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Article

Impact of economic sanctions on net commodity-producing and net commodity-consuming countries

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Abstract

The war in Ukraine has had a marked economic impact. However, since Russia is a net producer of important commodities, the impact of sanctions on its economy was less than expected. But what would happen if there was a war involving a country that was a net importer of commodities? In the case of a possible China-US conflict over Taiwan, the impact on the world economy would be different, with a deeper recession around the world, but the impact on the Brazilian economy would still be positive on account of the possibility that would remain of agricultural exports to China.

Keywords: commodities, exports, economic sanctions, war.

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Introduction

Russia's recent invasion of the Ukraine and China's aggressive response to Nanci Pelosi's visit to Taiwan are signs of the increasing unrest in the international order. A new cold war that is emerging between the West (including Japan, South Korea, Australia and New Zealand), headed up by the USA, and an alliance between China and Russia, has resulted in an international situation similar to the one which existed between 1949 and the early 1960s - the year of the breakdown in the alliance between China and the Soviet Union.

The West's response to the invasion of Ukraine has been on two fronts: the military one and that of economic sanctions. The military front entails supplying increasingly sophisticated weapons, along with training in the use of weapons and intelligence sharing that has enabled the Ukrainian forces to make more precise and devastating attacks. The economic response involves incisive

sanctions, including measures that were previously regarded as being all but impossible, such as the widespread withdrawal of Western companies from Russia and the freezing of roughly half of the Russian Central Bank's reserves deposited in Western banks. Relations between NATO and Russia exhibit components that are typical of a war, such as the use of US intelligence information to destroy Russian command and control targets and the killing of Russian generals. Despite Russian threats of escalation, including the use of nuclear weapons, the West has not backed down in regard to military support for the Ukraine.

Any future Chinese invasion of Taiwan will probably also result in a dual response from the US and its allies, one that entails both military and economic dimensions. However, it is very hard to predict the proportional weight given to each of the two responses. Xi Jinping has staked all of his prestige and power within the Communist Party on conquering the island, in all likelihood now by invasion, given that polls indicate that more than 80% of Taiwan's population rejects reunification in the wake of the repression witnessed in Hong Kong. Analysts estimate that an invasion of Taiwan could take place within a few years (Krepinevitch 2021; Colby 2022). On the other hand, there are those who envision a much longer-term strategy, as has been the case in recent years. Winning by fatigue and, furthermore, that the negative example of the impact suffered by Russia would prevent any invasion in the next few years (Nathan (2022)).

But can the economic impact for Russia and China be interpreted in the same way? Would there be any difference in terms of economic impact that could lead to different outcomes in a war in the two cases? This paper aims to show that the answer to this question is yes, and that the difference lies in the structure of each country's economy.

Russia is an exporter and producer of commodities while China is a net consumer of commodities. The Ukraine war triggered a shock in world commodities, on account of the fact that the two countries involved are major producers of important commodities (oil, natural gas, and grain). This commodity price shock ended up being positive for Russia, since the marked increase in prices offset the drop in exports to Europe and the USA. Countries like China, India and Turkey became buyers of Russian products, and the net inflows of funds into Russia remained strong, cushioning the impact on the economy. The European and US reaction to Russian commodities was much more complicated because there were pipelines in operation that were difficult to reverse in the short term and a significant alternative partner, namely China, which is interested in keeping Russia on its feet for clear geopolitical reasons.

The Chinese case in an eventual confrontation with Taiwan is different. Due to the fact that it is a net importer of commodities, the global reaction, especially from the US, which is a major exporter of food to the Chinese, could result in shortages with much more serious economic repercussions. In the Russian case, China has been a country that has indirectly mitigated the sanctions. But in the Chinese case, who would be able to soften the sanctions? There is no country that is big enough, but Brazil could come into the picture as a major grain supplier, more so than it is today. The geopolitical implications of this in a country so close to the US would be important.

The aim in the next section of this article is to construct a theoretical framework of the differences that may have an impact in the case of economic sanctions in commodity-producing or commodity-consuming countries. We will give an illustration using the recent Russian case and what could be an articulated response in the future case of a Chinese invasion of Taiwan, making a comparison with historical examples. Lastly, we will reach a conclusion.

Brief theoretical framework

There yet are no theoretical or empirical studies that make this differentiation between net or non-net export of commodities in the case of economic sanctions. In the specific case of sanctions, it has repeatedly been the assessment that they are flawed, and even authors who are more in favor of sanctions, such as Drezner (2022) and Hufbauer et al. (2020) point out the difficulties of applying them. Drezner (2022) considers that sanctions should continue to be applied, with catastrophic results on the economy without necessarily succeeding in ending the conflict, and Hufbauer et al. (2020) suggest that large countries are generally impervious to sanctions and that they hardly ever lead to any change in the course of action. Ultimately, the conclusion is that innovations in sanctions in the 21st century have not made them more effective at all. Mulder (2022) arrives at a similar conclusion, pointing out that sanctions usually work much better when they are imposed on a smaller and weaker country or even on people and companies. The cases studied here of two types of large countries like Russia and China represent a challenge to the proper functioning of economic sanctions overall.

