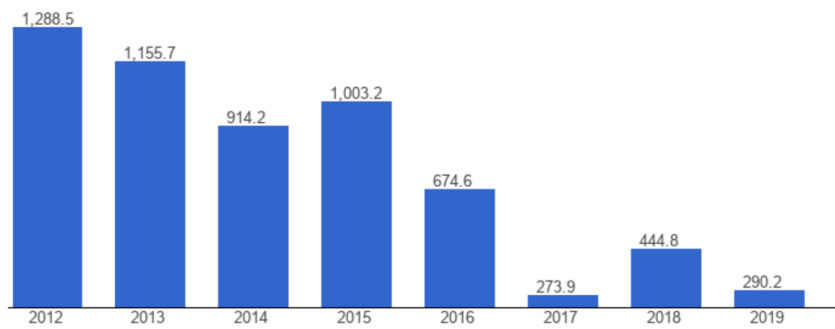


## Annex

### Figure 2

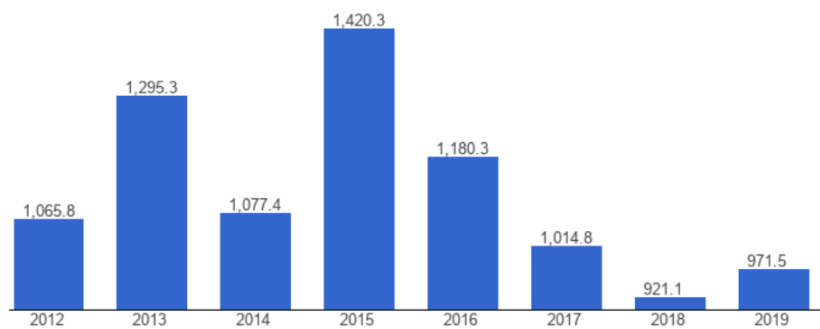
#### **Brazil, Foreign aid and official development assistance received**

Source: World Bank via The Global Economy<sup>8</sup>



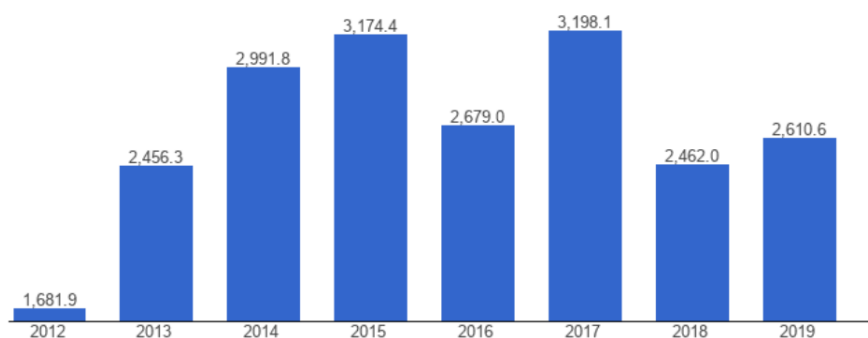
#### **South Africa, Foreign aid and official development assistance received**

Source: World Bank via The Global Economy<sup>9</sup>



#### **India, Foreign aid and official development assistance received**

Source: World Bank via The Global Economy<sup>10</sup>



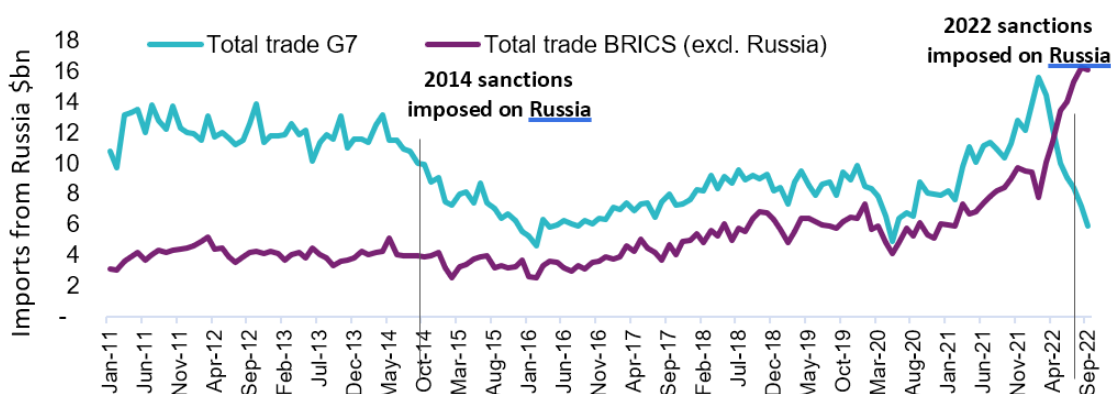
<sup>8</sup> [https://www.theglobaleconomy.com/Brazil/foreign\\_aid/](https://www.theglobaleconomy.com/Brazil/foreign_aid/)

<sup>9</sup> [https://www.theglobaleconomy.com/South-Africa/foreign\\_aid/](https://www.theglobaleconomy.com/South-Africa/foreign_aid/)

<sup>10</sup> [https://www.theglobaleconomy.com/India/foreign\\_aid/](https://www.theglobaleconomy.com/India/foreign_aid/)

**Figure 3**

**Imports from Russia for BRICS and G7 countries (Jan 11 – Sep 22), Trade Data Monitor, 2022**



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