From an economic point of view, a number of studies have clearly shown the impact of sanctions both on the country that suffers the war and on the one that causes it. Forland (1991) analyzes which type of product should be subject to sanctions in order to have a greater impact on the country causing the war and suggests that more inelastic products would result in a greater effect. However, his assessment focuses more on the effect on military goods or those that have impact in terms of political strategy, without making any differentiation as to whether the country in question is a net exporter or importer of commodities. In a non-cooperative game, Hirshleifer (1995) shows that two countries in an anarchic system suffer economic consequences in a war, but without taking into account their economic structures. The author's concern was to understand whether the conflict could lead to a hegemon or not, which in fact occurs in his model. Hausken (2006) arrives at a similar outcome, one in which a hegemon results, but with economic losses on both sides. However, once again he makes no differentiation as to the structure.

Sturm (2022) considers the economic impact on the country that is applying the sanctions and finds that limited economic sanctions on the trade of the country to which the sanctions are being applied can actually increase the welfare of the country that is applying the sanctions. However, more severe sanctions can have an equal impact on both countries, but again without identifying any different economic structure. Gross (2022) studies the impact of an increase in the

import tariff on natural gas exports by the Europeans in the Russian case during the Ukraine war. In this case, it is the impact on top of a monopsony product at that time rather than on top of a more general commodity export and import structure that has the most influence. Bianchi et al. (2022) looks at the impact of sanctions from a theoretical point of view and their impact on a possible default of the country to which the sanctions are being applied. If the sanctions are mild, default is avoided and the country that applied the sanctions is not affected. But if the sanctions are strong, the country to which the sanctions are being applied may be affected economically. In a way, this is what has been happening in fact with the US and Europe, not via the impact on the debt market, as pointed out by the authors, but due to the impact of commodities via inflation.

Either way, since the Ukraine war began a significant number of studies aimed at understanding the war's impact on the economies of the countries involved have been released. Bachman et al. (2022) and Baqaee et al. (2022) analyze the impact of the war in general semi-structured models considering a total embargo on Russian energy exports. Some other studies, such as those of Hausmann (2022) and Chaney et al. (2022), indicate that the use of import tariffs would be enough to have an impact on the sanctioned economy without having an unduly marked effect on the economies of the countries that are applying the sanctions. But none of them make any differentiation between net producer and exporter of commodities versus net importer. It should be borne in mind that the study refers to countries being net exporters and net importers of commodities. For example, in the case of China, exports refer basically to refined oil, tea, plywood, and gas, adding up to a total of US$ 32.1 billion in 2021, while the most significant imports totaled around US$ 362.1 billion, which is more than ten times the amount exported. The difference in the Russian case is even worse, with US$ 269 billion of exports in commodities versus US$ 6 billion of imports. China is clearly a net importer of commodities while Russia is a net exporter.

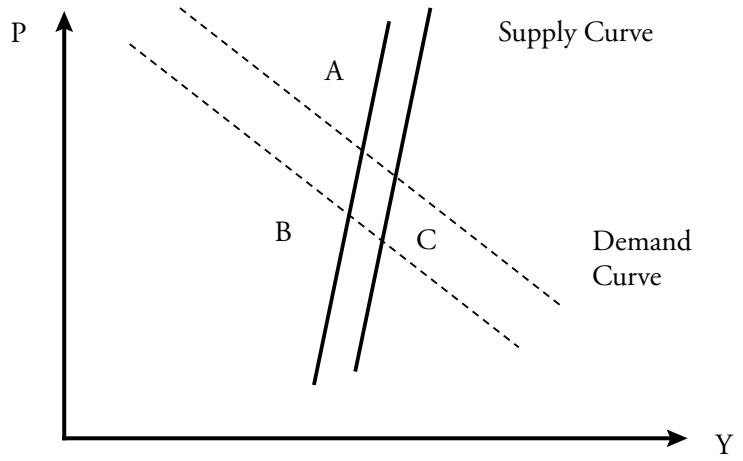
Here it is worth pointing out a result by Lorezoni et al. (2022) that identifies that the drop in the exchange rate seen in Russia after the war began is a necessary consequence of the increased demand for domestic products in the wake of sanctions. Exchange rate appreciation would be a natural result as a way to increase purchases of imported products from countries other than those that applied sanctions. Even if this is the case in Russia, the appreciation of the exchange rate precisely enables a lower impact from inflation and the search for alternative foreign demand. Itskhoki et al. (2022) corroborate these authors' results.

Since we are dealing with one situation that is still ongoing (that of Russia and the Ukraine) and another potential one (that of China and Taiwan), the study has a theoretical background that can be schematized as follows.

A stronger demand for Brazilian commodities may initially be caused by inflationary factors. In figure 1, in a classical supply and demand analysis, it can be noted that a stronger demand for Brazilian agricultural commodities would initially cause a greater increase in prices than it would in activity, since agricultural production has a much longer production time lag than industrial goods and services. However, the drop in the prices of metal and energy commodities, coupled

with the impact of a pronounced slowdown in China and the US, would push demand down, offsetting the effect on agricultural prices. Here, we stress the point of difference between a war in Ukraine and one in Taiwan. In the case of the latter, the direct involvement of the world's two largest economies would have a much greater recessionary effect than in the case of the Ukraine war. But at a later moment, the effect of increasing agricultural production along with the prices in the sector could have an impact on the level of activity, shifting the equilibrium point from B to C, with an increase in agricultural supply. The final impact is likely to be increased activity and lower prices, due to the more pronounced recessionary scenario in the case of a conflict with China.

Figure 1. Commodities demand and supply curve



Source: drafted by the authors.

Brazil was heavily affected by the Russian crisis due to the fact that it is a consumer of important products produced by the Russia/Belarus/Ukraine region, with inflationary consequences that we are experiencing all over the world. Empirical results have clearly demonstrated the negative impact that the Ukraine war has had on world activity and world inflation (Caldara et al. 2022; Coulter et al. 2022; and Ronaghi et al. 2022).

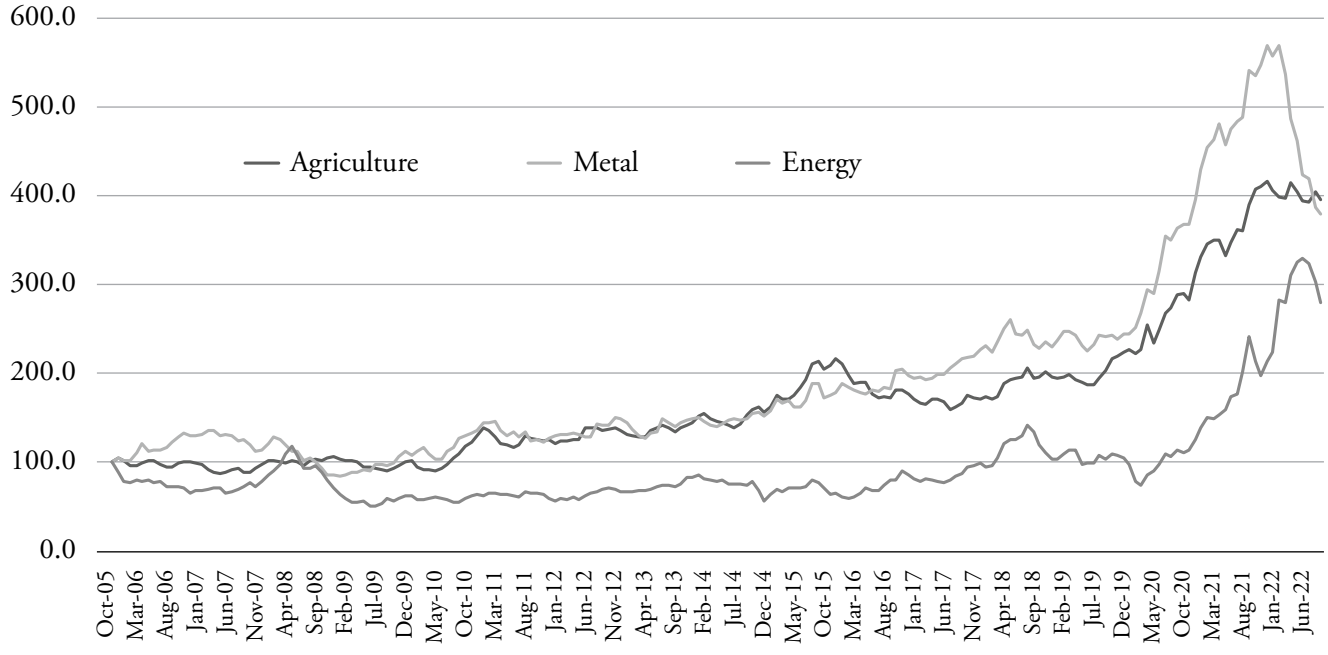
But in the case of China, the impact could be deflationary rather than inflationary, and Brazil would experience complex impacts, as there would not be any pressure on its input chains (oil and fertilizers) and it would obtain gains due to the positive pressure on commodity prices and volumes (in the case of a more pronounced exit of the US and Australia from this market), but could suffer a great deal on account of the widespread disruption of international trade and global value chains and substantial price increases for high-tech products. It should be stressed that the deflationary impact would come from the fact that the world's two largest economies (the USA and China), would be deeply affected on both the production and consumption fronts, whereas the Ukraine war only had a direct impact on a small economy, namely that of Russia. A recession in China and the US has a much greater deflationary impact than a recession in the Ukraine.

Here, it is worth examining the inflationary impact of the two conflict situations in commodity-producing or consuming countries in greater depth. Economic sanctions in the case of conflicts in commodity-producing countries, particularly if the affected area is an important producer of a number of these inputs, puts pressure on the global value chains, especially in the final production of products that make use of these commodities, as we have seen recently in the case of oil and fertilizers.

But in the Chinese case, the initial impact would be one of deflation, as there could be a drop in GDP in China, which is currently the richest country. Even if the Chinese were to try to respond to sanctions with counter-sanctions for exporting products, especially to Americans, nowadays global value chains are starting to become more diversified than in the past and the Chinese are becoming less and less dependent. Reducing China's exports would not mean that Americans would be without this particular product, particularly in the case of lower value-added products that are increasingly beginning to be produced by countries such as Vietnam and Ethiopia.

The fall in Russia's GDP is not deflationary for the world because Russia accounts for no more than 2% of world GDP, but a recession in China, which represents 20% of world GDP, has a more deflationary character on account of the impact on its demand, especially if the USA were to become more involved in the Ukraine than it is at present. Moreover, a commodities embargo could result in more commodities being available around the world, which would lead to a drop in prices in this segment. Perhaps it is worth adding that a war like this one can have a more pronounced effect on commodities that are more closely linked to the level of activity, such as energy and oil, than agricultural commodities, which continue to grow due to the demand for food that remains strong even during a crisis. This is the effect that we are currently seeing in Brazil (Chart 1).

Graph 1. Commodities Index in R$ - Brazil (Dec/2005=100)



How would Russia behave? Once again, domestic strategic interests would speak louder. In the case of the commodities that could most affect China, namely metals and agriculture, Russia is not a major producer and any future recession in China could lead to a drop in the demand for oil, which is a product of vital importance to the Russians. A China/Taiwan conflict is of much less interest to the Russians than the Ukrainian conflict currently is, from an economic point of view, to the Chinese, who are benefiting from the chance to buy oil and create future outlets for natural gas exports to the Chinese in the long term.

Some empirical evidence

A number of studies have signaled the impact of economic sanctions on some specific variables. For example, Wang et al. (2019) show for a panel of 23 countries that economic sanctions increase the country's exchange rate volatility or else that a lot of future price movements in general are already priced in before the war starts, as was the case with agricultural prices in the wake of Russia's invasion of the Crimea in 2014 (Klomp 2020). In another study, Neunekirch et al. (2015) identify the economic impact of sanctions on growth and support the view that the impact is positive, particularly if imposed by the United Nations, with a per capita GDP loss within 10 years of the order of 2.5 to 3.5 percent. However, the authors find that if sanctions are only applied by the US, without UN support, the impact decreases to 7 years and to between 0.5% and 0.9% only, which also shows the need for sanctions of this type to have greater international coordination and not be imposed unilaterally. Continuing on the idea that the impact of unilateral sanctions is less than that of multilateral sanctions, Caruso (2003) identifies a significant negative impact of economic sanctions on the international trade of the affected countries, being greater when the sanctions are multilateral than when they are just bilateral. But the impact of sanctions can also be negative on democracies as shown by Peksen et al. (2010), increasing the risk of an escalation of authoritarianism in the wake of sanctions being applied.

One example in the Russian milk market after the trade sanctions applied by the Europeans in the wake of the invasion of the Crimea indicates that by banning the import of these products, the milk market in Russia flourished, with the distribution of resources from consumers to producers. In other words, as a result of higher prices the producers were the ones who obtained greater returns and, therefore, the Russian government ended up having little incentive not to ban imports anymore (Krivko et al. 2020).

Table 1. Russian economic statistics before and after the war

Economic Statistics	Before de War (beginning of 2022)	After the War (end of 2022)
Exchange Rate (Rub/US$)	80.0	67.0
Basic Interest Rate (%)	8.0	7.5
10-year Interest Rate (%)	8.4	10.2
GDP (IMF Forecast %)	2.8	-3.5
Stock Market (MOEX) Index in thousand points	3.4	2.1
CPI (%)	9.2	12.0
PMI Manufacturing (Index)	51.8	53.7
Unemployment Rate (%)	4.3	3.9
International Reserves (US$ billion)	630.0	567.0
Current Account (US$ billion)	47.0	52.0
External Debt (US$ billion)	478.0	437.0

In general, the Russian figures indicate an economy that has clearly weakened, but has managed to reverse a trajectory that could have been much worse (table 1). And this is largely due to the fact that the country, as a commodities producer, was able to benefit from the marked price increases in these products. Indeed, the Russians have a significant share of the world's production of natural gas and oil and, on top of that, they are the world's largest producer of palladium, an important metallic mineral in the production of semiconductors, which also helps with getting closer to the Chinese.

The price of a barrel of oil, which reached almost US$ 130 in March, remains below US$ 80 in December, while the price of natural gas, which is essential for the Russian market and of which it is a bigger producer than of oil, has rocketed since the start of the crisis and now stands at US$ 9.3 MM/Btu, which is three times the price it was last year. It is important to remember that the Russians are selling their oil at a discount, but even so with an advantage given that this year prices jumped above what they were last year. In some reports the discount is as much as US$ 30 a barrel for exports to China, but either way that reinforces the connection with the Chinese for the future (Cheong 2022). As a matter of fact, Russian oil exports have remained at pre-war levels on account of the increase in exports, especially to Asia and Africa. There is currently a discussion underway regarding putting a cap on the price of oil exported to Europe at US$ 30 a barrel, but this would not prevent the Russians from continuing to sell to other players because the cap is not global and its effectiveness is diminished when there are major buyers such as the Chinese.

For the rest of the world, the impact of the increase in commodity prices has been very negative due to the impact on inflation and, for food-importing countries, in terms of food security. The countries of Europe in particular, which are the ones that have been the most affected by

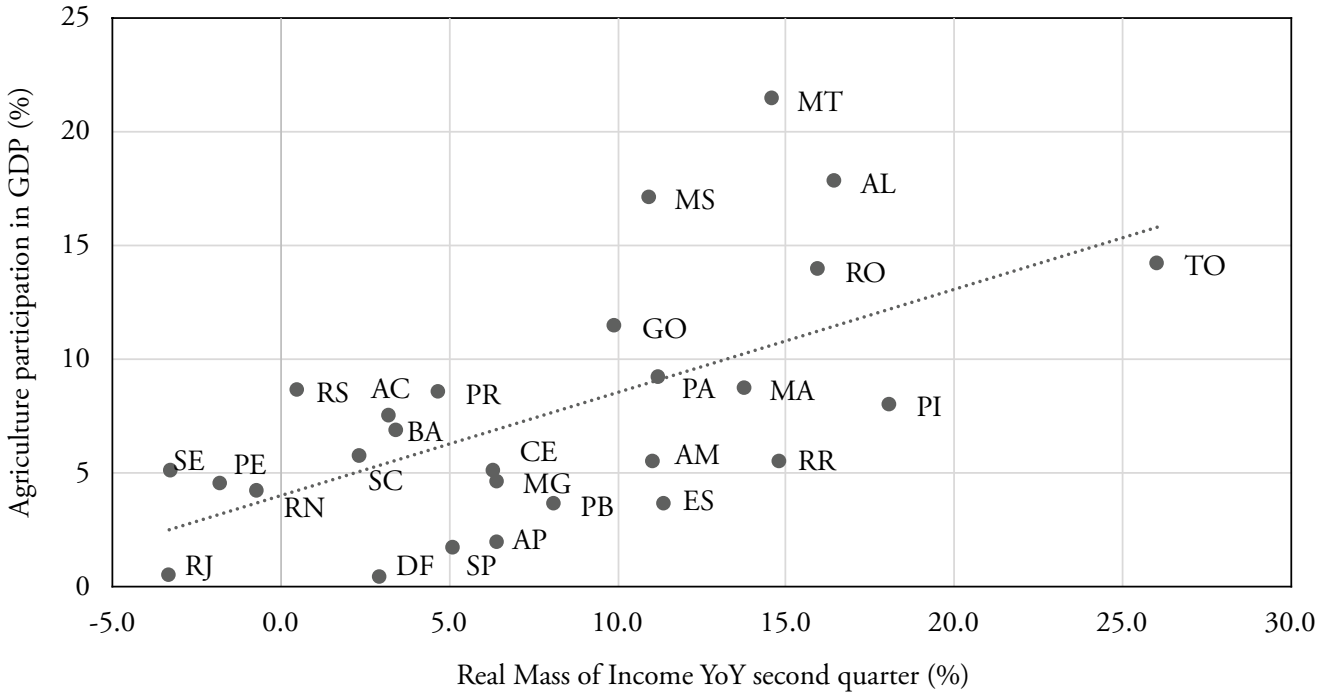
the price of energy, such as natural gas, have seen their inflation rates accelerate more since the start of the war. It is true that inflation had already been rising because of the pandemic and the massive fiscal packages that had been implemented since 2020, but from March onwards inflation in the UK and the Eurozone began to get worse, with Britain's cumulative 12-month inflation figure in July hitting 10.1%, by comparison with an inflation figure which up until February had stood at 6.2%.

Overall, what you see is that the economic impact of the war on Russia is being alleviated by the price effect of commodities on a major commodity-producing country such as itself, which helps to offset the adverse effects of economic sanctions. On the other hand, countries that consume these commodities, particularly the developed ones, are suffering the impact on their economies.

The IMF's expectation at the start of the year was that the US would register economic growth of 4%. However, due to the need to raise the interest rate as a result of the inflationary impact accentuated by the war, the expected growth this year is now 1.6%, with a likely downward revision in the wake of two back-to-back drops in GDP in the first and second quarters of 2022. The German case is even more symptomatic, where the expected increase in GDP went from a figure of 3.8% at the start of the year, to one of 1.5% according to the latest estimates for July, with an expected drop of 0.3% in 2023. Given the winter ahead, which is expected to lead to lower gas consumption on account of the sanctions, the likelihood is that this figure will undergo further downward revisions. On average, developed countries were looking at an expected growth of 3.6% at the start of the year, but this figure now stands at 2.4% for 2022 (IMF 2022).

The Brazilian case is interesting, given that since the country is an important commodity producer, the initial impact on prices was favorable in terms of the level of economic activity, notwithstanding the impact on inflation. In fact, at the start of the year the expectation was that Brazil's GDP would register a growth of close to 0% this year, whereas now the country is expecting a 3% growth in GDP, according to the Central Bank's Focus Bulletin. A large part of this growth comes from the services sector's post-pandemic recovery, but the rest can be attributed to the impact on commodities, when we take into account that the agribusiness sector accounts for almost 30% of Brazil's GDP, according to CEPEA/Esalq/USP and the real income mass (employment x income) has increased precisely in agricultural regions (graph 2). Clearly, this effect is not totally on account of the war and its impact on commodities, but it demonstrates how the increase in prices in the sector has helped to boost the growth of those states that are heavily reliant on agribusiness.

Graph 2. Real mass of income (employment x income) versus agriculture's share of Brazil's GDP – growth in the 2nd quarter vis-à-vis the 2nd quarter of the previous year in %



But if at the outset there is a positive impact on economic activity on account of commodities, the second impact that results from the increase in inflation and, consequently, the hike in interest rates, is a very negative one. In fact, both Australia and Brazil will experience a marked downturn in activity next year, with the Central Bank's Focus Bulletin forecasting a mere 0.7% increase in Brazil's GDP and the IMF indicating that Australia's GDP will grow by 2.2%. Countries that have a strong oil base, such as Saudi Arabia for example, will register their best economic growth in years in 2022, as reported by Mati and Rehman (2022), with a projected 7.6% expected increase. After all, the war has been a good deal for commodity-producing countries, but with the additional effect of inflation that will end up reversing part of the short-term growth through interest rate hikes.

Possible implications of a future war between China and Taiwan

With sanctions having less of an effect on Russia and causing heavy damage worldwide, there is a calculation the Chinese need to make: given that the response is predominantly via economic rather than military power, what level of impact could sanctions have on the Asian country? A starting point for understanding the possible differences between Russia and China is to understand the two countries as different holders of a key economic asset, namely commodities. Economic sanctions that attempt to affect commodities may initially have fewer negative effects for those who are producers than for those who are consumers. The basic reason for this is that sanctions

that affect production without a precise price cap end up increasing the dollar value of exports of the embargoed products. What has been seen in Russia and around the world over the course of this year has given us a taste of this. The application of sanctions to the production of natural gas and oil, among other products, enabled the price to register a sharp increase on account of the lack of supply of these products. Even though the Russians have been exporting a lower volume, they have managed to get a reasonable return in dollars and the expected economic impact has apparently been smaller than was initially imagined at the start of the war. However, there are some analysts who have questioned this assessment based on the direct manipulation of Russia's economic statistics by the Kremlin.

The Chinese case is different. It is a consumer and economic sanctions could come from the export of commodities from major producers. A number of arrangements have already enabled a certain reaction, such as for example via Quad, the agreement between the USA, Australia, Japan and India, which already has the intention to bar China economically. In this case, only Australia and the USA are significant exporters of commodities to the Chinese, but the Quad base could lead other important countries to take a similar stance. However, the Ukrainian war may be partially weakening QUAD. Up to this point the Ukrainian war has caused a decrease in Chinese/Indian geopolitical rivalry and increased Russian/Indian and Chinese/Russian economic interdependence. The advance in the centralization of power by Modi, which has transformed India from an electoral democracy into an electoral autocracy, has also contributed to a certain decrease in tension between the Asian powers. The three countries are the core members of the Shanghai Cooperation Organization - which was expanded with the inclusion of Iran at the Samarkand summit in September 2022 - and which is designed to offset US dominance in Asia. The Americans were extremely disappointed with India's failure to condemn the invasion as well as by the increase in Russian oil and gas exports to India.

In the Chinese case, only examples from the past can serve as a guide at this time. Perhaps the best cases are the embargoes against Italy in 1935 at the time of the Ethiopian invasion and against Japan before World War II, but also the China-US trade war that started in 2018.

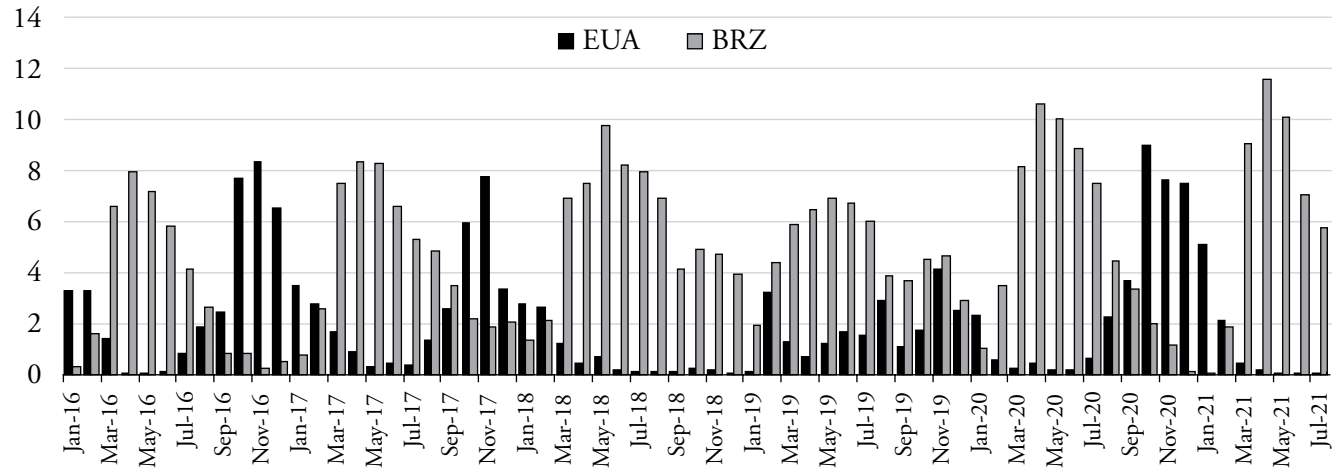
The German case in World War I is of particular interest to Brazil. When World War I broke out, the European countries and the United States blocked the purchase of steel and manganese by the Germans. Brazil was the fourth largest exporter of manganese to the Germans, an important metal for making steel alloy. With the loss of market and geopolitical interests due to the war, Brazil was able to quickly switch its exports from Germany to the US and was able to achieve a more than fourfold increase in the amount previously imported by the USA (Mulder 2022a). It should be noted that in the case of the current embargo, Brazil misses out on the opportunity to export the natural gas that the Europeans no longer want to import from Russia because the country does not have enough liquefied gas terminals for this purpose, unlike the US (Vale 2022).

China will only be negatively affected to any material degree if the response is more unified than in the past. The Italian and German examples show the need for collaboration between the countries that will use sanctions in order for them to work. In the Russian case, it is slightly more difficult for them because natural gas depends on pipelines that cannot be built quickly in an attempt to shift trade to China. However, for the most part the type of inputs that the Chinese consume arrive by more flexible means, such as ships and planes. This makes it easier to look for alternatives.

Any future sanctions in which only developed countries take part, such as the USA and Australia, which are important producers of commodities, can be reversed, as the above examples illustrate. But sanctions of this type could be even more beneficial for Brazil from the point of view of economic activity than the sanctions against Russia have been, which have the side effect of inflation. It is important to stress this because the impact would potentially be even more positive for Brazil. Given that Brazil is the main country supplying China with agricultural and metallic commodities, any future decrease in US and Australian exports of these products to the Chinese would open up a huge space for Brazilian exports. Given that, in theory, Brazil would continue to export to the Chinese, the cut in exports of high technology products to Brazil would be substantially mitigated vis-à-vis the impact that it could have on the USA and Australia. In this sense, we could well see a repeat of what happened to Brazil in the case of the trade war between China and the US during the Trump administration. Brazilian agriculture, particularly soybeans, corn and meat, substantially exploited the window opened by the American trade war and as a result there were significant gains in exports in those years. Soy is a relevant example. When American exports stopped in 2018, Brazil took over all of these exports and gained market share from the Americans (graph 3). In the 2019/20 harvest, 70% of China's soybean imports came from Brazil, whereas this figure currently stands at 51% following a certain degree of normalization in US grain exports to the aforementioned Asian country.

But the losses to American consumers from China's retaliation against American agriculture were huge. Amiti et al. (2020) estimate that almost US$ 7 billion were lost during the first 11 months of the tariff war, as well as around US$ 12 billion in losses in terms of increased revenue for the federal government. Furthermore, the tariff increase against China was being passed on in full to Americans in terms of increased costs and loss of real income. In the case of agriculture, losses for the Americans were significant and were an indication of future risks if the Republicans were to win the US election or if there were to be a war between China and Taiwan. Furthermore, it is worth remembering that the biggest loser at the end of the day was the World Trade Organization which once again saw its multilateral decision-making process being ignored. Any future war in Asia would have the role of further weakening the WTO (Krueger 2020).

Graph 3. Soybean exports from Brazil and the US to China (millions of tons per month)



The environmental issue also emerges as a relevant impact factor. By forcing developed countries to increase production of fossil fuels in order to offset the loss from Russia, particularly in the oil market, slow-paced decarbonization is even further jeopardized. A number of European countries have resumed the consumption of coal on a larger scale and the fact that Saudi Arabia has grown by almost 8% in a year in which the world is on the verge of a recession shows just how much the fossil fuel market has been given a boost by the war. But, in addition to this, there is the discussion of green commodities, which are important in the production of clean energy and its equipment. In this case, it should be borne in mind that China has a presence in the corporate control of a number of companies in the sector, but not complete dominance. For example, in the case of lithium, 77% of the reserves are concentrated in Chile, Australia and Argentina, while China has a mere 6.8%. But almost 55% of production control is in Australia, which shows the power of response to China, along with the US, in the case of an invasion of Taiwan. Lithium is one of the main metals used in high technology and semiconductors, and with the trend for countries to be concerned in regards to keeping control of reserves and production in their own countries, it is not hard to see China will have difficulty purchasing noble metals for its green energy production. This is because the Chinese also have a predominance in this type of production in contrast to Russia and the USA, which have control over oil and natural gas. Either way, China often appears as a controlling shareholder or a major participant in the control of the production of these metals, even if they are produced outside China. Brazil only has a significant presence in nickel, with high production and reserves under Vale's control. Furthermore, in the case of those metals that are even more important for semiconductors, which are rare metals, China has significant control of reserves and production. The United States and Europe have a low share of the reserves and production of these metals (Leruth et al. 2022).

China could also respond by cutting the exports of these metals for the production of high technology goods dependent on them, not to mention the export of these goods themselves. But China entering a deep recession has the aggravating factor that it can be disruptive from

a political point of view. In the Russian case, as we said, the effects of higher prices ended up helping to restore the Russian economy, even though it is still in recession. But in the case of China, the impact could be even more dramatic, as it could signal a stoppage in production and marketing of the current flagship of Chinese growth, which is high technology, without an alternative buyer the size of the US and Europe. One can think of a few specific products such as Apple cell phones, which are produced almost entirely in China, or TSMC semiconductors, which account for 40% of world production and which would be entirely in Chinese hands. It is worth remembering the case of palladium, of which the Russians account for 45% of global production and which is an essential input for semiconductors. With the increased closeness between China and Russia, this market would also be closed to the Americans. The issue here involves the dynamism of the Chinese to verticalize the production of high technology as quickly as possible and drastically reduce the country's dependence on Western high technology, given the high degree of globalization and integration of global value chains (Baldwin 2016; Baldwin and Freeman 2021) a crisis of this magnitude in these goods could transform the process of slowbalization (a decrease in the pace of intense globalization that we had until the 2008 crisis, that has already been well documented (Antras 2020), which we have been witnessing over the last few years, into a process of partial deglobalization with the formation of two large economic blocs that are separating from each other.

Therefore, a war involving China and Taiwan could change the process from one of slowbalization to one of partial deglobalization, and this is precisely because the affected countries are the world's two largest semiconductor producers. The recent production diversification trend that we are beginning to observe more intensely, no longer just in the sense of having a buyer from just one country, but having a number of possible buyers from different countries, has started to become a reality (IMF 2022b). For political reasons, China has shifted towards trying to produce everything more intensively within the country. In fact, this was the same behavior as that seen in Japan and Germany after sanctions were applied to Italy in 1935 on account of the invasion of Ethiopia (Mulder 2022a,b). Perhaps not specifically because of a conflict with Taiwan, but because of the need to prepare for a long-term multidimensional confrontation with the US, China has decided that it wants to be more self-sufficient from an economic point of view (Kroeber 2016; and Gave and Gave 2019).

Thus, in addition to the Ukraine war being a sign of behavior for the Chinese, the same way as the Italian invasion of Ethiopia was for the Germans and Japanese, it reinforces the hypothesis that the recent process of slowbalization could be heightened with a deeper division of global value chains, with cost implications for the entire world, especially for the poorest countries. Furthermore, it erodes the possibility of more consistent global climate governance.

But it is not just that. The future risks of a conflict in Asia involve different responses than the usual economic sanctions. The risks of cyber warfare are accelerating. According to most analysts, America's cyber defense capability in relation to its civil and military infrastructure has increased substantially over the last two years. Technologically, Russia wouldn't be ready

for that, but wouldn't China be better prepared? In a world of increasingly diffuse and hard to identify power and retaliation (Naim 2013; 2022) and with challenges that would demand cooperation efforts rather than conflict (Bremmer 2022), the challenges that arise in a conflict involving the US and China raise even more doubts not only in regards to the possible responses to a conflict on this scale, but also as to how the economy could split and deteriorate further in this context.

How does it look for Brazil in this possible scenario? Since we are not a part of any relevant global value chain (Baldwin 2016), we will depend on the countries that buy our commodities to continue buying them. The impact on Brazil of a crisis situation in Asia could be beneficial due to the potential for entry into a number of commodities, particularly agricultural ones, as was observed during the trade war under the Trump administration. Among other factors because the magnitude of trade with China is much greater than it is with Russia. From a diplomatic point of view, could it be a continuation of what was seen this year in the Ukraine war, when Brazil took a neutral stance, or could it be different because of the costs involved? The cost of Brazil remaining neutral would be much higher in the case of Western sanctions on China, because in all likelihood there would be secondary sanctions on Brazil. Brazil would have to choose between two losses in the case of Western sanctions on China: the loss of part of the Chinese market in the case of it partially adopting sanctions or a marked impact on its finances and foreign trade in the case of it rejecting the sanctions. The most likely response would be one in which Brazil would try to strike a delicate diplomatic balance between China and the US, but this would be extremely difficult. An acute confrontation (military and economic) between the West and China would put Brazil in a position where it would have to make much more difficult and risky foreign policy choices.

Conclusion

The Ukraine war has once again raised doubts regarding the effectiveness of economic sanctions, which were extensively studied in Mulder (2022a), particularly on major commodity-producing countries such as Russia. By affecting the commodities system in depth, particularly with regard to agricultural commodities and oil and gas, it has had an impact on inflation at a time when there were already strains due to the pandemic. To a certain extent, the Russians have experienced a lesser impact and the rest of the world has suffered an impact that had not been imagined. In countries where commodities have a lesser presence, this impact is less localized. This was the case, for example, of Italy in 1935, which suffered major embargoes, but which had little impact on the international price system, as the country was more of an importer than a producer of commodities.

The Chinese case is likely to be a challenge in the future. A possible involvement with Taiwan may not put pressure on the global commodity system, given that overall, the Chinese are more

consumers than producers. However, the Chinese response may take place via technology with retaliation that may occur in the export system of semiconductors and rare metals, of which China is an important producer and holds significant reserves. Unlike the case with Russia, initially the impact may be more deflationary than inflationary, as commodities have a direct impact on the price system by affecting the entire world chain. In the case of technology, some products may be affected, but it is easier to identify alternative sources of these products than it is to quickly identify sources of commodities such as natural gas and oil.

Additional consequences could entail a partial reversal of globalization, including a more pronounced division in global value chains between a Chinese nucleus and an American one. Furthermore, this would have a very pronounced impact on the already heavily affected multilateral bodies, such as the WTO and the UN. The experience of Italy in 1935, which caused the Germans and Japanese to prepare for a future embargo, may be an important example in our case, particularly as it terminally weakened the League of Nations. At that time the Japanese, but particularly the Germans, set out to verticalize whatever industrial production was possible in order to be less dependent on the world. And in a way, that is what the Chinese have been doing over the last few years. Of course, there is no comparison here between China and Germany in the political sense, but there is a trend towards Chinese isolation in an attempt for it to get away from the global cycles of high and low growth, a movement that clearly got underway after the Great Recession of 2008. This potentially more verticalized China increases the risk of a conflict with Taiwan on account of the duration and potential impact of economic sanctions against the Chinese.

Also, in line with what was seen in the US-China trade war, countries like Brazil that have strong economic ties with the Chinese could benefit to a partial extent. The war in the Ukraine produced more income for the agricultural sector, but also led to increased inflation. A China-Taiwan conflict could perhaps open up a longer-lasting space for commodity trade with the Chinese, but it could also have a much more pronounced effect on Brazil's finances and its international trade. The most negative aspect will be that once again Brazil will be supporting the undemocratic side of the conflict.

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